SPIRITUALITY AND MENTAL HEALTH: EXPLORING THE MEANINGS OF THE TERM 'SPIRITUAL'

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SPIRITUALITY AND MENTAL HEALTH: EXPLORING THE MEANINGS OF THE TERM 'SPIRITUAL'

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EDITORIAL
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Editorial: Spirituality and Mental Health: Exploring the Meanings of the Term "Spiritual"

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Editorial on the Research Topic

Spirituality and Mental Health: Exploring the Meanings of the Term "Spiritual"

Scientific studies have demonstrated positive and causal associations between spiritual well-being and good physical and mental health parameters in recent decades. Spiritual well-being has been shown to modulate neurovegetative functions, mainly through stress reduction (Saad et al., 2019; Peres et al., 2020). Furthermore, biological and psychological changes have been documented in acts of prayer, forgiveness, gratitude, contemplation, sacred rituals, and blessings (Blažević, 2021). Spiritual coping, or the use of faith-related practices and conceptions to deal with threatening situations positively, may be a valuable resource for well-being. On the other hand, spiritual struggles can aggravate stress and adversely affect patients' health.

Dimensions of spirituality in health care and research can also encompass the empirical study of spiritual and paranormal experiences, usually referred to as anomalous experiences in the academic literature. For example, studies of altered consciousness associated with mediumistic and spontaneous spiritual awakening experiences have important implications for the intersection between physiology, consciousness, and spirituality (Maraldi, 2021; Tressoldi et al., 2022). Near-death experiences are also intriguing phenomena that defy purely materialistic explanations.

Therefore, an awareness of the patient's spiritual values and experiences is paramount in providing high-standard healthcare training and clinical practice. However, health professionals and researchers addressing spiritual issues have the challenge of dealing with an enormous spectrum of spirituality and religious beliefs. The task is even more challenging because most health care courses do not prepare graduates in this field. Furthermore, professionals might be confronted by prejudiced behaviors and attitudes of colleagues or managers.

In addition, the term "spiritual" remains an open, fluid concept without a single, universally accepted definition across health care and research. More recently, additional secular forms of spiritual experiences have arisen from rationalistic and humanistic analytic thinking. For example, "spiritual-but-not-religious" is an increasingly popular self-designated faith affiliation (Saad and de Medeiros, 2020).

This Research Topic explored the intersection of various "spiritual" conceptions with health care and their resulting clinical implications. The collected material may interest practitioners or scholars involved in health or behavioral sciences. This topic aims not to find a one-size-fits-all solution for the many terminological issues in the field of spirituality but to expand the discussion and help advance awareness of the relevance and importance of spiritual dimensions in patient care. Such awareness may impact academic understanding, clinical practice, institutional programs, and government policies. The selection of articles invites us to reflect on the many interesting possibilities in the interface between spirituality and mental health.

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PAPERS ON CONCEPTUAL DEFINITIONS AND RESEARCH TOOLS

Sena et al. investigated the definitions of spirituality in the healthcare field, identifying its main dimensions after a systematic review of scientific journals. The authors constructed a framework representing spirituality as a quantifiable construct, and this framework may serve to increase understanding of this topic's complexity. Braghetta et al. developed a new scale to evaluate spirituality and then assessed its reliability and validity. The "Attitudes Related to Spirituality Scale" (ARES) proved to be a reliable, valid, and stable one-dimensional instrument for use in the Portuguese-speaking population and could be studied for validity in other cultures and languages.

PAPERS ON SPIRITUALITY-RELIGIOSITY RELATED TO PHYSICAL-MENTAL HEALTH AND WELLBEING

Rathakrishnan et al. studied the mediator role of spirituality in fear and mental health associated with the COVID-19 pandemic among Malay adults. The results demonstrated that individuals with a high level of spirituality were more likely to have a lower level of mental health…! Maulina et al. examined associations among affective state, somatosensory amplification, and spirituality in Japanese and Indonesian university students. Despite significant differences between the cultures in spiritual beliefs, spirituality was shown to play a role in somatic symptoms and positive affect in both cultures.

Leal et al. examined a frequently held perception in the psychological literature that hope for a miracle could have harmful consequences in health care. They used two examples to illustrate the relative absence of negative consequences in praying for a miracle and concluded that this practice could be recognized as openness to life, bolstering hope, and recognition of reality. In a subsequent paper of the same group, de Freitas et al. reviewed models better to understand the role of a belief in miracles and assess the impact of miracle belief on health parameters. The conceptual model presented provides a greater understanding of a patient's belief in a miracle, including its role in personal experiences and its impact on health care.

PAPERS ON SPIRITUALITY-BASED HEALTH INTERVENTIONS

Mossbridge et al. studied time perspective as having good thoughts about the past, awareness of present constraints, and adaptive planning for a positive future. They created a scalable time-travel narrative tool, the web application "Time Machine," to support people feeling connected to a wise and loving future version of themselves. Rabeyron proposed a clinical approach for counseling individuals who have experienced unusual spiritual experiences in a distressing context. The author presents a model of psychodynamic psychotherapy for anomalous experiences. Such a non-judgmental and open listening approach may replace this distressing experience by one that becomes integrated and transformative.

PAPERS ON SPIRITUAL-RELIGIOUS ISSUES IN HEALTHCARE SETTINGS

Cone and Giske conducted a study using a self-assessment survey tool to examine the spiritual care competencies of mental health staff in Norway and understand the perspectives of mental health staff in Scandinavian culture. Although small, the study revealed a need for spiritual care educational materials explicitly targeted at those who work in mental health. Borragini-Abuchaim et al. studied the opinion of undergraduate medical students at a national medical school in Brazil. The authors concluded that including topics of a spiritual dimension would be feasible. Result suggests that the dimension of patient spirituality/religious faith has already become a recognized component of contemporary medical care—see also Borragini-Abuchaim et al. for a corrigendum on the original paper.

PAPERS ON UNCOMMON RELIGIOUS-SPIRITUAL EXPERIENCES

Büssing studied "wondering awe," a perceptive aspect of spirituality relevant to religious and non-religious persons. High gratitude and awe scores were found more often in older subjects, those with the highest well-being, and those who meditate or pray frequently. "Wondering awe" was associated with many positive items of existential well-being. Corneille and Luke studied spontaneous spiritual awakenings (SSAs), the subjective experiences characterized by a sudden sense of contact, union, or experience of oneness with some ultimate reality, the universe, 'God,' or the divine. Temporal lobe lability and trait absorption (the tendency to have attention absorbed in a task) predicted these experiences.

Spindola-Rodrigues et al. evaluated the cognitive functioning of 19 spirit mediums who practice trance mediumship in Brazil. Neuropsychological tests showed that their cognitive functioning scores were equal to or higher than the median scores of Brazilians. Less experienced mediums, on the other hand, evidenced executive dysfunction and increased common mental disorders. Houran and Laythe tested the validity and practical utility of the "Haunted People Syndrome" concept (individuals who recurrently report various "supernatural" encounters). Authors conclude that the studied family's ordeal involved mental boundaries in the face of stressful circumstances, with histrionic and catastrophizing reactions.

AUTHOR CONTRIBUTIONS

MS, ED, and EM acted as Guest Editors of the thematic Research Topic. After they wrote together this Editorial, based on the collected papers. All authors contributed to the article and approved the submitted version.

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Spontaneous Spiritual Awakenings: Phenomenology, Altered States, Individual Differences, and Well-Being

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Spontaneous Spiritual Awakenings (SSAs) are subjective experiences characterised by a sudden sense of direct contact, union, or complete nondual merging (experience of oneness) with a perceived ultimate reality, the universe, "God," or the divine. These profound transformative experiences have scarcely been researched, despite extensive anecdotal evidence suggesting their potential to catalyse drastic, long-term, and often positive shifts in perception, world-view, and well-being. The aims of this study were to investigate the phenomenological variances of these experiences, including the potential differences between SSAs and Spontaneous Kundalini Awakenings (SKAs), a subset of awakening experiences that the authors postulate may produce a higher likelihood of both physical and negative effects; to explore how these experiences compare to other altered states of consciousness (ASCs), including those mediated by certain psychedelic substances; and understand their impact on well-being. Personality trait absorption and temporal lobe lability (TLL) were assessed as predictors of Spontaneous Spiritual and Kundalini Awakenings (SSA/SKAs). A mixed within and between-participants self-report survey design was adopted. A total of 152 participants reporting their most powerful SSA/SKAs completed questionnaires measuring nondual, kundalini, and mystical experience, as well as depth of ASC, and trait absorption and TLL. Spontaneous Kundalini Awakenings were found to be significantly more physical, but not significantly more negative than SSAs, and overall, both sets of experiences were perceived to be overwhelmingly more positive than negative, even in cases where the experience was initially challenging. The phenomenological distribution of SSA/SKAs was similar to other measured ASCs although greater in magnitude, and appeared most similar in distribution and in magnitude to drug-induced ASCs, particularly classic psychedelics DMT and psilocybin. Temporal lobe lability and trait absorption were found to predict the SSA/SKA experience. The limitations and implications of these findings are discussed.

Keywords: spirituality, mystical experience, altered states of consciousness, mental health, epilepsy, absorption, DMT, psilocybin

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INTRODUCTION

Spiritual awakening is a term given to describe a subjective experience in which an individual's ego transcends their ordinary, finite sense of self to encompass a wider, infinite sense of truth or reality. These deeply embodied, noetic experiences are often perceived as a direct connection, communion, or nondual merging with an unlimited and universal consciousness, the divine or "God" in perceived oneness (James, 1902/1985; Feuerstein, 1989; McClintock et al., 2016). Experiences of spiritual awakening, whether gradual or sudden, intentionally induced or spontaneous, typically evoke an ineffable sense of deep inner knowing, understanding, "remembering," or "unveiling" of one's true nature, as well as experiences of peace and equanimity, bliss, ecstasy and aliveness, feelings of awe, sacredness, gratitude and reverence, and of abundant, unconditional love (James, 1902/1985; Stace, 1960; Pahnke and Richards, 1966; Hood, 1975; Lukoff et al., 1995; Griffiths et al., 2006, 2008, 2011; Taylor, 2012; Taylor and Egeto-Szabo, 2017). These profound experiences may also trigger a sense of transcendence of time and space, as well as an increase in physical and mental sensitivity to internal and external stimuli, including sensitivity to colour, light, touch, sounds, and smells (Hood, 1975; Taylor and Egeto-Szabo, 2017; Woollacott et al., 2020). In some cases, they may be accompanied by strong physical sensations, as appears to be more typical in what are usually referred to as *kundalini* awakenings, including but not limited to: sensations of heat or energy rising or "shooting up" in the body, typically in and around the spine; bursts of tingling, tickling, prickling in the body, particularly around the crown of the head, brow-point, and heart-space; electric sensations in the extremities of body; perceived light emanating from the body, particularly from the head and heart; orgasmic sensations; disruptions in the digestive system; and spontaneous involuntary movements, including trembling or shaking, *asanas* (yogic postures) and *mudras* (hand postures) (Ring and Rosing, 1990; Greyson, 1993; Greenwell, 2002; Taylor, 2013, 2015; Woollacott et al., 2020). Occasionally, these sensory sensitivities may extend to paranormal-like experiences, with people reporting increased synchronicities, visions of an archetypal or symbolic nature, telepathic experiences, feeling spiritual presences, hearing sounds or voices not produced externally, and seeing things that are not materially present (Greyson, 1993, 2000; Thalbourne and Fox, 1999; Sovatsky, 2009; Taylor, 2015; Grof, 2019).

Experiences referred to as kundalini awakenings were first highlighted in the tantric and yogic scriptures of fifth and sixth centuries AD, namely the *Yogavasishtha, Yoga Kundalini Upanishad,* and *Hatha Yoga Pradipika* (Taylor and Egeto-Szabo, 2017). These experiences were considered powerful catalysts to awaken latent potential through the unification of the polarities of the mind (perceived duality), into oneness (perceived nonduality). As seen through the lens of these traditions and the lineages that have followed, kundalini energy lies dormant, coiled at the base of the spine until it is moved, or awakened. As it uncoils, the energy makes its way up the central *naadi* (subtle energy channels) adjacent to the spine: namely the *ida* (left channel) and the *pingala* (right channel), through the *shushumna* (central channel), piercing each *chakra* (energy point) as it reaches *sahasrara* (the crown of the head). The settling of this energy at the crown of the head is said to provoke experiences of spiritual ecstasy, or enlightenment (Taylor, 2013, 2015; Taylor and Egeto-Szabo, 2017; Woollacott et al., 2020). Whilst both terms are interchangeable and clearly overlap, kundalini awakenings are typically associated with greater physical and energetic symptoms than general spiritual awakenings (Sanches and Daniels, 2008; De Castro, 2015; Lockley, 2019).

Traditional texts from the tantra and yoga lineages, such as the *Paratrisika Vivarana* and *Yoga Kundalini Upanishad*, discuss the attainment of spiritual and kundalini awakenings through *asana* (yogic movements), *mudra* (hand postures), *pranayama* (breathwork and breath retention), *bandhas* (body locks), and the manipulation of the *ojas* (libido energy) through the act of *brahmacarya* (celibacy or chastity) (Mallinson, 2011; Sovatsky, 2014; Parker, 2018). While recent studies confirm the power of spiritual contemplative practices such as yoga, meditation, and mindfulness as catalysts for gradual and sudden states of awakening (De Castro, 2015; Taylor and Egeto-Szabo, 2017), these may also occur during sex (Wade, 2001, 2004), near-death experiences (Rivas et al., 2016), contact with nature (Terhaar, 2009; Taylor, 2012), as a result of homeostatic imbalance (e.g., from fasting, sleep deprivation, or intense athletic activity) (Parry et al., 2007; Murphy and White, 2011), and through the use of mind-altering substances, particularly of classic psychedelics (Johnson et al., 2019) such as psilocybin, lysergic acid diethylamide (LSD), and *N,N*-dimethyltryptamine (DMT) (Griffiths et al., 2006, 2008, 2011; MacLean et al., 2011; Lyvers and Meester, 2012), although they appear to most frequently emerge following periods of prolonged psychological turmoil or trauma, including loss, bereavement, and addiction (Miller and C'de Baca, 2001; Taylor, 2012; Taylor and Egeto-Szabo, 2017). However, whilst specific conditions, factors and/or triggers may pre-empt these experiences, these may also occur void of any apparent trigger, though this appears to be less frequent (Miller and C'de Baca, 2001; Taylor, 2012; Taylor and Egeto-Szabo, 2017). Awakening experiences do not appear, therefore, to be mediated by the subject's spiritual or religious context (Perry, 1974; Lukoff, 1985; Taylor, 2012), as is further illustrated by the responses of 1,509 American participants to a Gallup survey from 2002, to which a staggering 41%—projecting to 80 million American adults—fully identified with the statement "I have had a profound religious experience or awakening that changed the direction of my life," 25% of whom reported having no religious preference (Gallup, 2003). This response may also suggest that profound mystical experiences such as spiritual and kundalini awakenings might occur more frequently within the general population than generally considered (Lukoff, 1985).

Studies suggest that the peak duration of spiritual and kundalini awakenings is typically short, lasting from several

Abbreviations: ASC, altered states of consciousness; SKA, spontaneous kundalini awakening; SSA, spontaneous spiritual awakening; SSA/SKA, spontaneous spiritual awakening and spontaneous kundalini awakening; TLE, temporal lobe epilepsy; TLL, temporal lobe lability.

minutes to several hours, with traces lingering for a longer period (Marshall, 2005). However, the very nature of one of its prominent features, the transcendence of time and space, may make it challenging for participants to recall the exact duration of the peak of their experiences. Whether long or short in peak duration, these intense psychological shifts in consciousness often lead to long-lasting and even permanent changes to the subject's sense of self and of the world around them (Neumann and Campbell, 1964; Taylor and Egeto-Szabo, 2017), often from an experience of fragmentation of purpose and meaning, to loving engagement with life (Dunnington, 2011). These experiences are therefore considered deeply healing. Some of the cognitive and behavioural shifts linked to these experiences include: increased empathy, compassion, gratitude, openness, trust, altruism, curiosity, awareness, creativity, authenticity, integrity, a sense of higher purpose and meaning in life, a sense of virtuous mission or selfless service towards humanity, a sense of being reborn and liberated from past attitudes and beliefs, a sense of devotion to love-based values, and a rejection of "religiousness" and materialistic lifestyles (Cook, 2004; McClintock et al., 2016; Taylor and Egeto-Szabo, 2017; McGee, 2020). These deep shifts may lead to radical changes in religious and philosophical views, relationships, and career paths (Taylor and Egeto-Szabo, 2017).

Spirituality may act as a buffer against stress and improves coping against the depressive effects of stressful events (Kendler et al., 1997), promoting positivity, equanimity, optimism, peace, and resilience (Grodzicki and Galanter, 2006; Brown et al., 2013). It is perhaps unsurprising, therefore, that spiritual and kundalini awakenings are associated with a wealth of sustained positive therapeutic outcomes, such as a decreased risk of committing suicide among suicidal individuals following their experience (Horton, 1973). Psilocybin-occasioned mystical experiences have been linked to sustained improvements in treatment-resistant depression (Carhart-Harris et al., 2016), and significant reductions in anxiety, hopelessness, and fear of death in patients with life-threatening cancer (Griffiths et al., 2016; Ross et al., 2016). Both psilocybin-occasioned mystical experiences and spiritual or kundalini awakenings attained without the use of drugs have been linked to persisting positive effects in the treatment of treatment-resistant alcohol and tobacco addiction (Green et al., 1998; Galanter et al., 2007; Strobbe et al., 2013; Garcia-Romeu et al., 2014), with several studies indicating a 3 to 4-fold increase in abstinence from addiction following spiritual awakening (Green et al., 1998; Kaskutas et al., 2003; Galanter et al., 2013). The very basis of the Alcoholics Anonymous programme lies in spiritual attainment, or awakening (Khouzam and Kissmeyer, 1997; Galanter, 2008; Strobbe et al., 2013)—even Jung proposed that spiritual awakening may enable healing from addiction (Allamani et al., 2013). Furthermore, these experiences may lead to an increased interest in spiritual based lifestyles associated with improved positive identity, positive coping, problem solving, and integrity (Taylor, 2012, Woollacott et al., 2020), which in turn have been linked to a decrease of psychopathological tendencies (McClintock et al., 2016).

In some cases, spiritual and kundalini awakenings trigger challenging short or long-term sensory, affective, cognitive, and physical effects (Neumann and Campbell, 1964; Grof and Grof, 2017; Woollacott et al., 2020) such as, but not limited to: panic, disorganised thoughts and behaviours, persistent involuntary movements of the body, uncomfortable sensations of heat and burning in the body, digestive problems, and challenging extrasensory-like experiences (Greyson, 1993; Taylor, 2015; Grof and Grof, 2017; Woollacott et al., 2020)—additionally, these experiences have been linked to a better performance in psi tasks involving precognition (Storm and Goretzki, 2020). Distressing awakening experiences, also known as *spiritual emergencies* or crises, may arise as a direct consequence of the initial experience, when an individual is left feeling overwhelmed, confused, or challenged by the drastic perceptual shifts that tend to emerge from these experiences, and by their potentially powerful energetic nature. Spiritual emergencies may also occur during the integration period following an awakening experience (Grof and Grof, 2017), as the subject finds themself stripped of all pre-existing beliefs and concepts of life without an appropriate framework through which to interpret their newly-gained insight, and often without an appropriate support system to which they can turn (Lukoff and Everest, 1985). Because of this, it is assumed that spiritual emergencies may more frequently occur in cases of sudden or *spontaneous* awakening (St Arnaud and Cormier, 2017), and outside of a religious or spiritual context (Taylor, 2013). However blissful initially, the experience of deep psychological change catalysed by spiritual or kundalini awakenings may provoke distress leading to spiritual emergency, which psychiatrists are likely to diagnose as acute psychotic experience indicative of psychopathology (Menezes and Moreira-Almeida, 2010; Grof and Grof, 2017).

Parallels have been drawn between spiritual and kundalini awakenings and psychopathologies such as bipolar disorder and schizophrenia (Lukoff, 1985; Oxman et al., 1988; Johnson and Friedman, 2008) both by psychiatrists (Menezes and Moreira-Almeida, 2010) and transpersonal psychologists (Lukoff, 1985; Lukoff et al., 1998; Grof and Grof, 2017), though attempts have been made to separate both sets of experiences. Recent studies observing the differences and similarities between spiritual emergency [using the Spiritual Emergency Scale (SES); Goretzki et al., 2009, 2014], and psychosis, have found spiritual emergency to diverge significantly from psychosis in alogia (Bronn and McIlwain, 2015; Storm and Goretzki, 2021), and in depression, anxiety, and stress (Bronn and McIlwain, 2015). Thus, while overlaps are considerable, spiritual and kundalini awakenings (including spiritual emergencies) are generally understood to not be indicative of psychopathology, even if they may be psychologically challenging at times (Goretzki et al., 2009, 2014; Bronn and McIlwain, 2015; St Arnaud and Cormier, 2017). A multicultural approach to understanding spiritual experiences and their effects culminated in addition of the *Religious or Spiritual Problem* diagnostic category (American Psychiatric Association, 1994, 2013) in the fourth edition of the Diagnostic and Statistical Manual. While spiritual and kundalini awakenings are no longer considered psychopathological by default (Johnson and Friedman, 2008; Menezes and Moreira-Almeida, 2010), the accurate diagnosis of experiences falling under the *Religious or Spiritual Problem* category remains challenging, partly because

still too little is known about spiritual experiences and how these interact, interlink, or overlap with psychopathology, and partly due to a lack of spiritually-informed clinicians who have a bias towards the pathologisation of extreme anomalous experiences (Menezes and Moreira-Almeida, 2010; Parnas and Henriksen, 2016). As a result, the conventional psychiatric model is still overwhelmingly more likely to interpret potentially healing spiritual experiences as nothing more than mere psychopathology (St Arnaud and Cormier, 2017). This lack of understanding on behalf of clinicians remains problematic both for patients undergoing psychotic states with mystical features (which may be indicative of psychopathology), and patients undergoing non-pathological, though potentially distressing, spiritual or kundalini awakenings (which may be indicative of spiritual emergency) (Lukoff, 1985). An inappropriate treatment of either group may result in harm (Johnson and Friedman, 2008; Grof and Grof, 2017), and may trigger negative symptoms in positively perceived awakening experiences, or intensify the negative symptoms of spiritual emergency (Turner et al., 1995; Whitney, 1998). Either circumstance is likely to leave the individual in a state of trauma (Bragdon, 2006).

Spiritual experiences have been linked to temporal lobe epilepsy (TLE) (Naito and Matsui, 1988; Hansen and Brodtkorb, 2003; Özkara et al., 2004; Giovagnoli et al., 2006; Devinsky and Lai, 2008), with individuals experiencing auras of a spiritual nature, such as *autoscopy* (the experience of seeing oneself in the form of one's double, or through the lens of an out of body experience) (Devinsky et al., 1989), clairvoyance and telepathy (Özkara et al., 2004), déjà vu (Guedj et al., 2010), visual and auditory hallucinations of a religious or archetypal/symbolic nature, and the repetition of religious phrases (Hansen and Brodtkorb, 2003), during seizures (*ictally*) (Kanemoto, 1994; Ogata and Miyakawa, 1998), and after seizures (*postictally*) (Geschwind et al., 1980; Roberts and Guberman, 1989). Some of the common features of spiritual and kundalini awakenings have also been reported by TLE experiencers, including strong sensations of a cosmic, divine, or "God-like" presence or energy, and a sense of being connected with the infinite (oneness) (Zohar and Marshall, 2000; Hyde, 2004; Dolgoff-Kaspar et al., 2011). The partial seizure-like symptoms characteristic of TLE, namely temporal lobe *lability* (TLL), have therefore been used as a predictor measure for drug and non-drug induced altered states of consciousness (ASCs). Recent studies have indicated the links between TLL and mystical experiences occasioned by drug and non-drug induced ASCs (Luke et al., 2018, 2019). The potential links between TLL and spiritual and kundalini awakenings therefore warrants further exploration.

Personality trait absorption measures the depth to which one's attentional and experiential involvement occurs in relation to internal or external stimuli without effort or control (Tellegen and Atkinson, 1974), and has been used to measure proclivity for ASCs (Hunt, 2000; Luhrmann, 2017; Lifshitz et al., 2019). It has been found to be a good predictor of altered states produced by psychedelic substances (Haijen et al., 2018) such as psilocybin (Studerus et al., 2012; Studerus, 2013), LSD (Carhart-Harris et al., 2015; Terhune et al., 2016), MDMA (Hastings, 2006), ayahuasca (Bresnick and Levin, 2006), and ayahuasca's active ingredient, DMT (Timmermann et al., 2018). It is also a good predictor of mystical and quasi-mystical experiences produced endogenously in contexts such as the anechoic dark room (Luke et al., 2018), the whole-body perceptual deprivation tank (WBPD; Glicksohn and Ben-Soussan, 2020), and during guided "shamanic journey" visualisation (Rock, 2009). Traditionally, the trait has been associated with "fantasy proneness," hypnotisability, imagery ability, openness to experiences (McCrae and Costa, 1983; Pekala et al., 1985; Roche and McConkey, 1990; Glisky et al., 1991), alterations in body image, time-space perception, and meaning (Pekala et al., 1985; Kumar and Pekala, 1988), higher emotional sensitivity and emotional brain processing (McCrae and Costa, 1983; Benning et al., 2015), stronger empathy (Wickramasekera and Szlyk, 2003; Wickramasekera, 2007), stronger flow states (Marty-Dugas and Smilek, 2019), intellectual curiosity (McCrae and Costa, 1983), more pronounced creativity and engagement in the arts (Wild et al., 1995; Manmiller et al., 2005), positive emotional responses to music (Rhodes et al., 1988), more pronounced experiences of synaesthesia (Rader and Tellegen, 1987; Glicksohn et al., 1999; Chun and Hupé, 2016), and an attachment to nature and other forms of life (Kaplan, 1995; Brown and Katcher, 1997), relative to the general population. The trait of absorption has also been associated with experiences of dissociation (Carleton et al., 2010), hallucinations (Glicksohn and Barrett, 2003; Glicksohn, 2004; Perona-Garcelán et al., 2013, 2016), and paranormal beliefs or experiences (Glicksohn, 1990, 2004; Spanos et al., 1993; Glicksohn and Barrett, 2003; French et al., 2008; Parra, 2008; Zingrone et al., 2009; Luhrmann et al., 2010, 2021; Gray and Gallo, 2016; Parra and Gimenez Amarilla, 2016), such as hearing voices or feeling spiritual presences (Granqvist et al., 2005; Luhrmann et al., 2010, 2021), and feelings of self-transcendence (Cardeña and Terhune, 2014). Absorption is associated with porosity, the degree to which one identifies the outside world and its events as permeable with the inner world (Luhrmann et al., 2021); and transliminality, the subconscious tendency for internal or external material to "cross the threshold of consciousness" (Lange et al., 2000; Houran et al., 2003). Deeper states of absorption can be cultivated through ritual, including communal repetitive behaviours such as chanting or drumming, meditation (Bronkhorst, 2016), prayer (Luhrmann et al., 2010), and the disruption of homeostatic balance, including through the ingestion of certain psychotropic substances (Bronkhorst, 2016).

Studies investigating the phenomenology of mystical experiences produced by certain drugs such as strong psychedelic compounds psilocybin and DMT, their therapeutic potential, and long-term impacts on well-being (e.g., Carhart-Harris et al., 2012a,b, 2016; Garcia-Romeu et al., 2014; Griffiths et al., 2016; Ross et al., 2016; Noorani et al., 2018), suggest close similarities with spontaneously occurring spiritual and kundalini awakenings, however, little research has been conducted on the latter. Furthermore, comparisons between the phenomenological distributions of various measured drug and non-drug induced ASCs have revealed strong phenomenological similarities between both sets of ASCs, as well as similar predictors of the experiences (Luke et al., 2019), including TLL and trait absorption, suggesting the potential for some

of these same measures to be applied to study spiritual and kundalini awakenings.

Psychological research on spiritual and kundalini awakenings is still in its infancy and has tended not to focus on experiences of a sudden, spontaneous nature. Studies investigating the impact of mystical experiences similar to spiritual and kundalini awakenings, on well-being, have recognised the predominantly positive, healing effects of these experiences, but have also acknowledged some of the more challenging aspects brought on both by their disruptive nature and by their typically biased clinical interpretations. The subtle phenomenological differences between spiritual awakenings and kundalini awakenings have seldom been explored, despite a greater number of studies addressing the strong physical nature of kundalini awakenings, compared to spiritual awakenings. The interchangeable use of these terms could be problematic in the interpretation of these experiences and of their outcomes, especially as stronger physical experiences may equate to more challenging outcomes. Neuroscientific and psychological research has explored some of the phenomenological and neurobiological underpinnings of drug and non-drug induced ASCs, and has explored the links between the spiritual characteristics of ASCs and the symptoms of TLE and of trait absorption. However, Spontaneous Spiritual and Kundalini Awakenings (SSA/SKAs) have not yet been mapped within the ASC framework, nor have the typical predictors used to study ASCs (TLL and absorption) been analysed as effective predictors of SSA/SKAs.

This paper will aim to address some of the gaps in the literature by exploring the general characteristics of SSA/SKAs, their implications on well-being, how they compare to other measured ASCs, their relationships with TLL and absorption, and the potential phenomenological differences between them. Given the prominence of anecdotal recounts of physical and energetic experiences preceding challenging kundalini experiences, the authors hypothesise not only that Spontaneous Kundalini Awakenings (SKAs) are more physical than Spontaneous Spiritual Awakenings (SSAs), but that they are also more likely to produce negative experiences. Spontaneous Spiritual and Kundalini Awakenings will subsequently be mapped within the ASC framework by comparing their phenomenological distribution against a backdrop of non-drug and drug-induced ASCs. Analysis will then be conducted to test the hypothesis that TLL and trait absorption predict the intensity of the SSA/SKA ASC, following similar protocol for the study of induced ASCs. Further analysis will be conducted to understand how the population distribution of the SSA/SKA sample compares with the distribution of the published "normal" samples for TLL and absorption. The short and long-term well-being impacts of these experiences will be explored.

METHODOLOGY

Design

A quantitative, mixed within and between-participants self-report survey design was adopted. There were four outcome variables: intensity of SSA/SKA experiences, measured with the Nondual Embodiment Thematic Inventory (NETI), the Kundalini Awakening Scale (KAS), and the 30-item Mystical Experience Questionnaire (MEQ30); and depth of ASC, measured with the 11-Dimensional Altered States of Consciousness Rating Scale (11D-ASC). There were two predictor variables: TLL, measured with the Iowa Interview for Partial Seizure-like Symptoms (IIPSS); and trait absorption, measured with the Modified Tellegen Absorption Scale (MODTAS). Statistical analysis was performed using IBM SPSS Statistics.

Participants

Participants were recruited to take part in the survey through social media. The experience was described as follows: "Have you ever had a strong experience of a profound spiritual nature in which you suddenly and non-intentionally felt in contact, or communion with something that is considered to be an ultimate reality, 'God', or the divine? Have you ever felt that your ego suddenly transcended beyond an ordinary personal identity in space and time, and that you became 'one' with the universe?" All participants were aged over 18 and must have experienced SSA/SKA at least once in their lives. Participants who had experienced SSA/SKA under the influence of psychoactive drugs were excluded. Participation was voluntary.

A total of 153 respondents completed the survey but one was excluded as their experience was mediated by psychedelic substance use, so only data from 152 participants were analysed. Of these, 55.3% identified as female, 42.8% as male, 1.3% as non-binary, and 0.7% as other. Ages ranged from 18 to 69 years ($N = 144$, $M = 41.09$ years, $SD = 11.60$ years). Reported ethnicity was 74.3% white, 11.8% mixed/multiple ethnic groups, 9.2% Asian or Asian British, 0.7 black/African/Caribbean black British, and 3.9% other. The participants' reported religious/spiritual belief was 63.2% spiritual but not religious, 5.3% Christian, 5.3% Hindu, 2.6% Agnostic, 2% Buddhist, 2% Muslim, 1.3% Atheist, 0.7% Jewish, and 17.8% other, of which 2% identified as Omnist. Seventy-three percent of participants reported having experienced more than one SSA and/or SKA in their lives, vs. 27% having experienced it just once.

Ethical Considerations

Full ethical approval was granted for the study by the University of Greenwich Departmental Research Ethics Committee, which conformed both to British Psychological Society (BPS) guidelines and to GDPR standards. The study was not expected to involve any obvious risks to physical or mental health and helplines were provided in this unlikely event. Participants were fully briefed before consenting and debriefed upon submitting. Participants were advised that they could omit to answering any question they may not have wished to answer, and of their freedom to withdraw from the study at any time. Participants were also advised of their right to withdraw their data from the study at any point until data processing. Participants were made aware that data would be kept on a password-secured computer, and that any publication would ensure strict anonymity.

Measures

The Nondual Embodiment Thematic Inventory

The Nondual Embodiment Thematic Inventory (NETI; Butlein, 2005), is a 20-item unitary scale, developed to measure the qualities of spiritual awakening and nondual experiences. Scoring is on a 5-point Likert-type scale, from 1 (never) to 5 (all of the time). Items 4, 8, 14, and 16 were reversed scored. Total scores range from 20 to 100. Cronbach's alpha for the scale is 0.91, indicating high internal consistency since $\alpha > 0.70$, the accepted cut-off point for high internal consistency as indicated by Mills et al. (2018). Cronbach's alpha indicates good internal consistency across the whole scale for the SSA/SKA sample ($N = 152$), since $\alpha = 0.87$, in line with previously published figures. Construct validity was also observed (Mills et al., 2018).

The Kundalini Awakening Scale

The Kundalini Awakening Scale (KAS; Sanches and Daniels, 2008), is a 76-item scale, developed to measure the effects of kundalini awakening experiences. The measure is composed of five subscales: changes (15 items); involuntary positionings (3 items); physical symptoms (20 items); negative experiences (12 items); and positive experiences (9 items). Scoring is on a 7-point Likert-type scale, from 1 (strongly disagree) to 7 (strongly agree). Total scores range from 76 to 532. Reported Cronbach's alpha for the whole scale is 0.98, indicating high internal consistency (Sanches and Daniels, 2008). Cronbach's alpha scores indicate good internal consistency across all subscales for the SSA/SKA sample ($N = 152$) (changes: $\alpha = 0.86$; involuntary positionings: $\alpha = 0.80$; physical symptoms: $\alpha = 0.92$; negative symptoms: $\alpha = 0.86$; positive symptoms: $\alpha = 0.80$), in line with previously published figures. Figures are unavailable for construct validity.

The 30-Item Mystical Experience Questionnaire

The 30-Item Mystical Experience Questionnaire (MEQ30; MacLean et al., 2012), is a 30-item scale, developed to measure the intensity of mystical experiences. The measure is composed of four subscales: mystical (15 items); positive mood (6 items); transcendence of time and space (6 items); ineffability (3 items). Scoring is on a 6-point Likert-type scale, from 0 (none) to 5 (extreme). Total scores range from 0 to 150, with a cut-off indicating "complete mystical experience" when total scores on each four subscales $\geq$60%. High internal consistency is reported for the whole scale ($\alpha = 0.93$), and subscales ($\alpha = 0.93$; $\alpha = 0.83$; $\alpha = 0.81$; $\alpha = 0.80$, respectively) (MacLean et al., 2012). Cronbach's alpha scores indicate higher internal consistency across all subscales for the SSA/SKA sample ($N = 152$) (mystical: $\alpha = 0.94$; positive mood: $\alpha = 0.86$; transcendence of time and space: $\alpha = 0.88$; ineffability: $\alpha = 0.85$), in line with previously published figures. The measure has been validated for psychedelic-induced experiences and construct validity was also observed (MacLean et al., 2012).

The 11-Dimensional Altered States of Consciousness Rating Scale

The 11-Dimensional Altered States of Consciousness Rating Scale (11D-ASC; Studerus et al., 2010), is a 42-item scale, developed from the 94-item 5-Dimensional Altered States of Consciousness Rating Scale (5D-ASC) (Dittrich, 1998) to measure the intensity of ASCs. The measure is composed of 11 subscales: experience of unity (5 items); spiritual experience (3 items); blissful state (3 items); insightfulness (3 items); disembodiment (3 items); impaired control and cognition (7 items); anxiety (6 items); complex imagery (3 items); elementary imagery (3 items); audio-visual synaesthesia (3 items); changed meaning of percepts (3 items). The continuous rating scale runs from 0 (no, not more than usually) to 10 (yes, much more than usually), and item scores from the SSA/SKA sample were standardised to 0 to 100 (percentage), giving total scores ranging from 0 to 4,200. High internal consistency can be observed across each subscale ($\alpha = 0.88$; $\alpha = 0.77$; $\alpha = 0.82$; $\alpha = 0.73$; $\alpha = 0.82$; $\alpha = 0.85$; $\alpha = 0.89$; $\alpha = 0.80$; $\alpha = 0.84$; $\alpha = 0.91$; $\alpha = 0.79$, respectively) (Studerus et al., 2010). Cronbach's alpha indicates good internal consistency scores across most subscales in the SSA/SKA sample ($N = 152$), apart from three subscales, which showed somewhat lower internal consistency than previously published figures [experience of unity: $\alpha = 0.89$; spiritual experience: $\alpha = 0.57$ (3 items: $\alpha < 0.70$); blissful state: $\alpha = 0.86$; insightfulness: $\alpha = 0.66$ (3 items: $\alpha < 0.70$); disembodiment: $\alpha = 0.84$; impaired control and cognition: $\alpha = 0.82$; anxiety: $\alpha = 0.87$; complex imagery: $\alpha = 0.55$ (3 items: $\alpha < 0.70$); elementary imagery: $\alpha = 0.88$; audio-visual synaesthesia: $\alpha = 0.87$; changed meaning of percepts: $\alpha = 0.76$]. Figures are unavailable for construct validity.

The Modified Tellegen Absorption Scale

The Modified Tellegen Absorption Scale (MODTAS; Jamieson, 2005), is a 34-item scale, developed from the Tellegen Absorption Scale (TAS) (Tellegen and Atkinson, 1974) to measure states of absorption, the tendency to have one's attention absorbed in a task or stimulus. This measure has been shown to predict depth of non-ordinary states of consciousness. The measure is composed of five subscales: synaesthesia (4 items); ASC (4 items); aesthetic involvement in nature (5 items); imaginative involvement (9 items); ESP (3 items). Scoring is on a 5-point Likert-type scale, from 0 (never) to 4 (very often). Total scores range from 0 to 136. Recent studies indicate good internal consistency [e.g., Cronbach's α 0.96 (Terhune et al., 2016) and 0.94–0.95 (Andrei et al., 2016)]. Cronbach's alpha scores indicate good internal consistency across all subscales for the SSA/SKA sample ($N = 152$) [synaesthesia: $\alpha = 0.83$; ASC: $\alpha = 0.69$ (4 items: $\alpha < 0.70$); aesthetic involvement in nature: $\alpha = 0.78$; imaginative involvement: $\alpha = 0.81$; ESP: $\alpha = 0.77$]. Figures are unavailable for construct validity.

The Iowa Interview for Partial Seizure-Like Symptoms

The Iowa Interview for Partial Seizure-Like Symptoms (IIPSS; Roberts, 1999), is a 40-item scale, developed to measure different cognitive, affective, and sensory symptoms that may be indicative of epileptiform disturbances of the temporal lobe. The scale has been used to help identify partial seizure-like symptoms, characteristic of TLE. The measure is composed of four subscales: sensory; cognitive; affective; nocturnal, but has been used as a unitary scale for the purpose of this study. Scoring is on a 7-point Likert-type scale, from 0 (never, or not in the past year) to 6 (more

than once a day), besides item 31, which is a dichotomous yes/no question, and is thus scored as either 0 or 6. Total scores range from 0 to 240. No published figures are available for internal consistency or construct validity.

Additional questions were asked to understand whether SSA/SKA experiences were considered predominantly positive or negative in the short and long-terms.

Procedure

The survey was dispersed on social media (e.g., Facebook), where participants were recruited and directed to a survey link. All data was collected using Qualtrics survey software. Upon consenting, participants were invited to take part in the survey, which took approximately 45 min to complete. For the sake of consistency and to measure most powerful awakening experience, participants were asked to recall and focus on their one most powerful SSA or SKA for the rest of the survey, even if they had experienced multiple SSAs and/or SKAs during the course of their lives. Participants were asked to report their choice of either an SSA or SKA according to their subjective interpretation. The item, which was positioned in the first part of the survey (demographics section), read: "For the remainder of the survey, please consider only your most powerful SSA or SKA, if you've experienced more than one. Please specify how you would classify the experience you will be referring to" (as either SSA or SKA). Upon completion, participants were debriefed.

RESULTS

Of all participants, 60.5% chose to recall their most powerful SSA and 39.5% chose to recall their most powerful SKA. The age of onset for participants' most powerful SSA/SKA ranged from "10 years or less" to 67 years ($N = 148$, $M = 32.78$ years, $SD = 10.60$ years). Of all participants, 21.1% responded that the peak of their experience lasted minutes, 10.5% hours, 7.9% days, 9.2% weeks, 14.5% months, 7.9% years, and 28.9% responded that the peak of their experience was still ongoing.

Responding to the multiple choice question: "Considering your most powerful SSA or SKA, do you think there were any significant factors that led you to have this experience," 52% reported psychological turmoil/trauma (e.g., stress, depression, loss, bereavement, combat, addiction), 47.4% meditation practice, 31.6% spiritual literature, 21.7% contact with nature, 21.7% past use of psychedelics or entheogens, 18.4% yoga practice, 13.2% near-death experience, 11.8% breathwork (e.g., Wim Hof method, Holotropic Breathwork, pranayama), 11.2% sacred sexual intimacy, 9.9% fasting, 9.2% no discernible trigger that they were aware of, 9.2% physical injury, 8.6% lucid dreaming, 8.6% sleep deprivation, 7.9% athletic activity, and 39.9% "other" factors.

For regularly practised activities *before* the onset of participants' most powerful SSA/SKA, contact with nature was the most reported activity (68.4%) and Kundalini Yoga was the least reported activity (11.2%). For regularly practised activities *after* participants' most powerful SSA/SKA, meditation was the most reported activity (79.6%) and "other yoga" was the least reported activity (21.1%) (**Table 1**). An average increase was observed across all activities post-SSA/SKA, with the exception of the use of psychedelics and entheogens, where a small decrease was observed (**Table 1**).

TABLE 1 | Reported regularly practised activities before and after the participants' most powerful SSA/SKA.

Regularly practised activities	Before (% of sample)	After (% of sample)	Difference (% of sample)
Contact with nature	68.4	74.3	5.9
Spiritual literature	58.6	75	16.4
Mindfulness	55.9	73.7	17.8
Meditation	54.6	79.6	25
Lucid dreaming	37.5	49.3	11.8
Athletic activity	34.9	40.1	5.2
Psychedelics/ Entheogens	30.3	26.3	−4
Breathwork	28.3	53.9	25.6
Fasting	27	31.6	4.6
Sleep deprivation	23.7	26.3	2.6
Other yoga	22.4	29.6	7.2
Hatha yoga	19.1	24.3	5.2
Sacred sexual intimacy	18.4	34.9	16.5
Other	15.8	21.1	5.3
Tantra	12.5	21.7	9.2
Kundalini yoga	11.2	24.3	13.2

Of all participants, 83.6% reported that "practising these activities following the onset of their most powerful SSA/SKA" helped them manage the experience, 6.6% reported that they did not affect the management of their experience, 2.6% reported that they worsened their experience, 6.6% reported that the question did not apply, and 0.7% chose not to disclose their answer.

SSA/SKA IIPSS Scores Compared to Published "Normal" Population

Spontaneous Spiritual and Kundalini Awakenings IIPSS scores measuring TLL symptoms ($N = 148$) were compared to scores from the published "normal" population ($N = 115$) (Roberts, 1999). **Figure 1** shows the histogram of both score distributions, which reveals that mean scores from the SSA/SKA sample were higher than those from the "normal" population, the largest differences being present in the high score range. A significantly large proportion of our participants scored very high (>50), whereas very few people scored as highly in the "normal" population (**Figure 1**), suggesting more pronounced TLL traits in our participants [$\chi^2_{(1)} = 40.16$, $p < 0.001$].

SSA/SKA MODTAS Scores Compared to Published "Normal" Population

Spontaneous Spiritual and Kundalini Awakenings MODTAS mean subscale scores measuring trait absorption ($N = 152$) were compared to mean subscale scores from the published "normal" population ($N = 352$) (Jamieson, 2005). Scores from both groups were relatively similarly distributed, with the exception of the ASC subscale in the SSA/SKA group, where the mean score was

more than double that of the "normal" population (SSA/SKA: $M = 2.54$; Norms: $M = 1.16$) (**Figure 2**). Scores for items 8 "I think I really know what some people mean when they talk about mystical experiences" and 9 "I can step outside my usual self and experience an entirely different state of being," belonging to the ASC subscale, were more than double those of the "normal" population.

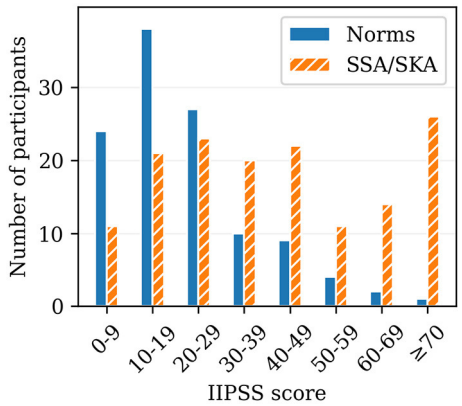

FIGURE 1 | Histogram indicating score distribution of the Iowa Interview for Partial Seizure-like Symptoms (IIPSS; Roberts, 1999) for the previously published "normal" population (Norms; $N = 115$; Roberts, 1999) and for the participants of this study (SSA/SKA; $N = 148$).

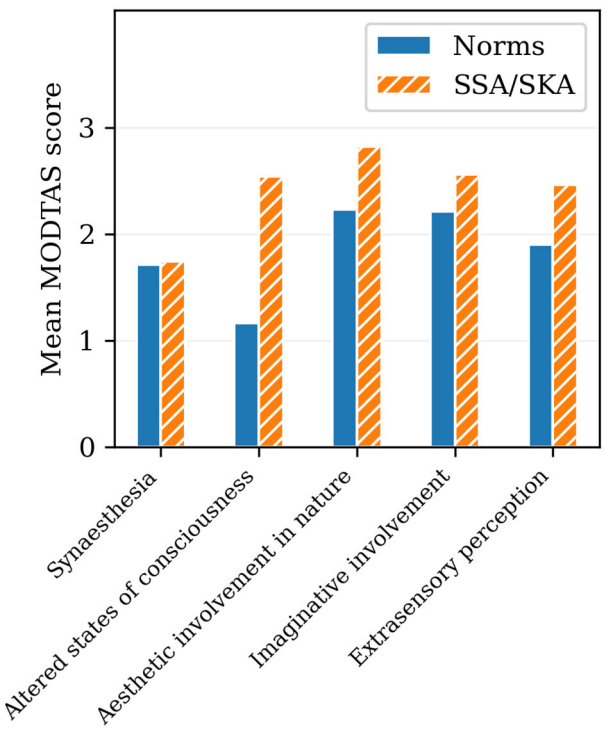

FIGURE 2 | Bar chart comparing the mean subscale scores of the Modified Tellegen Absorption Scale (MODTAS; Jamieson, 2005) for the published "normal" population (Norms; $N = 352$; Jamieson, 2005) and for the participants of this study (SSA/SKA; $N = 152$).

The Characteristics of SSA/SKA Experiences

NETI Scores

Fifteen out of 20 items scored higher than 3, indicating general agreement with their corresponding statements. The highest scoring item was "An interest in clearly seeing the reality or truth about myself, the world, and others, rather than in feeling a particular way" ($M = 4.51$, $SD = 0.72$), and the lowest scoring item was "A sense of fear or anxiety that inhibits my actions" ($M = 2.26$, $SD = 1.06$) (**Table 2**). The four items relating to negative experience (4, 8, 14, and 16) scored the lowest (when reversed scoring was not applied). Mean scores for each item are reported in **Table 2**.

TABLE 2 | Highest to lowest mean scores of the 20-item Nondual Embodiment Thematic Inventory (NETI; Butlein, 2005), relating to the phenomenological features of SSA/SKA ($N = 152$).

Items	*M*	*SD*
An interest in clearly seeing the reality or truth about myself, the world, and others, rather than in feeling a particular way.	4.51	0.72
Feelings of gratitude and/or open curiosity about all experiences.	4.35	0.85
Deep love and appreciation for everyone and everything I encountered in life.	4.23	0.84
Understanding that there is ultimately no separation between what I call my "self" and the whole of existence.	4.22	0.97
A sense of the flawlessness and beauty of everything and everyone, just as they are.	4.20	0.92
A sense of immense freedom and possibility in my moment-to-moment experience.	4.13	0.97
Conscious awareness of my non-separation from (essential oneness with) a transcendent reality, source, higher power, spirit, god, etc.	4.13	1.05
A feeling of profound aliveness and vitality.	4.11	0.86
Accepting (not struggling with) whatever experience I may have been having.	3.97	0.99
An inner contentment that was not contingent or dependent upon circumstances, objects, or the actions of other people.	3.93	1.12
An unwavering awareness of a stillness/quietness, even in the midst of movement and noise.	3.87	0.98
Feeling deeply at ease, wherever I was or whatever situation or circumstance I may have found myself in.	3.87	1.05
Acting without assuming a role or identity based on my own or others' expectations.	3.78	1.07
Acting without a desire to change anybody or anything.	3.70	1.13
Not being personally invested in, or attached to, my own ideas, and concepts.	3.48	1.14
A desire to be understood by others.	2.85	1.21
A sense that my actions in life were motivated by fear or mistrust.	2.74	1.22
A sense that I was protecting or defending a self-image or concept I held about myself.	2.54	1.22
Concern or discomfort about either the past or future.	2.38	1.11
A sense of fear or anxiety that inhibited my actions.	2.26	1.06

KAS Scores

The highest scoring subscale was changes ($M = 5.80$, $SD = 0.84$), followed by positive experiences ($M = 5.48$, $SD = 1.07$), physical symptoms ($M = 4.20$, $SD = 1.30$), negative experiences ($M = 4.11$, $SD = 1.32$), and involuntary positionings ($M = 4.01$, $SD = 1.87$). Results for the ten highest and ten lowest scoring items are reported in **Tables 3A,B**, respectively. The detailed results for all 76 items are provided in the **Supplementary Material**.

MEQ30 Scores

Ineffability ($M = 4.29$, $SD = 0.95$) was found to be the highest scoring subscale, followed by positive mood ($M = 4.17$, $SD = 0.87$), mystical ($M = 4.10$, $SD = 0.94$), and transcendence of time and space ($M = 3.44$, $SD = 1.23$). Only one item's mean score, "Loss of usual awareness of where you were" (item 11), fell beneath 3 ($M = 2.76$, $SD = 1.72$), indicating general disagreement with the statement. A full breakdown of MEQ30 item scores is listed in the **Supplementary Material**. The number of participants having experienced a complete mystical experience was then calculated by selecting total subscale means equal or greater than the cut-off score of 3 (60%), the threshold for a complete mystical experience (MacLean et al., 2012). Of all participants, 63.2% met the criteria for a complete mystical experience.

TABLE 3 | Top 10 **(A)** highest and **(B)** lowest scoring items of the 76-item Kundalini Awakening Scale (KAS; Sanches and Daniels, 2008).

Items	*M*	*SD*
(A) Highest Scoring Items		
I experienced an elevation of my consciousness.	6.67	0.97
I felt that my mind started to function differently.	6.61	0.86
I felt in touch with something measureless.	6.57	0.90
I experienced an expansion of my being.	6.53	1.06
I had experiences of elevation and bliss.	6.47	1.16
My consciousness has become wider than it was before my experience.	6.47	1.07
I'm aware of some deep changes in my personality since my experience.	6.45	1.07
I've felt humbled by the contact with a transcendent reality.	6.36	1.13
I had an experience of union with some divine force or energy.	6.34	1.41
I feel that I have developed a new channel of communication within me, since my experience.	6.27	1.26
(B) Lowest Scoring Items		
I experienced seeing people or objects that weren't materially present and this made me feel scared and frightened.	3.07	2.10
I experienced an unusual cold only in a specific part of my body.	3.14	1.83
I experienced an unusual cold in my body moving from place to place.	3.22	1.97
I experienced a temporary incapability to read.	3.36	2.17
I experienced a halo in my head which increased after a spell of prolonged concentration.	3.45	2.12
I felt very depressed.	3.54	2.31
I experienced an odd functioning of my reproductive system.	3.58	2.13
I experienced an odd functioning of my excretory system without an apparent physical cause.	3.65	2.23
I sensed unusual cold inside my body, or on my skin.	3.68	2.27
I experienced a shining halo emanating from my head.	3.76	2.16

Mental Well-Being Implications of SSA/SKAs

When participants were asked whether they felt that their experience had been predominantly positive or negative in the *short-term*, 90.8% responded that the experience was positive, and 9.2% responded that it was negative. However, when participants were asked whether they felt that their experience had been predominantly positive or negative in the *long-term*, 98% responded that the experience was positive, and only 2% responded that it was negative, implying that SSA/SKAs were more likely to be perceived as positive in the long-term even following negative short-term experiences, but that both short and long-term effects were predominantly positive.

SSA vs. SKA

Our first hypothesis was tested by comparing the reported experiences of SSAs to those of SKAs using the KAS, MEQ30, and 11D-ASC scales. Independent samples *t*-tests with a Bonferroni correction were conducted to compare the mean subscale scores between the groups. A statistically significant difference was observed between the groups in the KAS subscales of involuntary positionings [$t_{(150)} = 4.21$, $p < 0.001$, mean difference $= 1.24$] and physical symptoms [$t_{(150)} = 4.50$, $p < 0.001$, mean difference $= 0.91$]. Spontaneous Kundalini Awakenings scored higher for both. A significance level of $\alpha = 0.05/5 = 0.01$ was used. No statistically significant difference was observed between the groups in the MEQ30 and 11D-ASC scales.

Participants' responses to the "significant factors" questionnaire item were compared between the SSA and SKA groups using a chi-square test of independence. Results show a statistically significant association between the SKA group and prior yoga practice, $\chi^2_{(1,\, N=152)} = 8.84$, $p = 0.003$. Results also show a significant association between the SSA group and no discernible trigger $\chi^2_{(1,\, N=152)} = 4.10$, $p = 0.04$.

No significant differences were found between the SSA and SKA groups in duration of experience.

SSA/SKA Altered States vs. Non-drug Altered States

Mean scores ranged from 28.67 ($SD = 26.85$) for anxiety to 78.77 ($SD = 26.45$) for blissful state.

The SSA/SKA 11D-ASC mean subscale scores were visually compared to those of non-drug altered states, specifically to altered states produced in an anechoic darkroom chamber, a floatation tank, through Holotropic Breathwork (Luke et al., 2019), and a ganzfeld environment (classic white noise) (Schmidt and Prein, 2019). Spontaneous Spiritual and Kundalini Awakenings appear similar in

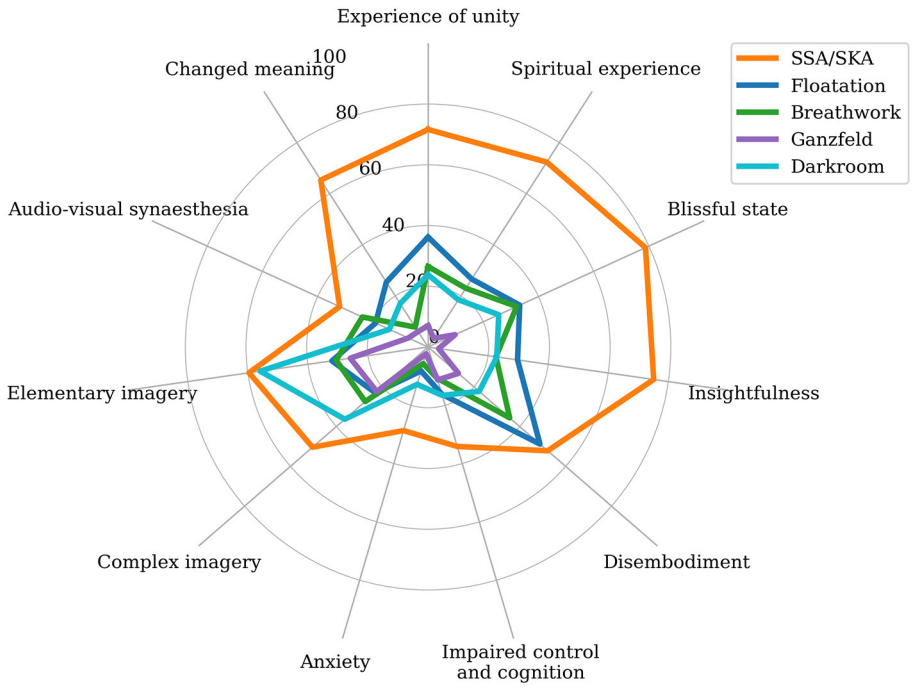

FIGURE 3 | Radar chart comparing the mean subscale scores of the 11-Dimensional Altered States of Consciousness Rating Scale (11D-ASC; Studerus et al., 2010) for the participants of this study (SSA/SKA; $N = 152$) and for non-drug induced altered states of consciousness (ASCs) produced by the floatation tank (Floatation; 60 min; $N = 27$; Luke et al., 2019); Holotropic Breathwork (Breathwork; 60 min; $N = 23$; Luke et al., 2019); anechoic darkroom (Darkroom; 120 min; $N = 46$; Luke et al., 2018); and ganzfeld environment (Ganzfeld; 25 min; $N = 22$; Schmidt and Prein, 2019).

their relative phenomenological distribution (though not in magnitude) compared to all measured non-drug altered states.

Figure 3 reveals considerably higher scores across all 11 dimensions for SSA/SKA ASCs compared to all other measured non-drug ASCs, with the exception of simple imagery ($M = 59.61$, $SD = 33.72$) compared with the darkroom ASC ($M = 55.90$), and disembodiment ($M = 52.17$, $SD = 34.33$) compared with the floatation tank ASC ($M = 48.80$), where observed scores are not significantly higher. This suggests that whilst SSA/SKAs and other measured non-drug ASCs are similar in their phenomenological distributions, recalled SSA/SKAs were generally considerably stronger than other individual ASC inductions across most dimensions.

SSA/SKA Altered States vs. Drug Altered States

The SSA/SKA 11D-ASC mean subscale scores were visually compared to those of drug-induced ASCs, specifically: LSD 200 mcg ($N = 16$) (Schmid et al., 2015), MDMA 125 mg ($N = 16$) (Hysek et al., 2013), psilocybin 30 mg/70 kg ($N = 20$) (Carbonaro et al., 2018), dextromethorphan 400 mg/70 kg ($N = 20$) (Carbonaro et al., 2018), DMT 40–75 mg ($N = 35$) (Luke, 2019), and cannabis ($N = 111$) (Luke et al., 2019). Particularly striking were the similarities observed between the phenomenological distributions of SSA/SKAs and psilocybin, and SSA/SKAs and DMT (**Figure 4**), although mean SSA/SKA subscale scores are higher than both psilocybin and DMT in changed meaning, unity experience, spiritual experience, blissful state, insightfulness, anxiety, and impaired cognition; higher than DMT in synaesthesia and complex imagery; and higher than psilocybin in simple imagery.

Spontaneous Spiritual and Kundalini Awakenings were visually compared to DMT sub-mystical experiences (40–75 mg; $N = 14$; Luke, 2019), and DMT complete mystical experiences (40–75 mg; $N = 21$; Luke, 2019) (**Figure 5**). Strongest similarities were observed between SSA/SKAs and DMT complete mystical experiences, where SSA/SKAs scored higher in spiritual experience, blissful state, insightfulness, impaired cognition, anxiety, synaesthesia, complex imagery, and changed meaning; and DMT complete mystical experiences scored higher than SSA/SKAs in simple imagery, disembodiment, and unity experience.

While it is important to consider that reported SSA/SKAs relate to participants' most powerful experience, results suggest that the SSA/SKA phenomenon is closer in distribution and magnitude to ASCs produced by strong doses of potent psychedelic drugs, particularly those capable of inducing mystical experiences such as psilocybin and DMT, than to any other measured drug and non-drug induced ASC.

Trait Absorption and TLL as Predictors of SSA/SKA Intensity

Our second hypothesis was tested by performing multiple linear regression between the two independent variables: trait absorption and TLL, as measured with MODTAS and IIPSS, respectively, and each four dependent variables, which

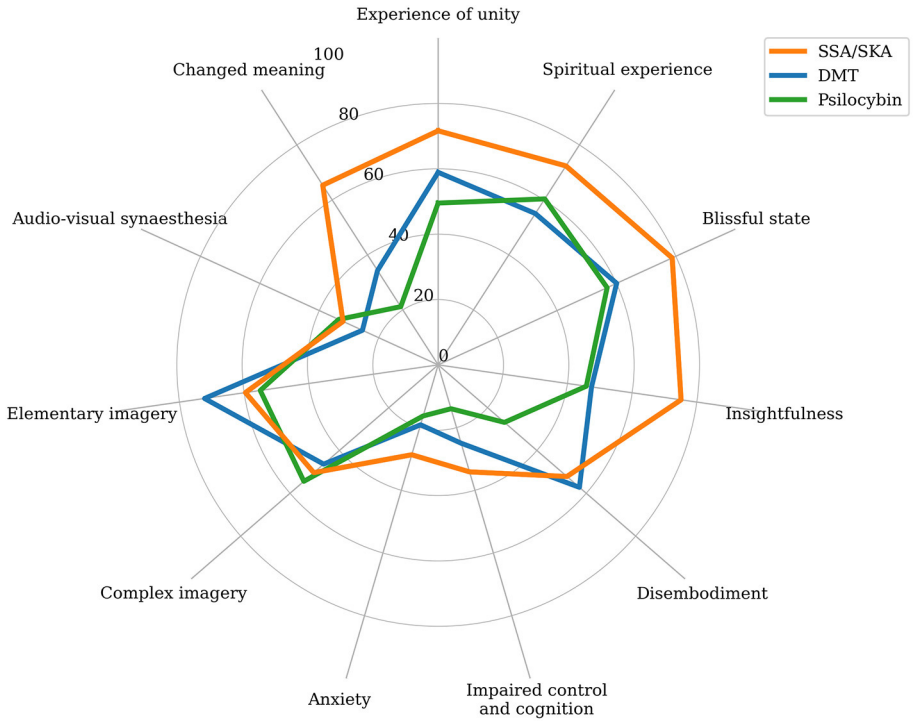

FIGURE 4 | Radar chart comparing the mean subscale scores of the 11-Dimensional Altered States of Consciousness Rating Scale (11D-ASC; Studerus et al., 2010) for the participants of this study (SSA/SKA; $N = 152$) and for drug induced altered states of consciousness (ASCs) produced by high dose psilocybin (Psilocybin; 30 mg/70 kg; $N = 20$; Carbonaro et al., 2018); and high dose *N,N*-dimethyltryptamine (DMT; 40–75 mg; $N = 35$; Luke, 2019).

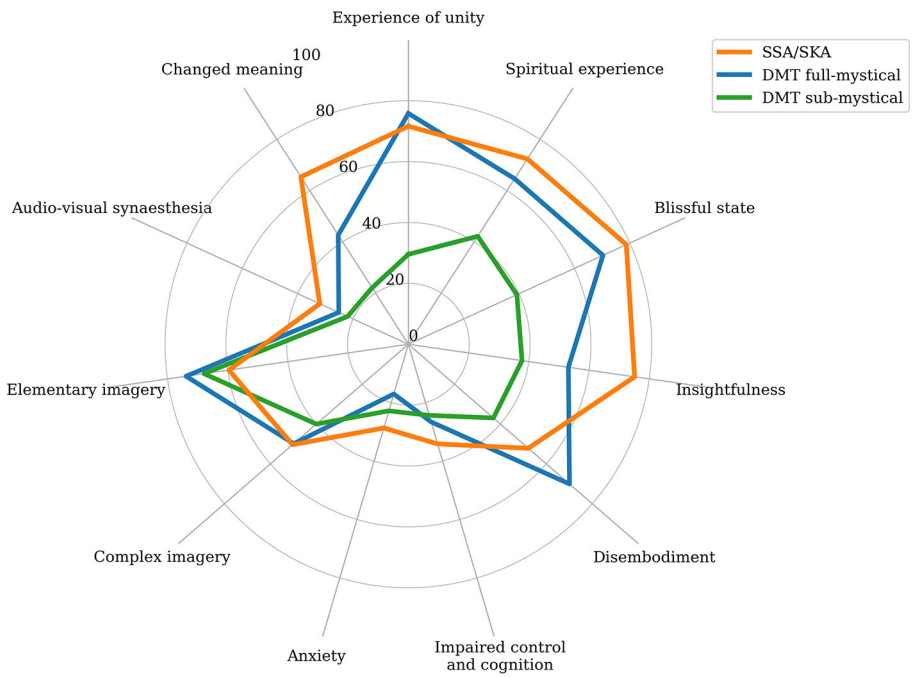

FIGURE 5 | Radar chart comparing the mean subscale scores of the 11-Dimensional Altered States of Consciousness Rating Scale (11D-ASC; Studerus et al., 2010) for the participants of this study (SSA/SKA; $N = 152$); high dose *N,N*-dimethyltryptamine complete mystical experience (DMT full-mystical; 40–75 mg; $N = 21$; Luke, 2019); and high dose *N,N*-dimethyltryptamine sub-mystical experience (DMT sub-mystical; 40–75 mg; $N = 14$; Luke, 2019), as defined by the 30-item Mystical Experience Questionnaire (MEQ30; MacLean et al., 2012).

present different ways of quantifying the intensity of SSA/SKA: nondual experience, measured with NETI; kundalini awakening, measured with KAS; mystical experience, measured with MEQ30; and altered state of consciousness, measured with the 11D-ASC.

All assumptions of linear regression, including assumptions of normality, were sufficiently met. Since there were four regression models with two predictors each, a Bonferroni multiple comparisons correction was applied to adjust $\alpha = 0.05/4 = 0.01$.

A statistically significant association between MODTAS and IIPSS, and NETI scores was observed: $F_{(2, 141)} = 9.67$, $p < 0.001$, $R^2 = 0.12$. Both IIPSS ($B = -0.19$, $p < 0.001$) and MODTAS ($B = 0.29$, $p < 0.001$) added significantly to the prediction. The standardised regression coefficients were −0.33 for IIPSS, and 0.39 for MODTAS, suggesting that MODTAS may be a stronger predictor of NETI than IIPSS. However, the two IVs are not sufficient to explain the variance in the dependent variable, as shown by the low value of R^2.

The association between MODTAS and IIPSS, and KAS scores was also found to be statistically significant: $F_{(2, 141)} = 35.74$, $p < 0.001$, $R^2 = 0.34$. Both IVs added significantly to the prediction: $B = 0.23$, $p = 0.006$ for IIPSS, and $B = 0.56$, $p < 0.001$ for MODTAS. The standardised regression coefficients were 0.23 and 0.42 for IIPSS and MODTAS, respectively, suggesting that MODTAS may be a stronger predictor of KAS than IIPSS.

Modified Tellegen Absorption Scale and IIPSS significantly predicted MEQ30 scores: [$F_{(2, 143)} = 23.88$, $p < 0.001$, $R^2 = 0.25$]. Modified Tellegen Absorption Scale was a significant predictor ($B = 0.66$, $p < 0.001$), but the IIPSS was not ($B = -0.07$, $p = 0.40$). The standardised regression coefficients were −0.07 and 0.54 for IIPSS and MODTAS, respectively.

Modified Tellegen Absorption Scale and IIPSS significantly predicted 11D-ASC scores: $F_{(2, 143)} = 34.91$, $p < 0.001$, $R^2 = 0.33$. Modified Tellegen Absorption Scale was a significant predictor ($B = 1.12$, $p < 0.001$), but the IIPSS was not ($B = 0.41$, $p = 0.02$). The standardised regression coefficients were 0.21 and 0.43 for IIPSS and MODTAS respectively.

In these models, MODTAS was a better predictor of all outcome variables. Iowa Interview for Partial Seizure-like Symptoms on the other hand, was a significant predictor of all outcome variables with the exception of MEQ30 and 11D-ASC. Furthermore, an increased value of MODTAS predicted an increased score for all DVs, whereas the sign of prediction changed for IIPSS (i.e., negative for NETI and MEQ30). Whilst all four scales used to measure the DVs quantify the intensity of SSA/SKAs, they measure varying aspects of the same experience, which is reflected in the differences between the results of the four regression models.

DISCUSSION

Differences Between SKAs and SSAs

The extent to which SKAs differ from SSAs has seldom been explored in psychological literature, and both terms have been used interchangeably to refer to the same experience in past research. While the clear-cut categorisation of such subjective experiences may be problematic, the interchangeability of both terms can be confusing if the experiences they refer to vary, even if only slightly. The hypothesis that SKAs score higher in physical and negative symptoms than SSAs, was therefore introduced to help better identify the subtle differences between both types of spontaneous awakening experiences.

The supposition that SKAs were more likely to produce greater physical and negative effects than SSAs stemmed from the frequent references in transpersonal literature associating subjectively intense, energetic, and often physically challenging awakening experiences to spiritual emergency (Goretzki et al., 2013; St Arnaud and Cormier, 2017; Woollacott et al., 2020). Our results, which indicate that SKAs are significantly more physical than SSAs, are congruent with existing literature on kundalini awakenings, which has frequently alluded to the dominant physical characteristics of this type of awakening experience (Sanches and Daniels, 2008; Goretzki et al., 2013; De Castro, 2015; Lindahl et al., 2017; Lockley, 2019). However, the assumption that SKAs are significantly more negative than SSAs, informed by existing literature alluding to the strong associations between physical and negative symptoms in kundalini awakenings (Lukoff, 1985; Greyson, 1993; Johnson and Friedman, 2008), was not met in this study. It is worth noting, however, that these associations have merely been postulated in existing literature, and that these differences have not, until now, been explicitly laid-out, leaving much room for interpretation. While aiming to address this lack of information, the hypothesis of our exploratory study was therefore also founded on it.

Furthermore, and importantly, a number of items relating to negative experience in the KAS scale also referred to physical symptoms that may not have been considered overwhelmingly negative at the time of the SSA/SKA experience. For instance, item 11: "I've experienced an odd functioning of my reproductive system" (Sanches and Daniels, 2008), may have been a relatively pleasant experience for some. Similarly, item 24: "I've experienced my mind as an uncontrollable incessant flux of ideas or thoughts" (Sanches and Daniels, 2008), may not have been interpreted as particularly negative or challenging to the experiencer at the time of their experience. The inclusion of these and similar items in the KAS negative subscale may therefore be problematic.

It is also worth considering that, whilst a general definition of awakening experiences was provided in the study brief, participants were left to self-determine and label their recalled most powerful awakening experience as either SSA or SKA, and no definition of these individual terms was provided by the authors to facilitate this process. Whilst this was intentional, the subjective interpretation of these terms may have caused slight inconsistencies during the sampling process of both sets of experiences. For instance, participants undergoing spontaneous awakening experiences with strong physical and/or negative symptoms may not necessarily identify with the term SKA if they come from socio-cultural and religious backgrounds that do not identify with Eastern culture and/or philosophy, or if they have not been exposed to the terminology, as may be the case for individuals who have had these experiences outside of a spiritual or religious context. This speculation is partially supported by the reported significant factors that participants felt led them to have the experience, in that yoga practice was more commonly reported in the SKA group compared to the SSA group, and "no

discernible trigger" was more commonly reported in the SSA group compared to the SKA group.

Whilst this section aimed as a preliminary exploration of the main differences between SSAs and SKAs, more in depth analysis is warranted, and multi-group confirmatory factor analysis comparing theses experiences with each other and with other altered states experiences will be reported in a future study. Furthermore, future studies should consider using the SES (Goretzki et al., 2014) to better distinguish between individuals experiencing spiritual emergency and those that are not, which could be explored against reported SSA and SKA experiences.

Effects on Well-Being

The highest scoring items on the NETI, KAS, and MEQ30 scales suggest that the general characteristics of SSA/SKAs are of a predominantly positive nature. Additionally, an overwhelming majority of participants reported that their SSA/SKA had a predominantly positive impact on their well-being in both the short and long-terms, when asked whether their experience was predominantly positive or negative. A higher percentage of participants reporting the positive long-term well-being effects mediated by SSA/SKAs, than those reporting positive short-term well-being effects, suggests that SSA/SKAs may still be perceived as overwhelmingly positive in the long-term, even when the experience was initially challenging. It is also worth noting that over half of our participants reported psychological turmoil or trauma as a significant factor which they believed led them to have the experience, making it the highest reported factor of SSA/SKA in our sample. This is in line with results from existing research (Greyson, 2000; Taylor, 2012, 2015; Woollacott et al., 2020), and further supports the potential for these experiences to yield deep, transformational shifts which can result in long-lasting therapeutic change. Furthermore, the results from our study indicate an increase across all measured spiritual and holistic practices post-SSA/SKA experience, except for the use of psychedelics and entheogens. These activities, including contact with nature, mindfulness, yoga, and meditation, cultivate healthy internal, pro-environmental, and pro-social behaviours such as increased altruism, empathy, trust, confidence, optimism, reduced stress and depression, and better problem solving (Patel et al., 1985; Khalsa et al., 2008; Khanna and Greeson, 2013; Lifshitz et al., 2019). These results, therefore, not only support the supposition that SSA/SKAs mediate overall positive short and long-term effects on well-being, but also that they trigger shifts towards more positive ways of living. These results are consistent with existing studies (Taylor, 2012, 2015; Taylor and Egeto-Szabo, 2017; McGee, 2020).

Mystical experiences (including spiritual awakenings), have been linked to promising improvements in both *subjective* and *objective* states of well-being, as is evidenced by the sustained improvements of treatment-resistant depression (Carhart-Harris et al., 2016), significant reductions in anxiety, hopelessness, and fear of death in patients with life-threatening cancer (Ross et al., 2016), and treatment of treatment-resistant alcohol and tobacco addiction (Green et al., 1998; Garcia-Romeu et al., 2014), mediated by psilocybin-occasioned mystical experiences. Our results support the potential for awakening experiences of a spontaneous nature to occasion deeply therapeutic short and long-term benefits. Our study thus challenges the default pathologisation of spontaneous awakening experiences, addresses the importance for an immediate de-stigmatisation of these experiences within psychiatry, and invites a more holistic, patient-centred approach to researching spiritual and transcendent experiences.

Relationship to Other ASCs

The observed similarities between the score distributions of SSA/SKA ASCs and all measured non-drug ASCs suggest phenomenological similarities between the groups, supporting the postulation, originally put forward by psychiatrist Ludwig (1966), that all ASCs are phenomenologically similar, whether induced or spontaneous. However, the considerably higher mean scores observed across all subscales in the SSA/SKA sample relative to all measured non-drug ASCs suggests that SSA/SKAs are generally reported as subjectively more intense.

Whilst inferential comparisons were not carried-out between the score distributions of SSA/SKA ASCs and drug-induced ASCs due to a lack of access to raw data from published studies, observed comparisons suggest strong phenomenological similarities between both sets of ASCs. The score magnitude observed across most subscales in the SSA/SKA sample relative to those of all measured drug ASCs, also suggests that SSA/SKAs are more powerful ASCs than all measured drug ASCs, including powerful psychedelic drugs. Particularly striking were the observed similarities, both in magnitude and distribution, between SSA/SKAs and drug-induced ASCs capable of triggering mystical experiences: specifically psychedelic drugs psilocybin and DMT. These results are interesting, not least because the profiles of drugs such as psilocybin and DMT are similar to those of SSA/SKAs in their spiritual outcomes and proposed therapeutic effects (Griffiths et al., 2006, 2008; Carhart-Harris et al., 2016; Ross et al., 2016). It is important to consider, however, that most powerful SSA/SKA experiences were compared to one-off drug and non-drug induced experiences, and a fairer analysis may have been to compare most powerful SSA/SKAs with recalled most powerful drug or non-drug induced ASCs. However, these findings deserve further exploration. The observed phenomenological similarities between SSA/SKA ASCs and psychedelic ASCs, could indicate the potential for research on psychedelic-occasioned mystical experiences to shed light on some of the neurobiological underpinnings and therapeutic potentials of SSA/SKAs, and SSA/SKA research may similarly help inform the study of psychedelic-occasioned mystical experiences.

The observed comparisons indicate a consistent distributional similarity in phenomenology between SSA/SKAs and all measured drug and non-drug ASCs. These overall results propose, therefore, another dimension through which the SSA/SKA phenomenon may be observed. A future study will be undertaken by the authors to statistically compare SSA/SKA ASCs with a range of drug and non-drug ASCs.

Predictors of SSA/SKAs

Temporal lobe lability and trait absorption are considered two effective predictors for measuring the proclivity for ASC experiences. These have been used together to measure intensity

of ASC experiences produced by drugs such as cannabis, and in non-drug induced contexts such as the anechoic dark room chamber, floatation tank, and during Holotropic Breathwork (Luke et al., 2018, 2019). According to our results, TLL and trait absorption positively correlate with the SSA/SKA experience, implying that individuals scoring higher in TLL and absorption are more likely to experience higher intensity SSA/SKAs. However, trait absorption, which has been used exclusively to predict ASC predisposition in psychedelics such as psilocybin (Studerus et al., 2012; Studerus, 2013), LSD (Carhart-Harris et al., 2015; Terhune et al., 2016), MDMA (Hastings, 2006), ayahuasca (Bresnick and Levin, 2006), and DMT (Timmermann et al., 2018), was found to be a better predictor of all SSA/SKA outcomes than TLL.

Indeed, as noted in the Introduction, this is perhaps not wholly surprising, as trait absorption has been found to predict mystical and quasi-mystical experiences produced endogenously in certain sensory-depriving, homeostasis-unbalancing, and trance-inducing contexts (Rock, 2009; Luhrmann et al., 2010; Bronkhorst, 2016; Luke et al., 2018; Glicksohn and Ben-Soussan, 2020), as well as some of the common characteristics of spiritual states associated with SSA/SKAs, such as stronger empathy (Wickramasekera and Szlyk, 2003; Wickramasekera, 2007), stronger flow states (Marty-Dugas and Smilek, 2019), more pronounced creativity (Wild et al., 1995; Manmiller et al., 2005), a stronger attachment to nature and other forms of life (Kaplan, 1995; Brown and Katcher, 1997), feelings of self-transcendence (Cardeña and Terhune, 2014), more pronounced experiences of synaesthesia (Rader and Tellegen, 1987; Glicksohn et al., 1999; Chun and Hupé, 2016), alterations in time-space perception and meaning (Pekala et al., 1985; Kumar and Pekala, 1988), and paranormal beliefs or experiences (Glicksohn, 1990, 2004; Spanos et al., 1993; Glicksohn and Barrett, 2003; Granqvist et al., 2005; French et al., 2008; Parra, 2008; Zingrone et al., 2009; Luhrmann et al., 2010, 2021; Gray and Gallo, 2016; Parra and Gimenez Amarilla, 2016), in drug and non-drug contexts relative to the general population. The differences in measured predictions of SSA/SKA intensity between TLL and absorption are likely due to the fact that each dependent variable used in our study measured slightly different aspects of overall SSA/SKA experiences (i.e., kundalini awakening, nondual experience, mystical experience, ASC).

Whilst these results further our understanding on the relationship between trait absorption, TLL, and ASCs such as SSA/SKAs, it is important to consider that both MODTAS and IIPSS scales are typically used prospectively to measure proclivity for ASC outcomes, and due to the spontaneous nature of SSA/SKAs, this study was not able to follow the typical protocol. The direction of the correlation between TLL and absorption levels, and SSA/SKA experiences, therefore, remains unclear. The spontaneous nature of SSA/SKAs makes the chances for a future prospective study highly unlikely.

Interestingly, when comparing the TLL score distributions from the SSA/SKA sample with those from the published "normal" population sample, SSA/SKA scores were considerably higher, with the largest observed differences present in the high score range. The greater TLL traits in the SSA/SKA sample compared to the published "normal" population sample may suggest a higher tendency for partial seizure-like symptoms typical of TLE among SSA/SKA experiencers. Similarly, these results might suggest a higher likelihood of experiencing SSA/SKA if an individual is predisposed to experiencing partial seizure-like symptoms, typical of TLE.

The observed mean scores across the MODTAS subscales were found to only be slightly higher in the SSA/SKA sample compared to the published "normal" population sample, with the exception of the ASC subscale, where the mean score was more than double that of the "normal" population. This result is not totally unexpected, considering the very nature of the experiences that the ASC subscale measures—as is further evinced by the two highest scoring items (8 and 9): "I think I really know what some people mean when they talk about mystical experiences" and "I can step outside my usual self and experience an entirely different state of being"—which directly refer to mystical experiences. This would suggest that, whilst absorption predicts the intensity of SSA/SKAs, SSA/SKAs are not limited to individuals with high absorption levels.

Inferential comparisons between the SSA/SKA group and the MODTAS and IIPSS published "normal" population groups were not possible due to a lack of access to raw published data, however, these are proposed for a future study.

LIMITATIONS

In addition to the limitations discussed under each section in the above discussion, this study suffers from the following general limitations. First, participants were asked to retrospectively recall their most powerful SSA/SKA, a method which may be vulnerable to error. However, Griffiths et al. (2006), who conducted a study on the reliability of the recall of mystical experiences, suggested that retrospective recall in this context is not as prone to error as in other contexts, which may be explained by the subjective significance of these experiences. Another limitation is that little research had been conducted prior to this study on the experience of spiritual awakenings, and less so on spiritual awakening experiences of a spontaneous nature. Many of our initial assumptions were therefore based on anecdotal considerations. Finally, it is important to consider that Cronbach's alpha scores for 3 of the 11D-ASC subscales were somewhat lower than previously published figures, and internal consistency was therefore not as robust as the authors would have expected. Findings should therefore be interpreted with some caution.

Future studies should be conducted to qualitatively address the phenomenological variances of overall SSA/SKA experiences, their well-being effects and how they compare with psychopathologies capable of producing mystical experiences. In depth comparative tests should also be conducted to understand how SSAs and SKAs correlate with well-being outcomes in both short and long terms. Another important avenue for future research would be to study whether cultural destigmatisation and access to peer support (e.g., spiritual crisis networks) predict better integration of initially challenging SSA/SKA experiences and increase the likelihood of positive outcomes. Finally, a more statistically rigorous comparison between SSA/SKAs

and drug-induced ASCs may help us better understand these phenomena, their neurobiological underpinnings, and their potential therapeutic impacts.

CONCLUSION

In conclusion, the phenomenological differences between SSAs and SKAs were significant in physical but not in negative experiences, and both personality trait absorption and TLL were positively associated with the intensity of SSA/SKAs, indicating them as good predictors of the overall experience. Furthermore, SSA/SKAs were found to be phenomenologically similar in distribution, but considerably greater in magnitude, than all other measured ASCs. While inferential statistics were not possible between the SSA/SKA ASC and the ASCs produced by psilocybin and DMT, visual comparisons revealed striking similarities between SSA/SKA and psilocybin, and SSA/SKA and DMT, which is in line with recent studies that have pointed to the positive association between the mystical experiences produced by these drugs, and their therapeutic effects. Given the overwhelmingly positive reported effects of SSA/SKAs on well-being in our study, and given the existing literature supporting the potential for spiritual experiences to both treat disorders such as addiction, depression and anxiety, and move people towards increased pro-social and pro-environmental behaviours, more attention from the research community is warranted. This study highlights the importance of recognising SSA/SKAs as valuable experiences that, if properly navigated, carry the potential to positively transform peoples' lives.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Dr. Yang Ye, Acting Chair of Ethics—University of Greenwich Departmental Research Ethics Committee. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

JSC designed and conducted the research, recruited the participants, analysed the data, wrote and reviewed the paper. DL designed the research, analysed the data and reviewed the paper. All authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.720579/full#supplementary-material

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Wondering Awe as a Perceptive Aspect of Spirituality and Its Relation to Indicators of Wellbeing: Frequency of Perception and Underlying Triggers

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Background: Spirituality is a multidimensional construct which includes religious, existentialistic, and relational issues and has different layers such as faith as the core, related attitudes and conviction, and subsequent behaviors and practices. The perceptive aspects of spirituality such as wondering awe are of relevance for both, religious and non-religious persons. These perceptions were related to perceiving the Sacred in life, mindful awareness of nature, others and self, to compassion, meaning in life, and emotional wellbeing. As awe perceptions are foremost a matter of state, it was the aim (1) to empirically analyze the frequency of wondering awe perceptions (i.e., with respect to gender, age cohorts, religious or non-religious persons) and (2) to qualitatively analyze a range of triggers of awe perceptions.

Methods: Data from 7,928 participants were analyzed with respect to the frequency of Awe/Gratitude perceptions (GrAw-7 scale), while for the second part of the study responses of a heterogeneous group of 82 persons what caused them to perceive moments of wondering awe were analyzed with qualitative content analysis techniques.

Results: Persons who experience Awe/Gratitude to a low extend were the youngest and had lowest wellbeing and lowest meditation/praying engagement, while those with high GrAw-7 scores were the oldest, had the highest wellbeing, and were more often meditating or praying ($p < 0.001$). Gender had a significant effect on these perceptions, too (Cohen's $d = 0.32$). In the qualitative part, the triggers can be attributed to four main categories, *Nature*, *Persons*, *Unique Moments*, and *Aesthetics*, *Beauty*, and *Devotion*. Some of these triggers and related perceptions might be more a matter of admiration than wondering awe, while other perceptions could have more profound effects and may thus result in changes of a person's attitudes and behaviors.

Conclusion: Emotionally touching experiences of wondering awe may result in feelings of interconnectedness, prosocial behavior, mindful awareness, and contribute to a person's meaning in life and wellbeing and can also be a health-relevant resource. These perceptions can be seen as a perceptive aspect of spirituality, which is not exclusively experienced by religious people but also by non-religious persons.

Keywords: awe perceptions, spirituality, mindfulness, wellbeing, secular concepts, qualitative analyses

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INTRODUCTION

Spirituality is a complex and multidimensional construct which includes religious, existentialistic, prosocial-humanistic, and relational issues (Zwingmann et al., 2011) and, from a conceptual point of view, has different layers such as some kind of "faith" as the core, related attitudes and convictions, and subsequent behaviors and practices (Büssing, 2019). Depending on the religious and cultural background, there are several definitions what spirituality is or might be (Emmons, 2000; Tanyi, 2002; Hill and Pargament, 2003; Engebretson, 2004; Büssing, 2019). Some refer to specific and exclusive religious faith traditions and only rarely cover also non-religious approaches. Other refer mainly on cognitive approaches (attitudes and convictions) and spiritual practices (praying, meditation) and less on perceptive/experiential aspects (Zwingmann et al., 2011; Büssing, 2019). However, also persons who would not regard themselves as religious may have interest in (non-religious) spiritual issues, that is, they are in search of meaning in life, something that gives their live value and orientation, they try to mindfully encounter the world around, to compassionately care for others, and they have feelings of wondering awe in specific situations (Büssing et al., 2009, 2013, 2014; Büssing, 2020). Also for children's spirituality, it was stated that "Spirituality is the experience of the sacred other, which is accompanied by feelings of wonder, joy, love, trust, and hope (…)" (Engebretson, 2004). Moments of wonder or wondering awe are a perceptional aspect of spirituality which is experienced by various groups of persons – also by persons with special needs and cognitive impairment (Büssing et al., 2017). Although it is not an identical construct but may be related, training of mindful awareness in palliatively treated cancer patients enhanced their wellbeing and helped them to reconnect "with their values and spiritual beliefs" (Poletti et al., 2019). In patients with epilepsy, training of mindful awareness raised acceptance of their health condition and "re-integrating their condition" (Bauer et al., 2019). In line with this, both mindfulness training and gratitude interventions can improve wellbeing and mental health (O'Leary and Dockray, 2015). This finding is of relevance as gratitude, which was found to be associated with awe perceptions (Büssing et al., 2014, 2018a), mediates the link between mindfulness and positive mood states (Mirnics et al., 2020).

Feelings of wondering awe are foremost an emotional reaction toward touching experiences (Keltner and Haidt, 2003; Pearsall, 2007; Silvia et al., 2015) that do not necessarily require a religious background, although awe can be a religious experience, too (James, 1997). Gallagher et al. (2015) differentiated *awe* as a first-order level of experience from *wondering* which is described as a reflective second-order experience; they considered awe as an immediate experience that may motivate more reflective experiences. Empirical studies have shown that pausing in specific situations with feelings of wondering awe (and subsequent feelings of gratitude) is of relevance for both, religious and non-religious persons; all may perceive moments of wondering awe or admiration, yet to differentiated degrees (Büssing et al., 2013, 2014, 2020a; Büssing, 2020). Persons with depressive diseases experience awe and related feelings of gratitude similarly like other persons with psychiatric or neurological diseases, too, but they perceive the beauty of life and nature less often, which can be a trigger of feelings of awe (Büssing et al., 2014).

Yaden et al. (2019) operationalized six main dimensions of awe as a state: altered time perception, self-diminishment, connectedness, perceived vastness, physical sensations, and need for accommodation. In fact, there might be small moments of wonder or admiration, but also the more rare vast experiences that change a person's life with a need for accommodation as suggested by Keltner and Haidt (2003). Our group's operationalization refers more to the (phenomenologically inspired) experiential aspects (in terms of a state) that do not require altered time perceptions or feelings of vastness or explicit physical sensations. Instead, the Awe/Gratitude scale (GrAw-7; Büssing et al., 2018a) refers to the general ability to experience nature's beauty, the perception of being captivated by the beauty of nature, to pause "spellbound at the moment" (which implies that time "stands still" for a moment), becoming "quite and devout" in specific situations and locations, and thus feelings of "wondering awe," and subsequently feelings of gratitude because in these moments of pausing one may consider so many things one may feel grateful for. Although, the experience of vastness was seen as central by Keltner and Haidt (2003), it is a very exceptional experience which is not shared by too many persons. In most situations, awe is further not a matter of self-diminishing or even fear anymore, but a positive experience of being "touched" (Shiota et al., 2007).

In terms of positive psychology, awe perceptions are related rather to emotional well-being (Krause and Hayward, 2015; Büssing et al., 2021a), prosocial behaviors (Piff et al., 2015) and commitment to the creation and disadvantaged persons (Büssing et al., 2018b) and to mindful awareness of nature, others, and self (Büssing et al., 2020a, 2021a). Experimental studies by Rudd et al. (2012) approved that awe experiences may facilitate intentions to invest time helping others and that awe sensitizes for the "present moment," resulting in higher life satisfaction. The underlying personality traits seem to be relevant too, as awe is related to openness to new experiences (Silvia et al., 2015; Yaden et al., 2019) and much weaker also to Neuroticism and Agreeableness (Yaden et al., 2019); it is also related to the spiritual background of a person, as awe was found to be strongly related to the intention to live from the faith and to experience the Sacred in life (Büssing et al., 2018b) and to their frequency of meditation or praying (Büssing et al., 2021a).

During the COVID-19 pandemic, Awe/Gratitude was the best predictor of perceived positive changes in terms of post-traumatic growth and a resource to recognize the still positive aspects in life (Büssing et al., 2021a,b). Using the three-item precursor version of the GrAw-7 scale, Gratitude/Awe was moderately inversely related to depressive symptoms in patients with fibromyalgia, but not with anxiety or general physical health (data source: Offenbaecher et al., 2013). Other studies found that awe may buffer negative feelings (Koh et al., 2017; Atamba, 2019) and is related to positive emotions and less anxiety (Rankin et al., 2019).

Thus, awe perceptions may sensitize people to be more aware of the world around in terms of mindfulness, to actively help

others, and with emotional wellbeing and mental stability. In fact, dispositional awe was found to be related to meaning in life and subjective well-being of young adults from China, where meaning in life seems to mediate the interaction between awe and wellbeing (Zhao et al., 2019). In a study by Aschoff (2021) among medical doctors working voluntarily for people in need, Awe/Gratitude was moderately related to the presence component of meaning in life, but not with its search component. This would further indicate that meaning in life (which is one of the many aspects of spirituality) is a stabilizing factor for a person's wellbeing that would either facilitate awe perceptions or is its outcome.

However, findings also indicate that awe perceptions may be either mild and brief in terms of an aesthetic fascination, or profound, intense, memorable, and "transformative" (Cohen et al., 2010; Silvia et al., 2015). This transformative aspect of awe, which may start with a change of views, attitudes, and eventually also behaviors and may imply responsibility taking for the world around, may link it again to the topic of spirituality (Büssing et al., 2018b). Cohen et al. (2010) described that these "highly emotional experiences" may result in "long-lasting and meaningful changes in personality" and referred these changes to the topic of "spiritual transformation," as described by others, too (Keltner and Haidt, 2003; Ironson and Kremer, 2009; Kremer and Ironson, 2009; Büssing et al., 2018b; Penman, 2021). However, one may assume that only the profound and intense perceptions may change a person's views, attitudes, and behaviors in terms of a "transformation," but not necessarily the aesthetic fascination.

As perceptions of awe are foremost a matter of state (Büssing et al., 2018a; Yaden et al., 2019), it is important to analyze who is experiencing it and what the triggers are. Aim was therefore (1) to empirically analyze the frequency of wondering awe perceptions, particularly with respect who is experiencing it stronger than others (i.e., women and men, age cohorts, religious or non-religious persons, and persons with specific lifestyles) and (2) to qualitatively analyze a range of triggers of awe perceptions reported by a heterogeneous sample of participants.

MATERIALS AND METHODS

Empirical Approach

Participants

For the empirical part, data sets of previous and current anonymous surveys were combined (i.e., Büssing et al., 2018a,b, 2020a, 2021a,b,c,d). Participants were informed about the study purposes, guaranteed confidentially, and they consented to participate by filling the anonym questionnaires, which were applied in most cases online. Neither identifying personal details nor IP addresses were recorded to guarantee anonymity.

Measures

Awe and Gratitude

Wondering awe is a perceptive aspect of spirituality that is experienced also by non-religious persons (Büssing et al., 2018a). To address times of pausing for astonishment or "wonder" in specific situations (mainly in the nature), perceived awe and subsequent feelings of gratitude were measured with the seven-item Awe/Gratitude scale (GrAw-7; Büssing et al., 2018a). This scale has good psychometric properties (Cronbach's alpha = 0.82) and is not contaminated with specific religious or spiritual terminology. It uses items such as "I stop and then think of so many things for which I'm really grateful," "I stop and am captivated by the beauty of nature," "I pause and stay spellbound at the moment," and "In certain places, I become very quiet and devout." Thus, Awe/Gratitude operationalized in this way is a matter of an emotional reaction toward an immediate and "captive" experience. The frequency of these perceptions was scored on a four-point scale (0 – never; 1 – seldom; 2 – often; and 3 – regularly) and finally transferred to a 100-point scale.

Perception of the Sacred

The Daily Spiritual Experience Scale (DSES) was developed as a measure of a person's perception of the Sacred in daily life, and thus, the items measure experience rather than particular beliefs or behaviors (Underwood and Teresi, 2002; Underwood, 2011). In contrast to the GrAw-7 questionnaire, responding positively to the DSES-6 requires belief in God. Here, the six-item version (DSES-6; Cronbach's alpha = 0.91) was used which uses specific items such as feeling God's presence, God's love, desire to be closer to God (union), finding strength/comfort in God, and being touched by beauty of creation (Underwood and Teresi, 2002). The response categories from 1 to 6 are "many times a day," "every day," "most days," "some days," "once in a while," and "never/almost never." Item scores were finally summed up, and thus, the scores range from 6 to 36.

Wellbeing

To assess participants' well-being, the WHO-Five Well-being Index (WHO-5) was used (Bech et al., 2013). Representative items are "I have felt cheerful and in good spirits" or "My daily life has been filled with things that interest me." Respondents assess how often they had the respective feelings within the last 2 weeks, ranging from "at no time" (0) to "all of the times" (5). Here, the sum scores ranging from 0 to 25 were reported.

Frequency of Meditation and Praying

The frequency of participants' spiritual/religious practices such as meditation or praying was assessed with a 4-grade scale ranging from "never" (0) to "at least once per month" (1), "at least once per week" (2), and "at least once per day" (3) as described (Büssing et al., 2020b).

Statistical Analyses

Data of 7,928 participants were used to assess their Awe/Gratitude perceptions. Within this larger sample, different subsamples recruited as different cohorts and at different time points were analyzed with respect to participants' wellbeing (WHO-5; $n = 5{,}395$), frequency of spiritual practices ($n = 3{,}385$), and perception of the Sacred (DSES-6; $n = 2{,}620$).

Descriptive statistics, ANOVA, and first-order correlations (Spearman rho) as well as internal consistency (Cronbach's

coefficient α) were computed with SPSS 23.0. The significance level of ANOVA and correlation analyses was set at $p < 0.01$. With respect to classifying the strength of the observed correlations, $r > 0.5$ is regarded as a strong correlation, r between 0.3 and 0.5 as a moderate correlation, r between 0.2 and 0.3 as a weak correlation, and $r < 0.2$ as negligible or no correlation.

Qualitative Approach

Data Analysis

For this study, free-text responses were analyzed using qualitative content analysis techniques (Krippendorff, 2004) referring to a phenomenologically inspired approach (Neubauer et al., 2019; Zahavi, 2019). Aim was to describe what was perceived by the participants and how (Teherani et al., 2015). To get open, experience-oriented narratives, participants were invited to state situations where they experienced moments of wondering awe ("Can you please describe when or where you had such feelings of wondering awe – what were the triggers/reasons?") and what they subsequently perceived and noticed ["What did you feel about it? (Please try to describe these feelings/sensations/reactions)"]. These free-text answers were then coded according to the mentioned topics (meaningful text segments), and a set of codes was developed. These codes were combined in a code list and grouped according to their motifs into main codes and subcodes. Representative text passages served as anchor quotations for the respective codes (categories). For this analysis, the focus is the triggers of awe which are described in detail, while the subsequent perceptions will be reported in detail elsewhere.

Participants

To get some degree of heterogeneity, healthy participants, both female and male, from different age cohorts and with different religious/spiritual backgrounds (incl. religious orders and yoga practitioners, but also persons without explicit spiritual practices and further non-religious persons) were invited by email in a larger European research network (i.e., university researchers, students, members of religious orders, and yoga practitioners) and subsequently informed about the purpose of the project, voluntary participation, and usage of short anonymous quotes for a publication. Eighty-two persons send back their written statements. Identifying information and respective mails were immediately deleted to assure anonymity of responses. Nevertheless, their gender, age, and religious background (which was not part of the analysis) were recorded to describe the sample. Among them, 56 were female and 26 were male, with a mean age of 52.9 ± 13.3 years (range 29–82). Thirty-three were Catholics and 21 Protestants, and 28 had other spiritual/religious backgrounds (incl. Buddhists and Yoga practitioners).

RESULTS

Empirical Approach

Description of Participants

For this study, data from 7,928 participants were used (**Table 1**). Among them, 64% were women and 36% men; <1% did not state their gender. Their mean age was 46 ± 16 years. Most were nominally Christians (81%), 3% had other religious affiliations, and 16% had none. There were further two specific subsamples, one with yoga practitioners (11%) and one with religious brothers and sisters (5%). Within the whole sample, 52% were never meditating, 14% at least once per month, 17% once per week, and 17% once per day, while 45% were never praying, 12% at least once per month, 13% once per week, and 31% once per day (**Table 1**). Participants' perception of the Sacred in daily life and also their wellbeing scored in the respective mid-ranges (**Table 1**).

Perceptions of Wondering Awe in the Sample

Participants experienced the beauty in nature or were "captivated by the beauty of nature" much more often than they had explicit feelings of "wondering awe" or were pausing "spellbound at the moment"; becoming "very quiet and devout" at certain places and thinking about all the things one is grateful about were experienced "in-between" (**Table 2**). A quite large fraction was seldom or never experiencing "feelings of wondering awe" (46%) or were pausing "spellbound in the moment" (40%).

These seven items can be combined to one factor, the GrAw-7 scale, which has a good internal consistency also in this large sample (Cronbach's alpha = 0.88) and explains 58% of variance. The mean score of this factor is 65.3 ± 19.7 (range 0–100; **Figure 1**). Here, 15% have scores < 1 SD of the mean, indicating low GrAw-7 scores, and 19% >1 SD, indicating high GrAw-7 scores.

Women have significantly higher scores than men (67.6 ± 19.3 vs. 61.3 ± 19.9, $F = 184.0$, $p < 0.0001$; Cohen's $d = 0.32$). Also, the age cohorts differ significantly ($F = 101.4$, $p < 0.0001$), with the

TABLE 1 | Sociodemographic data of participants ($N = 7,928$).

	n	% of responders	mean ± SD
Gender			
Women	5,061	64.4	
Men	2,794	35.6	
No information	73		
Age (years)	1,261		46.0 ± 16.4
Age cohorts			
<21 years	640	8.2	
21–30 years	1,200	15.3	
31–40 years	952	12.1	
41–50 years	1,403	17.9	
51–60 years	2,180	27.8	
61–70 years	1,054	13.4	
>70 years	412	5.2	
No information	87		
Religious affiliation			
Christians	5,789	81.1	
Others	201	2.8	
None	1,150	16.1	
No information	788		
Frequency of spiritual practices			
Meditation	3,385		0.99 ± 1.17
Praying	3,379		1.30 ± 1.31
Perception of the sacred (DSES-6)	2,620		22.3 ± 7.4
Wellbeing (WHO-5)	5,395		46.0 ± 16.4

TABLE 2 | Expression of wondering awe indicators in the sample.

		Never (%)	Seldom (%)	Often (%)	Very often (%)	Mean score (0–3)
ED1	I have a feeling of great gratitude.	3.3	19.5	48.7	28.5	2.02 ± 0.78
ED2	I have a feeling of wondering awe.	9.5	36.4	38.6	15.4	1.60 ± 0.86
ED3	I still have learned to experience and value beauty.	1.1	8.7	51.9	38.3	2.27 ± 0.66
ED4	I stop and am captivated by the beauty of nature.	1.8	14.7	44.8	38.7	2.20 ± 0.75
ED5	I pause and stay spellbound at the moment.	4.2	35.6	41.5	18.8	1.75 ± 0.80
ED6	In certain places I become very quiet and devout.	3.2	25.7	44.6	26.5	1.94 ± 0.80
ED7	I stop and then think of so many things for which I am really grateful.	3.6	24.9	46.6	24.8	1.93 ± 0.80

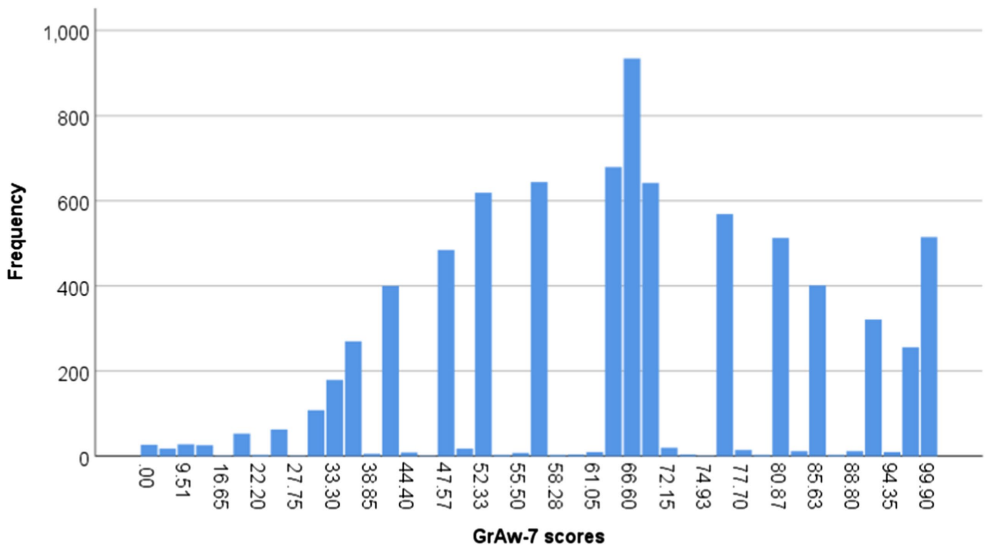

FIGURE 1 | Range of GrAw-7 scores in the sample.

lowest GrAw-7 scores in the younger ones (<21 years: 56.4 ± 22.4) and the highest in the older ones (>70 years: 72.7 ± 17.2; Cohen's $d = 0.80$). Persons with a nominally Christian background have higher scores than those without (66.4 ± 19.5 vs. 62.8 ± 20.8), yet this difference is rather weak (Cohen's $d = 0.18$). However, persons with other religious affiliations had the highest GrAw-7 scores (70.6 ± 18.3); compared to Christians the difference is weak, too (Cohen's $d = 0.22$). Thus, the religious orientation had a small but significant influence on the GrAw-7 scores ($F = 21.6$, $p < 0.0001$).

In a subsample of 5,370 persons, the GrAw-7 scores correlated moderately with participants' wellbeing (WHO-5: r = 0.36, $p < 0.0001$) and in a subsample of 2,613 persons strongly with the perception of the Sacred in daily life (DSES-6: $r = 0.58$, $p < 0.0001$). Frequency of meditation and praying was assessed in 3,886 persons, and the GrAw-7 scores were moderately related with both spiritual practices ($r = 0.43$ and 0.38, $p < 0.0001$). As there is an obvious association between perception of the Sacred in life and frequency of spiritual practices, one may assume that particularly religious brothers and sisters ($n = 371$) and yoga practitioners ($n = 833$) with their specific lifestyles and spiritual practices will have higher GrAw-7 scores than the other persons. In fact, religious brothers and sisters, which are the oldest (mean age: 60.5 ± 13.7 years), had similarly high scores compared to yoga practitioners (72.5 ± 14.8 vs. 74.5 ± 16.5; Cohen's $d = 0.13$), which were much younger (mean age: 49.4 ± 10.3 years), while the scores of the other participants (mean age: 44.8 ± 16.7) were significantly lower (63.8.6 ± 19.9; $F = 141.3$, $p < 0.0001$).

Referring to the categorized frequency of Awe/Gratitude perceptions [low (<45.6), moderate (45.6–85.0), and high (>85.0)], those with low GrAw-7 scores had the lowest age, lowest wellbeing, and lowest spiritual practices, while those with high GrAw-7 scores were the oldest, had the highest wellbeing, and were more often meditating or praying (**Table 3**).

Qualitative Approach

As shown in the empirical data, the frequency of the different indicators of perceived awe differs, with more frequent perceptions of beauty in nature in general than staying "spellbound" at the moment. This would mean that moments of fascination are experienced more often than the more specific perceptions of wondering awe. To analyze the different causes and triggers of a wide range of awe perceptions, a heterogeneous group of persons was invited to describe what caused them to perceive moments of wondering awe. Here, the statement of 82 responding persons was analyzed with qualitative content analysis techniques.

Triggers of Moments of Wondering Awe

Identified triggers of awe can be related to four main categories, *Nature*, *Persons*, *Unique Moments*, and *Aesthetics*, *Beauty*, and *Devotion* (**Figure 2**). In the following, the main categories and their subcategories will be described and representative text passages that served as anchor quotation were added [with anonymized IDs of the person, gender (f for female and m for male), and age].

Nature-Related Triggers

Experience of Nature

This topic has the most entries. Characteristic statements are as follows:

> *"These moments usually happen when I am alone in nature which can be a small garden, a beach, watching a flower, or a landscape of unspoiled nature" (ID41, m, 56).*

TABLE 3 | GrAw-7 categories and relation to age, wellbeing, and spiritual practices.

		Age (years)	Wellbeing (WHO-5)	Frequency meditation	Frequency praying
Number		7,809	5,370	3,379	3,373
Awe/Gratitude perceptions					
Low (15%)	Mean	37.81	11.17	0.34	0.56
	SD	15.90	6.20	0.75	0.99
Moderate (66%)	Mean	46.36	14.49	1.01	1.39
	SD	16.06	5.13	1.15	1.30
High (19%)	Mean	51.20	17.45	1.85	2.01
	SD	15.36	4.69	1.19	1.26
All persons (100%)	Mean	45.99	14.46	0.99	1.30
	SD	16.38	5.55	1.17	1.31
F value		238.2	323.3	264.6	202.5
value of *p*		<0.0001	<0.0001	<0.0001	<0.0001

More specific situations and observations related to nature were described, too:

> *"Most of the time I feel that in or through nature. When I come to the pond one morning and see the empty hulls of the hatched royal dragonflies and then they buzz over the surface of the water. When I see the little frogs watering the flowers. To watch the young tits leave the box and flutter out into the world. The colors of a sunrise that are almost too beautiful to be true. The sea" (ID80, f, 50+).*
> *"As a rule, these impressions are associated with nature in the broadest sense. It can be a beautiful landscape, or the observation of wild animals. I am an enthusiastic rider and when these impressions are still connected to my horse, i.e. when riding, then I often find the feeling overwhelming!" (ID19, f, 56).*

Perceiving the Sacred in Nature

Related to the aforementioned general topic, these perceptions were attribution by several persons to the Sacred in the whole creation, either stated directly or indirectly:

> *"When I see the divine shimmering out of people/animals /plants/beings or the divine in their actions" (ID22, f, 29).*
> *"When I take the ship to a German North Sea island in autumn and the weather is rough and stormy, I am amazed because of the greatness of God" (ID78, f, 73).*
> *"I am amazed again and again by the creative work of nature and that of man. When I see how things have developed which are unbelievably creative, it often touches me deeply (ID21, m, 55).*

One woman interpreted her nature-related perceptions as a hint of God's presence, particularly in depressive states.

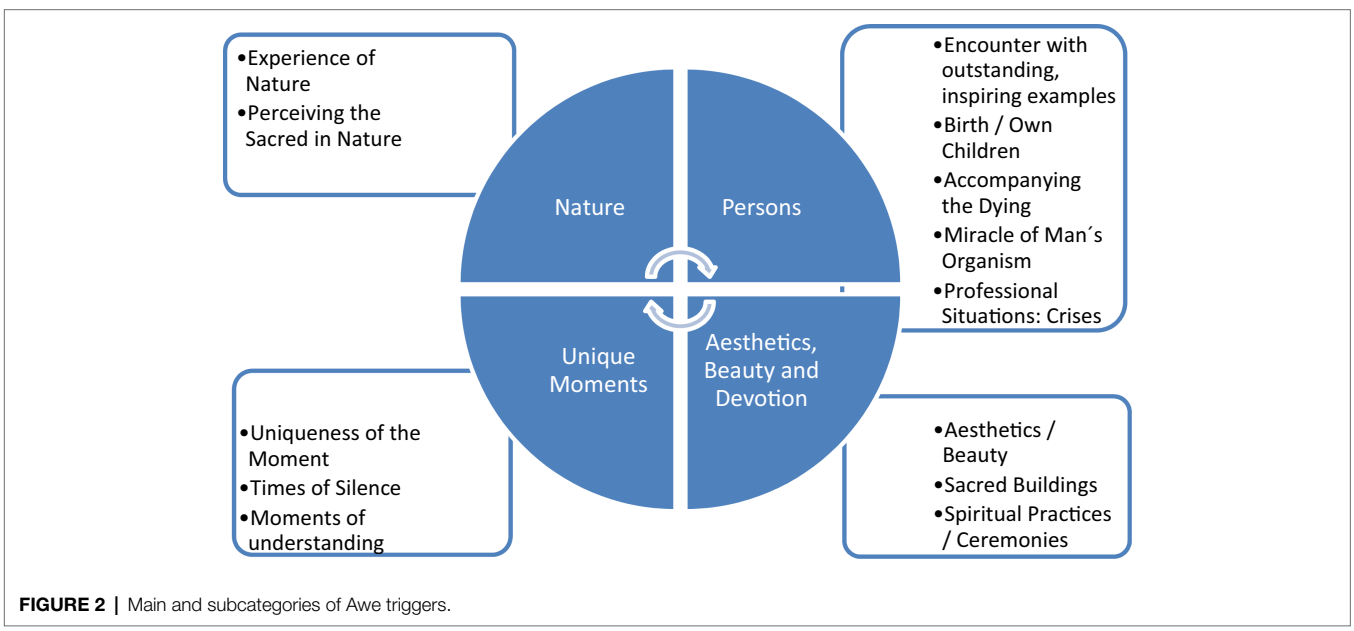

FIGURE 2 | Main and subcategories of Awe triggers.

"In deep personal despair and fear, in the feeling of hopelessness, the perception of a robin, a sunrise, sun-drenched leaves of trees - small light events that have always filled me with astonished awe, because for me they are powerful signs of the no-ifs-and-buts validity of Jawhe's almost incomprehensible promise [to be there for me]" (ID43, f, 65).

One other woman stated that unique perceptions after her work with others reminded her that she is part of "something bigger," without clearly referring it to something transcendent:

"After intensive work - with others, moment of rest, ex. food, and the idea that I am embedded in something bigger" (ID119, m, 56).

Person-Related Triggers

Encounter With Outstanding, Inspiring Examples

Outstanding, inspiring people may also trigger perceptions of admiration or even awe. There are several statements that refer to this category. These persons can be impressive because of attitudes, behaviors, and actions, because of their life experiences, or because of outstanding skills:

"I am full of amazement when a person acts 'superhumanly', such as when a Palestinian father releases an organ of his brain-dead son to the son of an Israeli father. I am in awe when people forgive circumstances (such as the murder of a family member) without a trace of retaliation. I am awesome when people behave altruistically by putting themselves in danger and saving people and animals. I am in awe of the wisdom of old people" (ID15, f, 44).

Older persons and persons in difficult situations can cause moments of respect, admiration, and awe:

"Also with older people who transmit wisdom or younger people in conversations" (ID41, m, 56).
"At patient encounters, when amazing human encounters take place, e.g. how someone deals with an extremely difficult illness: how someone thinks about the world and life and death" (ID163, f, 64).

Important persons can also be members of the own family that helped to care for the children despite own burden:

"Today, on my father's birthday, I think of him with awe and gratitude. In the time of his loneliness as a (widower) he respected us, his growing daughters and helped to understand the maturing life" (ID82, f, 82).

Also admiration of the unique skills of specific persons, either artists, musicians, or poets were categorized here:

"With a 25-year-old pianist in the large concert hall, who played the hardest pieces by heart for 2 h. The musician was still so young and played so confidently and at the same time so humbly, devoted, selflessly… out of the silence - no one who was listening interfered with coughing, etc." (ID 101, f, 59).
"Perhaps most of all with music, for example when I see a musician I admire 'live' and feel that what he/she does is really great" (ID67; m, 69).
"It is also triggered when I hear beautiful music or singing. A great pleasure and astonished pause even with beautiful texts, especially poems, e.g., Rilke" (ID115, f, 70).

Birth/Own Children

The birth of a child was stated as a trigger of awe by some persons, not because of specific abilities or behaviors, but because of their simple presence and unique "wonderful" part of their life:

"I was able to attend a birth. Amazed awe to hold a little new living being 'human' in your hands! You cannot do that, it's a gift" (ID9, female, 71).
"Immediately after the birth of our first child, there was such an unexpected moment of 'wondering awe'. This lasted extremely for a few minutes and then more and more weakly for several days. This feeling was also present at the birth of the second child, but weakened more quickly" (ID150, m, 54).

Also living with the own children and attending their development causes moments of wondering awe:

"Such moments are also familiar to me in everyday life with my child. Reaching for a toy for the first time, discovering your own toes and fingers, but also now (he's now 8) watching my child, hearing how much wisdom, sincerity, clarity and compassion there is in this little person" (ID145, f, 37).

Accompanying the Dying

Not only birth can be a trigger of awe, but also being with dying persons. These encounters were touching because the dying persons shared their experiences, and respondents were able to assist them:

"In the face of dying/death - when a whole life is decided. Death as something great" (ID 99, m, 55).
"In the great moments of meeting patients, when they have invited me into their life, which was often enough determined by suffering, misery, despair, fear of death, and succeeded in helping them to give them a little bit of hope, discovered a little joy, a little gratitude in looking back at their life. This given premonition of being loved nonetheless has changed these people" (ID43, f, 65).

Nevertheless, these moments are also a time of self-reflection, and one person was appreciating the confidence of specific persons and their acceptance of being dying:

"Whenever I feel that death is in wait in a room, I am amazed at the YES of the person concerned. Then I ask myself: - Are you capable of this?" (ID82, f, 82).

Miracle of Man's Organism

This subcategory holds statements "from a distance" about man as a miracle in general. It is a matter of rather cognitive "wonder" how complex the creation and man specifically is:

> *"The human organism - with all the intermeshing of the most varied of processes - to be aware of this causes me to be amazed again and again. Or the development of a little human being - getting up at some point, the emerging speaking and understanding of contexts" (ID130, f, 40).*
> *"As a doctor, when I visualize what always happens so automatically and yet finely tuned unconsciously through our body, cells divide, food is digested" (ID132, f, 35).*

Professional Situations: Crises

Times of crisis triggered moments of awe in some respondents. These can be, for example, a matter of wondering surprise against own professional expectations in terms of healing processes:

> *"If a child is born in an emergency, it has to be reanimated and all parameters are more pessimistic. And then, after a few days and repeatedly for weeks and months, the news comes that the child is healthy and well" (ID109, f, 57).*

One medical doctor described an own moment of crisis when she perceived simple moments of admiration as a hint that God is still at her site, even in times of inner darkness:

> *"The astonished reverence was for this inviolability of the promise and the inventiveness of God founded in love, and that they [she refers to unexpected observations in nature] were also for me at the bottom of life. The question - why did you leave me - but it also implies knowing about you. And that was enough" (ID43, f. 65).*

Unique Moments Related Triggers

Uniqueness of the Moment

Specific situations can trigger such feelings as described by some participants. Several triggers of the aforementioned category, particularly "Birth of the own child" or "Accompanying the dying" or "Crises," could be attributed also to this category. A general statement addresses *"Moments in everyday life, looks, words" (ID162, f, 51)*, while there are also more specific situations. One statement indicates some kind of resonance between therapist and patient:

> *"During rhythmic embrocations on patients when something like non-verbal communication is taking place. There is silence and calm in the room, and something begins to oscillate between patient and practitioner" (ID128, f, 53).*

Times of Silence

Specific times of silence at certain places and also during daily life activities were mentioned, either related to God or not specifically addressed:

> *"Monastery - meeting God in silence" (ID28, f, 56).*
> *"It can also happen spontaneously in everyday life, especially in times of silence or meditation" (ID32, m, 55).*

Moments of Understanding

This category refers to situations and moments which raised specific "unexpected" understanding or "insights" (i.e., of being "part of the creation," gifts are not deserved but nevertheless given, "larger connections") that thereby triggered moments of wondering awe. These "*insights*" (ID32, m, 55) refer to a perception of interconnectedness which may link this topic to the subcategory "Perceiving the Sacred in Creation," too.

> *"In the holm oak forest of a hermitage: silence, old trees, fog, just being in there as a person, and feeling, I am part of creation" (ID9, f, 71).*
> *"The main reasons were the awareness of undeserved gifts. But also the awareness of being carried and chosen by God" (ID20, m, 47).*
> *"Amazed awe occurs when I see larger connections in the world or in my life. Sometimes it happens as a spontaneous insight. Mostly when I read texts or take part in philosophical seminars" (ID32, m, 55).*
> *"There is always amazement and thanks when I look at my life and so many unbelievable connections that emerged in it" (ID115, f, 70).*

Aesthetics, Beauty, and Devotion

Some participants reported moments of admiration and even awe when they perceive music, poetry, ballet, or sacred buildings which have impressed or inspired them, or during specific ritual and ceremonies that have touched them. The sacred buildings are both, a place of admiration and veneration and a place to practice specific rituals.

Aesthetics and Beauty

Here, examples are categorized that go beyond simple admiration of artists as concrete persons, but refer to music or poetry itself which is touching:

> *"When I walked into the Museum of Modern Art in New York and there was a real Matisse hanging in front of my eyes in real size and colors. To really see this in REAL was overwhelming" (ID23, m, 69).*
> *"The incredible beauty of a Bach oratorio. The deep touch that I feel when I hear the Brahms requiem and even more when I sing it. Unexpected changes in harmony that completely surprise me and open completely new doors to the piece [of music] and maybe also to myself. A poem that uses language in such a way that the old words suddenly create something completely new. When language can surprise me, leave the usual path and create something new with inner contexts or its sound and rhythm that is unexpectedly beautiful. Dance. Mainly ballet or artistry" (ID80, w, 55+).*

Sacred Buildings

Specific sacred buildings were mentioned either in terms of the beauty of the building itself or its effects on the person. These can be related to perceptions of connectedness, too. However, it can be also an aesthetical experience of inspiring peace, calm and beauty.

> *"When I came to the Sagrada Familia in Barcelona and was amazed at the format, the colors and the naturalness of the shapes" (ID23, m, 69).*
> *"Large church buildings (feeling of "holiness," respect for centuries-old tradition, feeling of belonging to a large community [of Christians])" (ID18, f, 38).*
> *"Cathedrals especially when they are embedded in the quiet of a landscape. And the sacred can be felt far beyond the narrow confessional references" (ID157, f, 60).*

Spiritual Practices/Ceremonies

Depending on the spiritual background, specific spiritual/religious rituals were mentioned that have triggered feelings of awe by three persons. In case of a yoga practitioner, this feeling was also related to remembering a unique teacher of his tradition, in terms of devotion. However, in that respective situation, it was the ritual which triggers the devotion of the school's guru (his picture is placed at the altar).

> *"Every time in Eucharistic adoration. When receiving the sacraments" (ID20, m, 47).*
> *"In front of an altar during a satsang [spiritual ceremony with chantings] while looking at a picture of Swami Sivananda [the deceased guru of this yoga school] during a puja [ritual of veneration]; in deep meditation" (ID16, m, 56).*

DISCUSSION

Findings of the empirical part of this study underline that the frequency of Awe/Gratitude perceptions is varying strongly. Persons with low Awe/Gratitude perceptions were the youngest and had the lowest wellbeing in the sample, while those with high Awe/Gratitude perceptions were the oldest and had the highest wellbeing. Those who were experiencing awe only rarely (low scores) have wellbeing scores that would indicate depressive states (WHO-5 scores < 13). The causal pathways of this association are unclear. Both concurrent pathways might be true: Persons with low wellbeing (or depressive states) experience awe less intensive, while persons who are unable to stop for moments of wondering awe (because they are too busy) might be "happy" but not satisfied with their life. Such associations were already described (Büssing et al., 2020a, 2021e), but not their causality. Although women scored significantly higher than men, gender had only a weak influence on awe perceptions, while the negative age-related effect could be attributed either to different life experiences in older persons and thus higher sensitivity for "important moments" in life or to another focus in the life of younger people, for whom other things in life are more important than for the elderly. As shown in previous studies, too (Büssing et al., 2020a, 2021a), GrAw-7 scores were moderately related to participants' frequency of meditation and/praying, indicating that these spiritual practices may sensitize the awareness for moments of wondering awe. In fact, religious brothers and sisters and also yoga practitioners with their specific lifestyles and their regular spiritual practices had the highest GrAw-7 scores. This would indicate that the perception of awe could be either trained by spiritual practices or is part of this spiritual development process during the practice. This could be seen as a matter of embodied mindfulness resulting in feelings of gratitude, reconnection with own values and spiritual beliefs, too (Poletti et al., 2019). Therefore, these practices could be a relevant resource to perceive the world around and the given situations more mindfully aware.

During the COVID-19 pandemic, the perception of Awe/Gratitude was related best with positively perceived changes in terms of Nature/Silence/Contemplation and Relationships, while it was only marginally associated with participants' perceived burden – and is thus not a buffer against burdening situations (Büssing et al., 2021a). Interestingly, Awe/Gratitude mediated the effect of Nature/Silence/Contemplation as a predictor on participants' wellbeing as an outcome (Büssing et al., 2021a). Thus, the ability to remain in contemplative quietness and silence and to mindfully perceive nature contributes to a person's wellbeing, which is mediated by the ability to experience Awe/Gratitude. During the COVID-19 pandemic, it was observed that the positively perceived changes in terms of Nature/Silence/Contemplation started to slowly decrease along with Awe/Gratitude after the first lockdown and the summer period and strongly declined during the second lockdown with its burdening restrictions, while wellbeing and stressors remained stable in the first phase and changed during the second lockdown. This would indicate that the decline of Awe/Gratitude preceded the decline of wellbeing; yet, Awe/Gratitude predicted only 9% of participants' wellbeing variance (Büssing et al., 2021a) and is thus not the main relevant influence.

During the pandemic, GrAw-7 scores were much lower in tumor patients (mean score 57.4 ± 20.2; Büssing et al., 2020a) compared to non-diseased persons (66.8 ± 17.9; Büssing et al., 2020b). At that time, 35% of tumor patients (Büssing et al., 2020a) and 30% of non-diseased persons (Büssing et al., 2020b) had wellbeing scores that would indicate rather depressive states (WHO-5 scores < 13). Both variables are connected, but the causal direction is unclear. In that sample of tumor patients, Awe/Gratitude was weakly related to the presence component of meaning in life directly after the first lockdown (MLQ) and moderately at the start of the second wave of the pandemic – and having meaning in life contributed to their wellbeing (Büssing et al., 2020a, 2021e). However, in tumor patients meaning in life predicted their wellbeing only to some extend ($R^2 = 0.12$), but not Awe/Gratitude. It seems that the perception of Awe/Gratitude is a relevant dimension related to a person's meaning in life and prosocial behavior, while it is not a direct aspect of their quality of life. It is rather an ability to nevertheless perceive the positive aspects in life – despite restrictions (in terms of the COVID-19 pandemic or illness).

As nature-related perceptions were the easiest approach to perceive moments of wondering awe, these are primarily addressed in the research instruments. However, there might be other triggers of awe that could be of relevance for specific persons and situation. Here, qualitative approaches are suited to address these further triggers and causes and also individual interpretations. The perception of beauty in nature was stated by most participants in the qualitative approach, and it was the most frequent theme in the study of Yaden et al. (2019), too. Yet, the qualitative analyzes revealed a wider range of awe triggers, encompassing, for example, Experience of nature, Perceiving the sacred in nature, Encounter with outstanding, inspiring people, Birth/own children, Accompanying the dying, Professional situations/Crises, Times of silence, Art, Music, and Poetry, Sacred buildings, and Spiritual practices/ceremonies. These can be assigned to four main categories, (1) Nature, (2) Persons, (3) Unique Moments, and (4) Aesthetics, Beauty, and Devotion, with their respective subcategories. However, some of the perceptions related to skilled persons may be more a matter of admiration than wondering awe, while in the case of the yoga practitioner, it seems to be a matter of devotion toward the yoga lineage's guru during a spiritual ceremony. In the empirical study of Yaden et al. (2019), we find some shared themes, that is, persons with "Great skills," "Great virtue," or "Powerful leaders" and also "Music," "Art," and "Buildings or Monument" (Yaden et al., 2019); their theme "Grand theory or Idea" may find some similarities in our subcategory "Moments of understanding"; their theme "Encounter with God" cannot easily be related to one of our subcategories. They further stated that some persons mentioned "childbirth as a trigger for intense awe experiences," and this topic was found in our study, too. However, in our qualitative approach, several others topics appeared which are not found in the categories mentioned by Yaden et al. (2019), that is, "Accompanying the Dying" or "Crises" in life, the experience of a moment's "Uniqueness" and also "Times of Silence," further "Perceiving the Sacred in Nature," and additionally "Spiritual practices/ceremonies." It is thus obvious that the range of awe triggers is wide and that there are different chances to be "touched" and moved by these encounters, also during times of crisis. This aspect is of relevance as this would argue against the suggestion that wellbeing is the necessary prerequisite of the ability to perceive moments of wonder and awe. Indeed, in tumor patients, depressive symptoms were negatively related to their trait mindfulness, and this link was mediated by their perceptions of meaning in life (Hsieh et al., 2021). Although one may disagree, in terms of art *per se* and performing artists, it was suggested that these are appreciated or admired because of their skills and that art is a starting point to "wonder," but it is not necessarily a matter of awe (Fingerhut and Prinz, 2018). Some of the mentioned perceptions may have no relevant effects on the life of the respective persons (the small moments of appreciation or fascination), while other perceptions may be more profound and will result in changes of a person's attitudes and behaviors. Gallagher et al. (2015) described that astronauts "have reported experiences that are deeply aesthetic, spiritual, or sometimes religious." These perceptions are of course extraordinary and thus go beyond everyday experiences. In consequence, rather outstanding experiences and perceptions than small moments of fascination may trigger processes of change in terms of a person's values, attitudes, and behaviors and can also result in processes of "spiritual transformation" (Keltner and Haidt, 2003; Ironson and Kremer, 2009; Kremer and Ironson, 2009; Cohen et al., 2010; Büssing et al., 2018b; Penman, 2021). Gallagher et al. (2015) stated that the above-described astronauts' experiences resulted in higher spiritual sensitivity, that they were "more attuned ecologically or ethically after their return to Earth," and further that "these experiences have been life transforming" for some of them. In this context, the "spiritual" is not meant as something beyond our sensory experiences (transcendent), but as something immanent. Nevertheless, some persons may interpret these experiences in the context of their worldview and religious faith, as it was reported particularly by religious persons in in the qualitative analyses.

Further outcomes of such processes of change can be lower stress perception, mental stability, better coping strategies, finding new meaning in life, optimism, substance-abuse recovery, and increased spirituality (Ironson and Kremer, 2009; Kremer and Ironson, 2009). As the perception of Awe/Gratitude is also related to prosocial behaviors (Piff et al., 2015) and mindful encounter and care for the environment and persons in need (Büssing et al., 2009, 2013, 2014), similarly to the findings of Gallagher et al. (2015), this would be a further argument to foster this resource, as it contributes to a person's meaning in life and wellbeing (Rudd et al., 2012; Krause and Hayward, 2015; Zhao et al., 2019; Aschoff, 2021; Büssing et al., 2021a).

Limitations

With respect to the empirical approach, different data sets using the GrAw-7 scale were combined, while, however, not all utilize the same additional instruments (WHO-5, DSES-6 or frequency of spiritual practices). Therefore, the number of participants is not the same for the respective correlation analyses. As responding to the DSES-6 requires a theistic religious belief, the scale was used only to underline convergent validity of the GrAw-7 scale (which does not require belief in God) in a subsamples of participants. Further, the data are cross-sectional, and thus, the causality of interactions remains unclear. Despite the relatively large sample size, we cannot guarantee that the data are representative for the general German population. Particularly, the two specific subsamples of religious brothers and sisters and of yoga practitioners were exclusively recruited as "positive perception" samples which are not representative for the general population.

With respect to the qualitative approach, the participants were invited to respond by email. Although it was assured that the responding emails were directly deleted and no identifying data were recorded, some may have been reluctant to send their responses back. One may further assume that particularly persons have responded who have an interest to state their usually positive experiences, while those who may assume that their experiences are either "too small" to report,

not important enough or even negative might not have responded. Therefore, the number of participants was raised in order to achieve a larger set of different awe perceptions. Further, it cannot be excluded that persons from other cultural or religious societies may perceive moments of wondering awe differently than the German sample and that they may state other triggers, too.

CONCLUSION

What is the "spiritual" aspect of perceiving moments of wondering awe? First, touching experiences that transcend the conventional experiences can induce processes of inner change (Cohen et al., 2010). These transformation processes can be small or more profound; the small ones could be seen in terms of mindful awareness without any relevant consequences, while the more deep impact perceptions may trigger new insights, attitudes, and behaviors. For both perceptions, causes or triggers are required, and these might be very heterogeneous and differentially perceived by different persons. As shown in this analysis, these triggers may be related to *Nature*, *Persons*, *Unique Moments*, or *Aesthetics*, *Beauty*, and *Devotion*. Some of them have a transcendent (non-materialistic) connotation, and others are concrete. The experiential and perceptive aspect might be crucial instead of adopting inherited experiences of others or adopting religious concepts for which no personal experience is available (belief systems). Here, the concept of transcendentality could enhance the view (Khachouf et al., 2013), as mindful states are first a matter of awareness that does not require external stimuli or a "perceptor," but are nevertheless perceived on the other hand. Regular contemplative practices, which facilitate awe perceptions, may change "the provisional quality of our conceptual structure," as suggested by Khachouf et al. (2013) and may thus change the behaviors and creativity. Second, these perceptions of wondering awe imply an openness to new experiences that may "emotionally touch" a person. Whether this experience is interpreted in the light of specific religious or non-religious frameworks and individual mindsets indicates whether it is seen as "trans-personal" or not. More relevant is the consequence of being "touched" in this way and by which trigger and how it is contextualized, as these factors influence putative spiritual transformation processes resulting in more conscious interactions with others and the world around, more caring and compassionate behaviors, new meaning in life, and a deepening of specific practices or rituals (i.e., mediation, praying) that are considered to connect to transcendent or immanent resources of hope (Büssing et al., 2018b; Büssing, 2019). With respect to these moments of wondering awe and subsequent feelings of gratitude, it is important to underline that this experiential aspect of spirituality is perceived by both, religious and non-religious persons – although stronger by persons with a dedicated religious or spiritual lifestyle and related practices. Nevertheless, also non-religious persons are "touched" by the beauty of nature and may perceive the "Sacred" in specific situations and moments, and also, these persons may change in terms of transformation processes. Yet, this does not exclude the possibility that religious persons interpret the same perceptions of wondering awe in terms of their belief system (i.e., that God is present in all things and can thus be experienced in nature, and also in other persons), and thus, the GrAw-7 scores are strongly related to the perception of the Sacred (God) in their life. Nevertheless, Gallagher et al. (2015) underlined that "awe and wonder are experiences that transcend

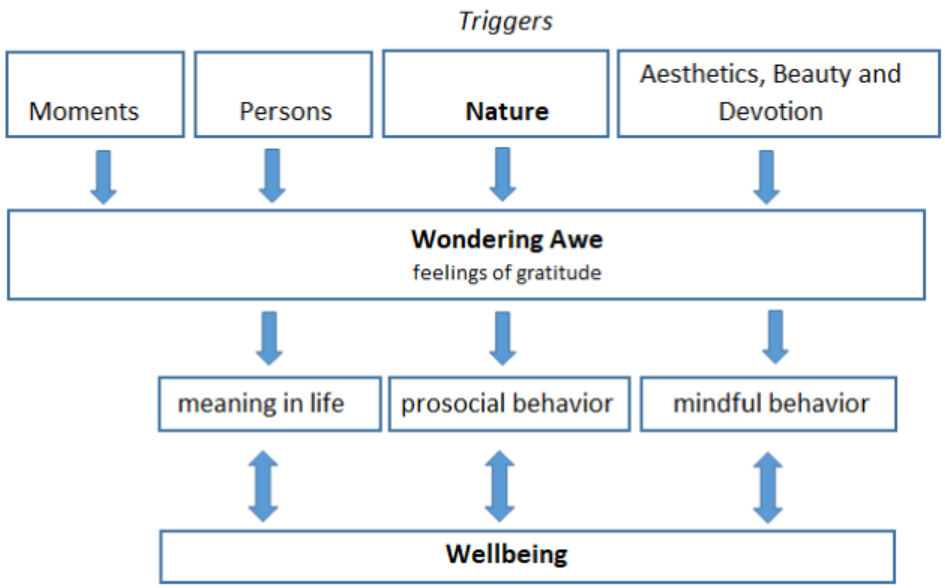

FIGURE 3 | Putative pathways of awe triggers and related outcomes.

religion, culture, politics." This requires openness and an ability to go "outside of ourselves to explain or understand our senses of awe and wonder" (Gallagher et al., 2015).

For healthcare professionals, this indicator of spiritual sensitivity could be an approach to implement the underlying ability to perceive the nevertheless beautiful and unique moments even in difficult life situations, both in their patients and in themselves, in terms of a coping process and to draw attention to what is still valuable and special in life. Mindful approaches, such as yoga and meditation, but also autobiographical narratives, art, and writing, could be useful. Perceiving moments of wondering awe will not directly influence a person's wellbeing, but probably in terms of interaction processes that enroll different interacting variables (**Figure 3**).

DATA AVAILABILITY STATEMENT

According to the data protection regulations, the dataset cannot be made publicly available. Data are however available upon reasonable request.

ETHICS STATEMENT

Ethical review and approval was not required for the study on healthy human participants in accordance with the local legislation and institutional requirements. Participants were informed about the study purposes, guaranteed confidentially, and they consented to participate by filling the anonymous questionnaires, which were applied in most cases online. Neither identifying personal details nor IP addresses were recorded to guarantee anonymity.

AUTHOR CONTRIBUTIONS

AB designed the study, set up the online survey, undertook all analyses, and wrote the manuscript.

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Smartphone Time Machine: Tech-Supported Improvements in Time Perspective and Wellbeing Measures

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Individuals with a balanced time perspective, which includes good thoughts about the past, awareness of present constraints and adaptive planning for a positive future, are more likely to report optimal wellbeing. However, people who have had traumas such as adverse childhood experiences (ACEs) are likely to have less balanced time perspectives and lower overall wellbeing when compared to those with fewer or no ACEs. Time perspective can be improved via *time-travel narratives* that support people in feeling connected to a wise and loving future version of themselves, an approach that has until now only been provided in counseling contexts. Our team used an iterative inclusive design process to shape a scalable time-travel narrative tool – a responsive and progressive web application called *Time Machine.* Among other functionalities, Time Machine allowed people to record and listen to messages as if they were from and to their past and future selves. Using pre-planned as well as *post-hoc* analyses, we analyzed quantitative and qualitative data from 96 paid design partners (participants) who were taken through a 26-day pilot study of the technology. Among other effects, the results revealed: (1) high engagement throughout the design process, (2) improvements in self-reported time perspective and overall wellbeing scores that were greater for those using Time Machine during an optional-use period, (3) twice as much improvement in overall wellbeing scores for design partners with high ACEs (16%) versus low ACEs (8%), and (4) feelings of unconditional love apparently mediating the relationship between scores on time perspective and overall wellbeing measures. We discuss the limitations of these results as well as implications for the future role of spiritually informed scalable time-travel narrative technologies in healthcare and wellness.

Keywords: time perspective, wellbeing, transcendence technology, adverse childhood experiences, mental time travel, hope, unconditional love, prospection

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INTRODUCTION

The ideal time perspective has been a topic of popular discussion for centuries. For instance, two forms of time were personified by the Greeks: Kronos vs. Kairos; these are similar in meaning to two Hindu words for time, Kala vs. Ritu (e.g., Makridakis, 2012; Lindley et al., 2013; Valentine, 2020). According to these accounts, Kronos/kala both refer to the externally measured chronological

aspect of events, while Kairos/ritu both refer to the internally measured, subjectively experienced aspect of events. Meanwhile in recent academic philosophy, an argument has emerged in which some philosophers state that a fully rational human would have no temporal bias; for instance, a rational human would have no preference to have the bad things in life behind us and the good things ahead of us, because we are always the same person having the experience (Sullivan, 2018). Another philosophical camp states that it is both reasonable and common to have temporal biases such as these, or in any case that such temporal biases can be rationalized (Greene et al., 2021).

Beyond these philosophical speculations, recent interest in the impact of time perspective on human wellbeing has been rekindled by empirical investigations motivated by the recognition that subjective wellbeing and positive affect are related to one's relationship to the temporal features of one's own life (Zimbardo and Boyd, 1999; Boniwell et al., 2010; Zhang et al., 2013a; Stolarski, 2016; Cordonnier et al., 2018; Salgado and Berntsen, 2018; Sanson et al., 2018; Jankowski et al., 2020). For instance, "mental time travel" can be used to prospectively "pre-live" events based on templates from past experiences, and in fact such future-focused mental time travel has been found to be generally more positive and evocative than mentally visiting past events to direct behavior (Sanson et al., 2018). This could be due to a positivity bias when it comes to near-term future prospection (Salgado and Berntsen, 2018), which may arise because memories of actual events constrain our re-representations of the past, but not the future (Cordonnier et al., 2018). What has been called a "balanced time perspective" represents an intricate interplay between realistic and positive awareness of the past and present combined with willingness to hope and plan for a realistically positive future. Those with more positive and less negative thoughts about the past, non-fatalistic thoughts about the present, and a greater frequency of future-engaged thoughts are more likely to rank themselves as optimally functioning, having greater wellbeing, experiencing less negative affect and more life satisfaction than those who do not share this balanced time perspective (for review, see Jankowski et al., 2020).

For depressed adolescents and adults, realistic optimism and strong future orientation have been associated with decreased depressive and suicidal symptoms (Puskar et al., 1999; Gillham and Reivich, 2004; Hirsch et al., 2006, 2007, 2009; Chang et al., 2019). Among under-resourced youth, violence decreases as future orientation improves over time (Stoddard et al., 2011), robust future orientation has been considered a protective factor in high-violence communities (So et al., 2018), and among abused youth, future orientation improves as resources improve (Oshri et al., 2018). Further, future time perspective predicted the success of inmates in a vocational training program (Chubick et al., 1999). But a balanced time perspective is not isolated to the future. For instance, research on daydreaming indicates that dreams of a very positive future that do not match at all our present circumstances — as in "I'm sick with cancer now but tomorrow I'll be well," — actually increase depression, even though the fantasies seem to induce some happiness in us (Oettingen et al., 2016).

Not surprisingly, our time perspectives are informed by our experiences. For example, in one study, people with post-traumatic stress disorder from a car accident experience had levels of PTSD that were partially remediated by having a more balanced time perspective (Stolarski and Cyniak-Cieciura, 2016). Further, in an examination of lifetime exposure to trauma and optimism for the future, deviations from a balanced time perspective partially mediated the relationship between more trauma exposure and less optimism (Tomich and Tolich, 2021). The broader implication of such studies is that those of us who have experienced trauma but have balanced time perspectives may be more likely to report higher overall wellbeing than those who have experienced trauma but have a time perspective that deviates greatly from optimal balance. Thus interventions that move people toward a balanced time perspective could be beneficial, especially for those who have experienced trauma.

Time perspective does seem amenable to intervention, sometimes leading to increases in wellbeing or other positive correlates of a balanced time perspective. Research in positive psychology has shown that a narrative approach can be an empowering tool for positive change (White and Epston, 1990; Zimmerman and Dickerson, 1996; Sheldon and Vansteenkiste, 2006). Some practitioners and researchers have used what we call "time-travel narratives," in which people are coached to use ideas about past and future versions of themselves to create more balanced time perspectives and achieve positive behavioral changes, both within therapeutic contexts (Newsome, 2004; Kress et al., 2008, 2011; Hoffman et al., 2010; Palgi and Ben-Ezra, 2010; Madden et al., 2011; Palgi et al., 2014) and outside of them (Hall and Fong, 2003; Schuitema et al., 2014; Snider et al., 2016). However, research on the efficacy of time travel narratives as an independent intervention not accompanied by other coaching or therapies is in its infancy, probably because it is expensive to target in-person interventions to a large number of appropriate individuals.

Following the recent trend of making evidence-based positive psychology tools available via scalable mobile and internet applications (Mossbridge, 2016; Diefenbach, 2018; Kitson et al., 2018; Miller and Polson, 2019), we set out to create an affordable, accessible, evidence-based, self-administered, time-travel narrative technology designed to balance time perspectives and potentially improve wellbeing. We define a time-travel narrative technology as any scalable tool that helps people build the habit of working to heal negative memories of the past and weaving an engaged present into their hopes and goals for a positive future. We were especially focused on co-designing the technology with those who had experienced trauma, including abuse, addiction, poverty, incarceration, and neglect. This is because in our previous experience with evidence-based technology development, we had become acquainted with the principle that when technology is not designed by the intended beneficiaries, the technology ends up not being beneficial (McGuinness and Schank, 2021). Thus we had two aims for this pilot study: (1) create an inclusive design process to support the creation of a prototype time-travel narrative tool, and (2) test the efficacy of this prototype. Our primary research questions were whether our inclusively designed prototype could

support people in balancing their time perspectives, increasing feelings of unconditional love [as defined in Mossbridge et al. (2021); see Methods "Recurring Assessments (Study Days 2, 8, 14, 25)"], and improving measures of physical and overall wellbeing. Here we offer an overview of the inclusive design process as well as quantitative and qualitative results that shed light on these questions.

MATERIALS AND METHODS

Procedure

Focus Groups and Demographics Survey Completion

To reach our first aim of creating an inclusive software design and testing process, we invited all screened and consented participants to a ∼1.5-hour online (Zoom) focus group. The first and last authors (JM and MS) facilitated each focus group. During the first 30 min of each focus group, the first author briefed the participants on the scientific background, the overall study design, and their important role as design partners. Then we gave the design partners a link to an online demographics survey and the Adverse Childhood Experiences Survey (ACES; Felitti et al., 1998). After these surveys, the last author led the design partners in a 15–20 min time travel narrative meditation, in which they were encouraged to imagine visiting a past and a future version of themselves, and were especially encouraged to imagine being loved by their future self. After this meditation, both facilitators shared how time travel narratives like this one have helped them. Finally, we opened up the meeting for a 20- to 30-min period during which design partners debriefed from their experiences and asked questions about the technology and the study. During the entire focus group, we supported the sharing of private information only when design partners left their video and audio feeds off, created anonymous screen names, and knew how to privately communicate via the chat window to the two facilitators. When the debriefing seemed complete and all questions were answered, our design partners were reminded of the payment schedule, the fact that they could drop out at any time and receive prorated payment for the work they had already done, and the fact that they could take as long as they like (up to 5 months) to complete the 26 days of the study.

Technology Development

Our second aim was to design, build and test accessible and scalable software to engage our population in a time travel narrative task ("recording task") and compare the benefits of engaging in that task, if any, with benefits derived from a control task ("quote task"; **Figure 1** and below). We chose a browser-based progressive web application coded in JavaScript, CSS and HTML 5+ with a Firebase backend; we decided not to create a pre-packaged mobile app so the technology could eventually become available to incarcerated people who are more likely to have access to the internet without access to mobile apps. Our design, development, and project management leads (AW, KJ, and PW, respectively) created and executed an iterative roll-out process that allowed us to continually update design and functionality throughout the study without altering any of the primary scientifically important aspects of the technology. This allowed us to respond to feedback from design partners about features they would like to see in future iterations of the technology. This "Time Machine" technology used a "dashboard" approach to present four components to our design partners: efficacy tracking, the recording task, the quote task, and wellness checks. All three were timed as "to-do" items on the dashboard, and all followed the study schedule. Design partners could skip days and put the study on hold for up to 4 months, but the technology required them to complete all 10 days of the experimental and control conditions and all required surveys if they chose to remain in the study. Each component was presented to the user at the required time, according to the study timeline (**Figure 1**). Each of these components are described below.

Efficacy Tracking

To measure the efficacy of the technology, we used a between-groups crossover design. The Time Machine software randomly assigned design partners to one of two groups: recording-first group (N = 52) or quote-first group (N = 44; **Figure 1**). The experimental condition was the recording task (see below) and the control condition was the quote task (see below). The four dependent variables were the linear deviation from a balanced time perspective (see section "Data Analysis") and responses to questions related to physical symptoms of stress, feelings of unconditional love, and overall wellbeing (see Surveys). These variables were calculated from responses to each of the four recurring assessment surveys administered on days 2, 8, 14, and 25 (see surveys, below), which were administered on a HIPAA-enabled survey site (FormSite) launched from the dashboard of the Time Machine. The independent variables were the ACES score taken from the survey administered during the focus group (day 1; see Surveys), group (task order), and the number of logins to the Time Machine during the 10-day unpaid optional period of the study. To ensure private and accurate storage of information pertinent to each design partner, FormSite received a hashed version of the design partner's identity via the URL used to launch the survey site, and passed back to Time Machine a confirmation that the design partner had completed a survey. However, no survey responses were stored within the Firebase database.

Recording Task

The recording task was a self-guided scalable replication of a time-travel narrative. Design partners were asked to record a message to their past and future selves, and then send the message into their time machine. The next day, design partners were given access to the previous day's message from the time machine and asked to listen to their message with love for themselves. They were not instructed how to do this, but were asked to try to imagine doing so. The aim of the recording task was to help give our design partners a daily reminder that they are continuously existing entities, that they are getting through each day and moving onto the next, and that they can develop a positive relationship to their internal representations of their future selves. During the focus group, this task was described as the task that was most like the guided meditation conducted during the focus group, so our design partners were aware that this task was of most interest to us (i.e., they were not blind to the study design).

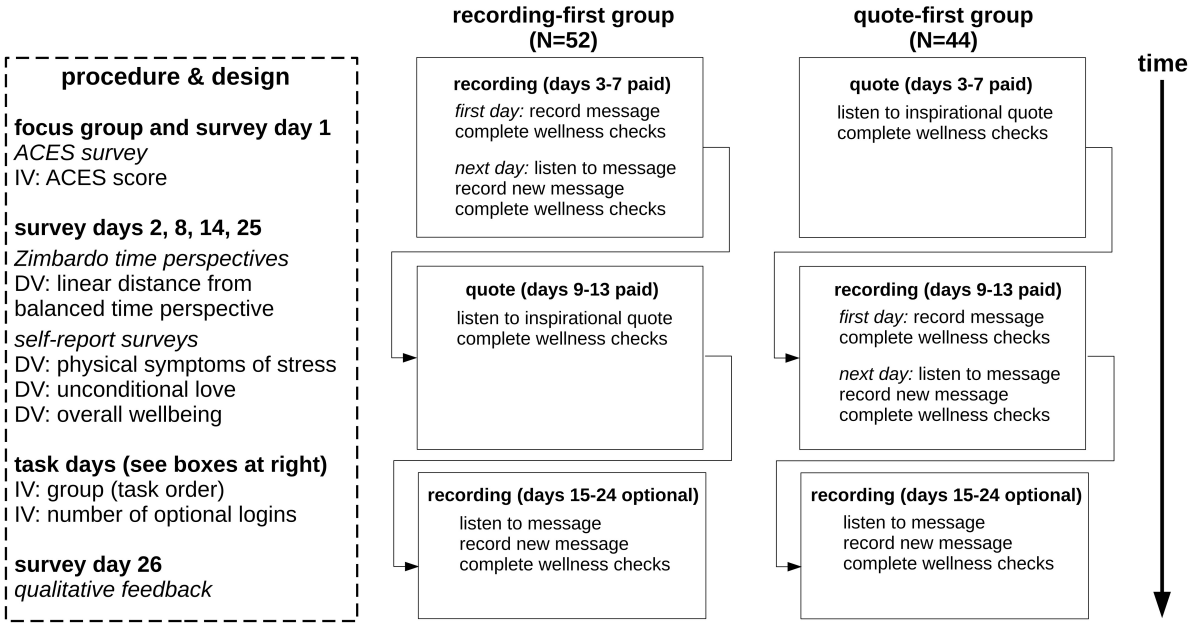

FIGURE 1 | Schematic of study design. We used a crossover design comparing two task orders (recording-first, quote-first). All 96 design partners engaged in all required (paid) days, spread over as few as 26 days (shortest time frame) to 5 months (longest time frame). ACES = Adverse childhood experiences study.

After the first recording was made, no advancement in the study was allowed without playing the previous day's recording and pressing a button stating "I'm Done."

Quote Task

In the quote task, design partners were encouraged to listen with love to randomly selected recording of one of our project staff reading an inspirational quote. The quote being read was also shown on the screen. This task was meant to be as close to the recording task as possible without presenting the design partner with their own voice and without relating to past or future selves. In this way, it controlled for the act of being encouraged to listen to positive words with love. No advancement in the study was allowed without playing the recording and pressing a button stating "I'm Done."

Experimental Wellness Checks

Wellness checks consisted of three animated sliders presented in this order: physical, emotional, and spiritual wellness. To boost engagement, we allowed design partners to discover that moving the sliders to the right (highest score: 10) produced animated positive changes in the graphics for each slider, while moving the sliders to the left (lowest score: 0) produced animated negative changes (**Figure 2**). These wellness checks were presented right after design partners completed their recording or quote task on any non-survey day. No advancement in the study was allowed without completing the wellness checks for that day; the default position for each slider was in the middle of the screen. Because of the experimental nature of the wellness checks, responses were not included as part of the formal set of dependent variables, but we present analyses of the data they produced regardless (see section "Results").

Hypotheses

We tested five hypotheses in this pilot study. All tests of these hypotheses were pre-planned.

Hypothesis 1. Measures of time perspective, physical symptoms of stress, unconditional love, and overall wellbeing (i.e., all dependent variables) will improve from the first to last days of the study for participants who use the Time Machine technology for the required study period.

Hypothesis 2. Individuals who perform the recording task prior to the quote task will show greater improvement from the first to last days of the study in all dependent variables than participants who perform the tasks in the reverse order.

Hypothesis 3. All dependent variables will initially be better (more adaptive) for individuals who report relatively lower versus higher numbers of ACES.

Hypothesis 4. Individuals with lower numbers of ACES will report greater improvement from the first to last days of the study in all dependent variables than individuals with higher numbers of ACES.

Hypothesis 5. Improvements from the first to last days of the study in all dependent variables will be greater with greater use of the technology during the optional study period.

Design Partners (Participants)

All design partners were asked to read and sign an online consent form. No design partner was invited to the online focus group or given access to the time travel narrative technology unless they consented. Human subjects protocols and consent processes were

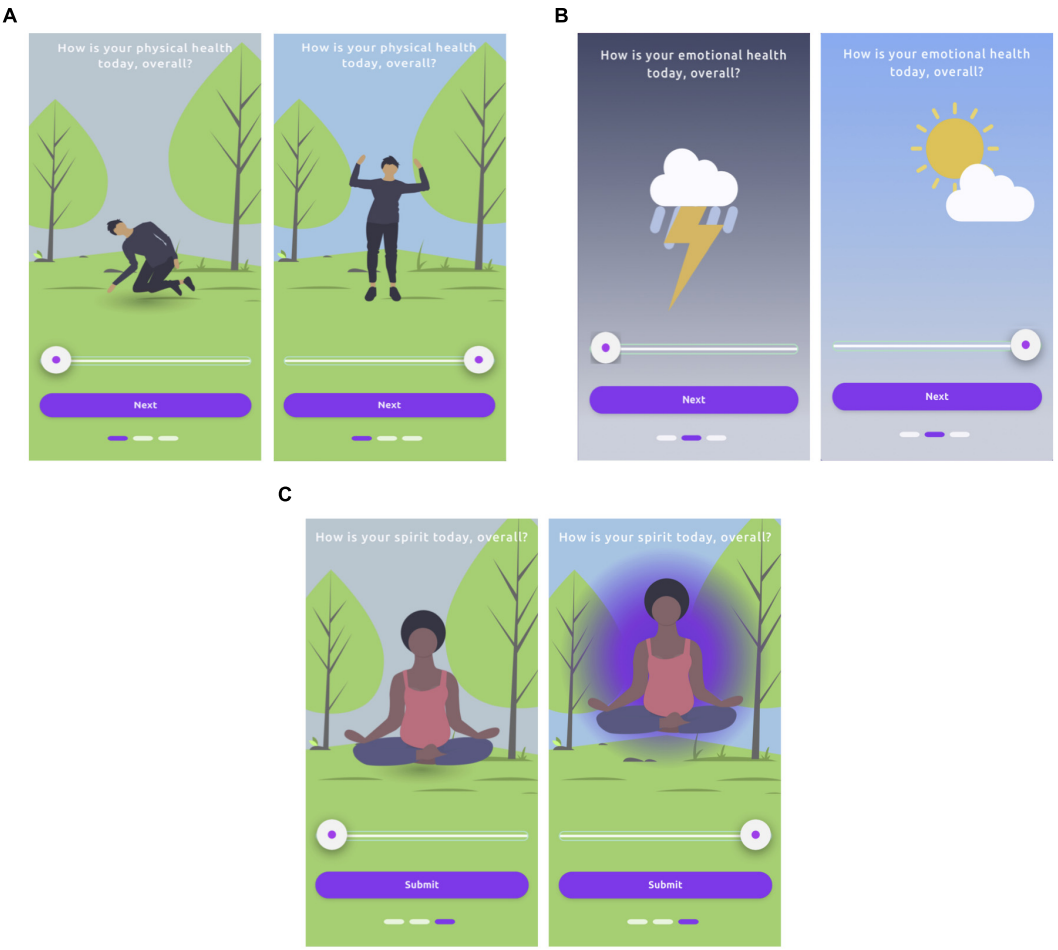

FIGURE 2 | Wellness check sliders showing discoverable animations indicating meaning of slider positions; left = low rating and right = high rating in all cases. **(A)** physical, **(B)** emotional, **(C)** spiritual. Three rectangles at the bottom of the screen indicate slider progress. All three sliders were required to be moved before a task day (or non-survey day) was considered complete; default position was center. We analyzed data from these wellness checks, though they were not among the formally defined dependent variables.

approved by the Institute of Noetic Sciences Institutional Review Board under approval number MOSJ_2020_01. From August 1, 2020-Dec 15, 2020 we enrolled 104 design partners in the study. Nineteen were recruited as a result of social workers and addiction counselors distributing our flier, the remaining were pre-screened with a survey advertised on Amazon Mechanical Turk (mTurk) and Turker Nation, the Slack community for "Turkers" (workers on mTurk). The pre-screening included all the demographics and ACEs questionnaire information that was also requested on day 1 of the study (see below). The pre-screening screened out non-native English speakers as well as participants who reported neither adverse childhood experiences nor belonging to any traditionally under-resourced group (non-white, LGBTQ+, disabilities, incarceration, United States military service). All participants were over age 18, but beyond that cutoff requirement no further age information was requested from participants. Participants in the pilot study participated in 3–4 total engagement hours over 26 days, with 16 days in which engagement was required. The remaining 10 engagement days were optional. Each design partner who finished the entire experiment received $180. No design partner chose to withdraw from the study and receive prorated payment.

Efficacy Tracking Surveys

Figure 1 gives a schematized version of the efficacy tracking timeline and study design; here we briefly describe each survey.

Focus Group and Demographics (Study Day 1)

On the first study day, design partners attended the 90-min focus group, completed a modified ACES inventory {described in Felitti et al. (1998), validated in Murphy et al. (2014) [Chronbach's alpha = 0.88]} with non-required responses asking permission to ask questions about a particular form of abuse prior to providing those questions, as well as: "What is your race/ethnicity?" (open text field), "What is your gender?" (open text field), "Do you identify as LGBTQ+?" (yes/no), "Do you have disabilities that have affected your life?" (yes/no), "Do you have a history of incarceration?" (yes/no/somewhere in between ["somewhere

in between" scored as yes]), "Have you ever served in the United States military?" (yes/no).

Recurring Assessments (Study Days 2, 8, 14, 25)

The recurring assessment was performed four times during the course of the study, and contained four measures:

(1) The brief Zimbardo time perspective inventory [as described and validated in Zhang et al. (2013b); test-retest validity 0.73, mean 0.78 correlation with longer Zimbardo measure]. Scores on this measure were used to calculate the deviation from a balanced time perspective (see Data Analysis, below). In the present study, test-retest validity averaged 0.70.

(2) A physical symptoms of stress scale with time frame over the past 3 days [as used and described in Lee et al. (2010) and originally developed by Patchen (1970) but not validated]. As in Lee et al. (2010), physical symptoms of stress were: headache, upset stomach, gas or bloated feeling, and trouble getting to sleep. Participants used a 4-part scale to rate the occurrences of each symptom (0, 1, 2, or 3+ times), and the sum of the occurrences (with 3 points for 3+ times) was used as the score. In the present study, test-retest validity averaged 0.67.

(3) A feelings of unconditional love scale with time frame over the past 3 days [as used and validated in Mossbridge et al. (2021); test-retest validity mean of 0.87, correlation with unvalidated love questionnaire mean of 0.67]. The definition of unconditional love was given as "Unconditional love is the heartfelt benevolent desire that everyone and everything—ourselves, others, and all that exists in the universe—reaches their greatest possible fulfillment, whatever that may prove to be. This love is freely given, with no consideration of merit, with no strings attached, with no expectation of return, and it is a love that motivates supportive action in the one who loves." Following this definition, we asked participants to use a five-point scale (from "never" to "a great deal" [0 to 5 points]) with a sixth possibility of "not applicable" (worth 0 points) to respond to four questions: "To what extent do you feel unconditional love toward yourself?," "...toward other humans?," "...toward animals?," "...toward the device on which you are completing this survey?" The total score was the sum of the scores for all questions. In the present study, test-retest validity averaged 0.72.

(4) An overall wellbeing question ("How would you rate your overall physical, emotional, and spiritual wellbeing over the past 3 days?" with a five-point scale: "worst I've ever felt," "pretty bad," "fair," "really good," "best I've ever felt." Scores were 1 ("worst") to 5 ("best"). This is the first usage of this measure and it is not yet validated relative to other wellbeing measures. In the present study, test-retest validity averaged 0.51.

Calculated scores on these four surveys comprised our dependent variables; note that two of them (physical symptoms of stress scale and the overall wellbeing measure) are not validated with respect to other measures. Thus we refer to results related to these two measures as "measures" or "scores" rather than directly inferring that they represent actual reflections of physical symptoms of stress and overall wellbeing.

Qualitative Feedback Survey (Study Day 26)

This survey asked the following questions to elicit feedback on the study and the technology. "write about your experience of this pilot study over the past 26 days" (open text field), "let us know at least one thing you thought was good about how this study was conducted" (open text field), "let us know anything you thought we could have done better" (open text field), "in the future, would you be interested in using technology like the technology you used in this study?" (Yes/No), "if Yes, why?" (open text field), "if No, why not?" (open text field), "What would you do to change the technology so it would be easier to use, more interesting, more engaging, or more positive for you as a user?" (open text field), "What would you suggest we do to reach more people with an improved version of this technology?" (open text field).

Data Analysis

Quantitative Analyses

All quantitative analyses were performed using Libre Office Calc, R 4.1.0, Matlab R2018b, and the mediation bootstrapping program for R with 1000 simulations per model (Tingley et al., 2014). We had no hypothesis about the linearity (or lack thereof) of the changes in the dependent variables over time, so instead of using one-way repeated measures ANOVAs, we compared final (day 25) and initial (day 2) values for each of the dependent variables, at times creating a difference score (first-to-last value; day 25 minus day 2). We compared initial and final values with paired *t*-tests and compared differences between means of separate groups with independent *t*-tests. We did not perform Bonferroni correction of statistical tests on dependent variables used to test the hypotheses, as all of these comparisons were planned. Alpha was set at 0.05 for significance testing, and while all tests were performed on raw (not scaled) data, the scaling factor was linear and would not have changed the results of the statistical tests used. Scaling (dividing each score by the highest possible score) was only used in tables and graphs for ease of comparison between non-calculated dependent variables [i.e., scaling was used for all dependent variables except the deviation from balanced time perspective (dBTP) measure (Jankowski et al., 2020)].

Most analyses were straightforward, but the deviation from balanced time perspective (dBTP) measure was taken from a recent analysis indicating that the time perspective most closely associated with wellbeing is one described by this equation, dubbed by the authors the Deviation from Balanced Time Perspective-revised, though we generally refer to this measure as dBTP:

$$\text{dBTP-r\_noPH} = \sqrt{\left([1-PN]^2[5-PP]^2[1-PF]^2[5-F]^2\right)} \quad (1)$$

PN and PP indicate each participant's past negative and past positive scores (respectively), PF and F indicate each participant's present fatalistic and future scores (respectively). The numbers 1 and 5 indicate the most adaptive ("balanced") score for each

time perspective factor (example: it is most adaptive for overall wellbeing to think very few negative thoughts about the past [PN = 1] and many positive thoughts about the past [PP = 5]). Note that DBTP-r_noPH = 8 for a participant with the least adaptive time perspective (all values as the four factors are at the extreme end of the spectrum relative to the desired values), and will be zero for a participant with a "perfectly balanced" time perspective. We choose to remove present hedonic (PH) values as a factor, due to their non-linear and apparently inconsistent relationship with overall wellbeing (Jankowski et al., 2020). We indicate this in equation 1 by adding "_noPH" to the signifier at the left of the equation.

Qualitative Analyses

We used a thematic analysis approach. Coding and theme extraction was performed by two experienced researchers skilled in assessing qualitative data, but of course bias will be present in terms of which ideas, feedback, and experiences are reported as examples, and how codes and themes are selected. To mitigate the impact of this bias, where possible, any quantitative results obtained from the qualitative feedback survey are also provided in table form. Further, all raw data are available on request.

RESULTS

COVID Pivot

Our original plan was to facilitate 10 in-person focus groups across the United States and Canada throughout 2020, integrate feedback from those groups into iterative designs, and create a blueprint for developers to write software. To find our design partners, we reached out to 26 clinicians working with populations at the intersection of addiction, abuse, incarceration, poverty and trauma across the United States and Canada, including leaders in the Latino Social Workers Organization and the National Association of Black Social Workers. Our intention was to schedule in-person paid focus groups with their populations; 13 of these mental health professionals showed sustained interest.

However, soon travel and physical proximity restrictions imposed by COVID-19 resulted in a need to pivot our plans. We moved most of our participant recruitment online to an online work provider allowing pre-screening for desired demographics. We streamlined our approach and conducted a beta-test online focus group with unpaid beta testers and seven formal online focus groups. These focus groups introduced participants to the study and the motivations behind it. As a result of this change we were able to reach vulnerable populations with a potentially useful intervention and also provide extra income (up to $180 for full participation, see "Materials and Methods"). We refer to the participants who completed the 26-day study as *design partners*, because their feedback helped us iterate Time Machine's design.

Design Partner Demographics

By March 3, 2021, of 104 design partners enrolled, 97 design partners completed the study and were paid the full amount (93% completion rate). Of these, only 6 design partners took longer than 30 days to complete the study, with the longest time frame being 36 days. The remaining design partners did not ask for partial payment or communicate with us to say they dropped out, even after we contacted them to remind them they could receive partial payment. Our analyses included 96 of these design partners because values from one design partner did not register in the database due to a technical error. Demographics for the 96 included design partners are shown in **Table 1**. We did not reach our goal of at least 50% BIPOC design partners; in fact, 74% of our design partners were white. We did reach our goal of finding a group of design partners with life experiences related to LGBTQ+ identification (24%), disabilities (26%), incarceration (8.3%), military service (4.2%), and adverse childhood events (64%).

Unpaid (Optional) Engagements

During the 10 days following the required task days, 86 of our 96 design partners (90%) chose to engage with Time Machine during this unpaid optional period of the study. For those who chose to engage with the technology, the mean number of days of engagement was 5.8 days. Two early participants engaged in the recording task during the optional period for longer than 10 days (11 and 14 days) before we realized there was a bug in the software that did not let them know the optional period was over; we included their data in all analyses regardless of this deviation from the study plan.

Experimental Wellness Sliders

We examined responses to the experimental wellness sliders (**Figure 2**) registered within the app during the two 5-day required task periods and their relationship to other study variables. First, we found increases in measures of physical and spiritual wellness over time; significant self-reported increases occurred only during the first 5-day period (**Figures 3A,B**; 1st 5 days: physical: $t_{95} = 2.07$, $p < 0.045$, $d = 0.21$; emotional: $t_{95} = 1.60$, $p < 0.113$, $d = 0.16$; spiritual: $t_{95} = 3.38$, $p < 0.002$, $d = 0.35$; 2nd 5 days: all p-values > 0.30). As these were not our planned analyses, we performed Bonferroni correction on these results, after which only the data from the spiritual wellness slider can be considered significant (cutoff = $p < 0.008$). Thus it appears that measures of whatever design partners defined as spiritual health increased over the course of the first 5 required task days. Note that the mean test-retest reliability of the spiritual wellbeing slider was moderate-to-good: 0.48 over the first five days, and 0.41 over the second five days.

Because we were using these sliders to solicit responses for the first time, we were curious whether the data reported using these sliders would correlate with data from the dependent variables assessed with the recurring assessments, as a way of validating the sliders. To perform these correlations, we first considered which day or days would be appropriate to compare – especially given that questions on the recurring assessments asked design partners to consider the most recent 3 days (including the survey day) in their responses, while the sliders asked only about the current day. Because of this consideration, we determined that the average scores on the last 2 days of slider responses would be

TABLE 1 | Demographics for the 96 design partners in the study.

Self-reported race/ethnicity	Total	Women	LGBTQ+	Disabilities	Incarceration	Served in United States military	ACES score 2+
Asian	3	1	1	0	0	0	3
Native American/ White	2	2	0	1	0	0	2
Black	9	4	2	0	0	0	5
Black/LatinX	3	0	0	1	0	0	1
LatinX	4	3	1	2	0	1	2
Mixed	2	0	0	1	1	0	2
South Asian	2	0	0	1	0	0	2
White	71	50	19	19	7	3	44
Total	96	*60*	*23*	*25*	*8*	*4*	*61*

Note that the questions on the demographic survey that asked about race/ethnicity and gender provided an open text field for responses, so individuals could self-identify. Zero individuals self-described as non-binary or transgender, but it is possible that some of those who self-identified as women or men are also other genders.

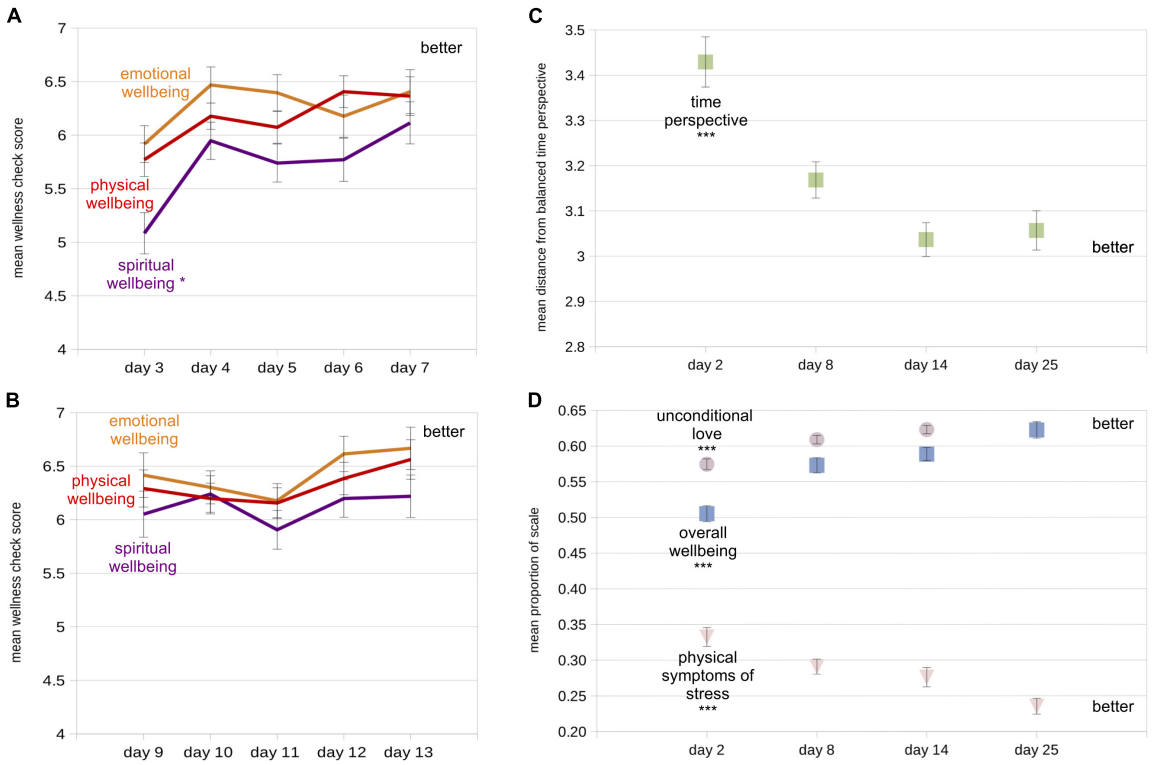

FIGURE 3 | Mean values of wellbeing measures at all measurement times (N = 96). "Better" label indicates the area of the plots indicating improvement (higher or lower values, depending on measure). **(A)** Mean responses from experimental within-app wellness checks (1 = worst, 10 = best) for the first five task days. **(B)** Same as **(A)**, but for the second five task days. **(C)** Mean distance from balanced time perspective (dBTP) on each of the four recurring assessments. **(D)** Mean proportion of the total scale used for the unconditional love (violet circles), overall wellbeing (blue squares), and physical symptoms of stress (pink triangle) measures. Lighter colors are used so small error bars inside the symbols can be seen. Also note that the day 25 value for unconditional love is the same as the overall wellbeing value (also see **Table 2**), so one symbol occludes the other. Error bars in each figure represent +/- 1 standard error of the mean (S.E.M), calculated *within* participants. For first-vs.-last measure comparison statistics (paired t-tests), $^{*}p < 0.05$; $^{***}p < 0.0001$.

most appropriate to compare to the responses on the recurring assessments. Thus we used Pearson correlations to compare the average of each slider's responses for the 2 days prior to recurring assessment 2 (given on study day 8) and recurring assessment 3 (given on study day 14) with the four dependent variables calculated from recurring assessment responses on study days 8 and 14.

Overall, many of these correlations were significant, and a clear pattern emerged indicating that design partners were, for the most part, giving the three sliders equivalent meanings (**Table 2**). Averages of the two slider responses prior to the recurring assessments were significantly negatively correlated with dBTP and physical symptoms of stress scores on the recurring assessments. Correlations between slider responses

and overall wellbeing were strong and positive, with a slight shift toward a higher correlation with emotional wellbeing for data from the third repeated assessment. Interestingly, the odd dependent variable out was the unconditional love variable – there were no significant correlations between average responses on any of the three sliders and repeated assessment measures of unconditional love. The lack of correlations between reported feelings of unconditional love and responses on the three sliders suggests that design partners did not feel that the unconditional love measure had any consistent relationship to physical, emotional, or spiritual wellness; thus the feelings of unconditional love questions on the repeated assessments seem to address a unique variable. Further, it appears that responses on the three sliders were for the most part consistently tied to time perspective, physical symptoms of stress, and overall wellbeing. These results also indicate that design partners were relatively intentional in their responses both within (sliders) and outside of (recurring assessments) the Time Machine technology.

Pre-planned Hypothesis Tests on Dependent Variables

All four dependent variables evidenced significant improvement from the initial (day 2) to final (day 25) values (**Table 3A** and **Figures 3C,D**), supporting Hypothesis 1 (Methods). The most impressive results were a 12% improvement in the measure of overall wellbeing from the first to last assessment, and a near 10% drop in the measure of physical symptoms of stress during the same time period. For all four dependent variables, the most quantitative improvement in mean values occurred between the first and second assessments, although for the physical symptoms of stress measure, the improvements at the beginning and end of the study were roughly equivalent (improvement of 0.385 from the first to second assessment, and 0.376 from the third to last assessment), hinting at a potentially different mechanism underlying changes in scores on this measure.

Examining the same data split according to task order (group) provides evidence that the order of the tasks had some influence on each of the four dependent variables, generally favoring the recording-first group in partial support of Hypothesis 2 (**Figures 4A–D** and **Table 3B**). Note that we did not combine data across groups for each of the required tasks because of the clear indication, discussed above, that the first 5 days showed the most improvement in most measures regardless of the nature of the task. The improvements in time perspective from the first to last assessment were significantly larger in the recording-first versus the quote-first group (day 25 minus day 2: $t_{94} = 2.46$, $p < 0.016$, $d = 0.51$), as predicted. Overall, the recording-first group significantly improved on the dBTP first-to-last measure from the first to the last assessment, while the quote-first group did not (day 2 to day 25: recording-first group $t_{51} = 4.78$, $p < 0.0001$, $d = 0.66$; quote-first group $p > 0.231$; **Figure 4A**). Meanwhile, the physical symptoms of stress measure was quantitatively lower for the recording-first group throughout the study. Because on day 2 participants were told which group they were to be placed in prior to taking the survey, it is possible that this influenced some participants in the quote-first group to be particularly aware of their physical symptoms of stress in response to not being able to perform the time-travel process first. While there was no significant difference in improvement on the physical symptoms of stress measure between the groups ($p > 0.75$), both groups improved significantly, showing reductions in physical symptoms of stress from first-to-last assessment (recording-first group $t_{51} = 3.15$, $p < 0.003$, $d = 0.44$; quote-first group $t_{43} = 3.63$, $p < 0.0008$, $d = 0.55$; **Figure 4B**). Improvements in feelings of unconditional love from pre-to-post assessment were not significantly different between the groups either ($p > 0.15$). Nevertheless, the recording-first group showed quantitatively greater improvement while improvement in the quote-first group was only borderline significant (recording-first improvement = 1.29, $t_{51} = 3.67$, $p < 0.0006$, $d = 0.49$; quote-first improvement = 0.59, $t_{43} = 1.96$, $p < 0.057$, $d = 0.29$; **Figure 4C**). Finally, the overall wellbeing measure was also not significantly different between groups ($p > 0.31$). Both groups improved significantly on the overall wellbeing measure between the first and last assessments (recording-first group $t_{51} = 5.34$, $p < 0.0001$, $d = 0.71$; quote-first group $t_{43} = 3.40$, $p < 0.002$, $d = 0.51$; **Figure 4D**). Critically, participants were not assigned by the experimenters to a particular task order, but were instead randomly assigned by the software and there were no significant differences between the groups on any dependent variable on the initial assessment or ACES scores (all ps > 0.070). Overall, these results suggest that recording-first participants had a slight advantage in that their improvements were more impressive than the improvements of quote-first participants. Particularly for dBTP and feelings of unconditional love significant improvements from the first to last assessments were absent or borderline for the quote-first group, while they were robust for the recording-first group. However, these results can only be seen as partial support for Hypothesis 2, which asserted that *all* dependent variables would show more improvement amongst participants in the recording-first group.

Because all of our data were based on some type of self-report, we were especially interested in whether the number of reported adverse childhood experiences on the ACES survey

TABLE 2 | *R* values for Pearson correlations between slider responses (average of the 2 days of responses prior to repeated assessments) vs. dependent variables on repeated assessments 2 and 3.

Measure	vs. physical	vs. emotional	vs. spiritual
dBTP			
day 8/RA2	**−0.255**	**−0.301**	**−0.210**
day 14/RA3	**−0.308**	**−0.371**	**−0.337**
PSS			
day 8/RA2	**−0.392**	**−0.351**	**−0.327**
day 14/RA3	**−0.351**	**−0.233**	**−0.260**
UL			
day 8/RA2	0.139	0.129	0.157
day 14/RA3	0.110	0.176	0.135
Overall			
day 8/RA2	**0.617**	**0.596**	**0.561**
day 14/RA3	**0.517**	**0.575**	**0.534**

RA, repeated assessment; dBTP, distance from balanced time perspective; PSS, physical symptoms of stress; UL, feelings of unconditional love; overall, overall wellbeing. Bolded values are significant.

TABLE 3 | Mean (SD) values for each of the raw dependent variables on all four assessments as well as statistics for paired *t*-tests comparing values on first and last assessments within participants.

Measure	Day 2 RA 1	Day 8 RA 2	Day 14 RA 3	Day 25 RA 4	First-to-last change RA 4 – RA 1	*t*	*p*
(A) Data from 96 participants taken together.							
dBTP	3.43 (1.04)	3.17 (1.02)	3.04 (0.99)	3.06 (1.10)	−0.37 (0.85) prop: −0.05 (0.11)	$t_{95} = 4.29$	**<0.0001**
PSS	0.33 (0.26)	0.29 (0.24)	0.28 (0.24)	0.24 (0.24)	−0.10 (0.20)	$t_{95} = 4.77$	**<0.0001**
UL	0.57 (0.14)	0.61 (0.15)	0.62 (0.16)	0.62 (0.16)	0.05 (0.12)	$t_{95} = 4.01$	**<0.0002**
Overall	0.51 (0.18)	0.57 (0.17)	0.59 (0.15)	0.62 (0.17)	0.12 (0.18)	$t_{95} = 6.21$	**<0.0001**
(B) Data split according to group (task order).							
dBTP							
Recording first	3.48 (1.01)	3.10 (1.12)	2.89 (1.04)	2.91 (1.13)	−0.56 (0.85) prop: −0.07 (0.11)	$t_{51} = 4.78$	**<0.0001**
Quote first	3.37 (1.08)	3.25 (0.89)	3.21 (0.90)	3.22 (1.04)	−0.15 (0.80) prop: −0.02 (0.10)	*N.S.*	>0.230
PSS							
Recording first	0.29 (0.24)	0.24 (0.22)	0.23 (0.20)	0.20 (0.20)	−0.09 (0.21)	$t_{51} = 3.15$	**<0.003**
Quote first	0.38 (0.27)	0.35 (0.25)	0.33 (0.28)	0.28 (0.27)	−0.10 (0.19)	$t_{43} = 3.63$	**<0.0008**
UL							
Recording first	0.57 (0.11)	0.62 (0.14)	0.63 (0.15)	0.63 (0.16)	0.06 (0.13)	$t_{51} = 3.55$	**<0.0009**
Quote first	0.58 (0.17)	0.60 (0.16)	0.61 (0.17)	0.61 (0.16)	0.03 (0.10)	$t_{43} = 1.96$	<0.058
Overall							
Recording first	0.52 (0.17)	0.61 (0.15)	0.60 (0.15)	0.65 (0.17)	0.13 (0.18)	$t_{51} = 5.34$	**<0.0001**
Quote first	0.49 (0.19)	0.53 (0.19)	0.57 (0.15)	0.59 (0.18)	0.10 (0.19)	$t_{43} = 3.40$	**<0.002**
(C) Data split according to median split on adverse childhood experiences survey (ACES scores).							
dBTP							
ACES < 3	3.18 (1.05)	2.95 (1.08)	2.86 (0.99)	2.79 (1.17)	−0.39 (0.93) prop: −0.05 (0.12)	$t_{51} = 3.05$	**<0.004**
ACES ≥ 3	3.71 (0.96)	3.42 (0.89)	3.24 (0.96)	3.36 (0.93)	−0.35 (0.76) prop: −0.03 (0.10)	$t_{43} = 3.04$	**<0.004**
PSS							
ACES < 3	0.33 (0.24)	0.28 (0.24)	0.25 (0.26)	0.22 (0.23)	−0.11 (0.20)	$t_{51} = 4.14$	**<0.0002**
ACES ≥ 3	0.33 (0.28)	0.30 (0.25)	0.30 (0.22)	0.25 (0.26)	−0.08 (0.20)	$t_{43} = 2.60$	**<0.02**
UL							
ACES < 3	0.58 (0.12)	0.62 (0.13)	0.62 (0.14)	0.64 (0.15)	0.05 (0.12)	$t_{51} = 3.13$	**<0.004**
ACES ≥ 3	0.57 (0.16)	0.60 (0.16)	0.62 (0.17)	0.61 (0.17)	0.04 (0.11)	$t_{43} = 2.50$	**<0.02**
Overall							
ACES < 3	0.54 (0.16)	0.58 (0.18)	0.61 (0.14)	0.62 (0.19)	0.08 (0.19)	$t_{51} = 2.97$	**<0.005**
ACES ≥ 3	0.46 (0.18)	0.57 (0.17)	0.57 (0.15)	0.62 (0.16)	0.16 (0.17)	$t_{43} = 6.20$	**<0.0001**

RA, repeated assessment; first-to-last change = mean difference of RA4 minus RA1 values; dBTP, distance from balanced time perspective; prop., proportion of total scale as comparison measure for dBTP, all other values given in proportion of total scale; PSS, physical symptoms of stress; UL, feelings of unconditional love; overall, overall wellbeing. Bold p-values indicate significance.

would be reflected in the dependent variables, at least on the first assessment day, as predicted by Hypothesis 3. Because of the strong literature in this area (see Introduction), if there were no differences in dependent variables related to ACES scores, we would suspect either that participants were not being careful and honestly reporting their experiences on the ACES survey, the repeated assessments, or both. While a median split (low ACES < 3; high ACES ≥ 3) indicated that on all four measures low and high ACES design partners showed significant improvements from the first to the last recurring assessment on all four measures (**Table 3C**), there were clear ACES-related differences for both the dBTP and overall wellbeing measures. On the dBTP measure, design partners reporting higher ACES (dark symbols in **Figure 5A**) had less balanced time perspectives (less adaptive) compared to design partners reporting lower ACES (lighter symbols) on all 4 days (day 2: $t_{94} = 2.53$, $p < 0.015$, $d = 0.52$; day 8: $t_{94} = 2.33$, $p < 0.025$, $d = 0.48$; day 14: $t_{94} = 1.92$, $p < 0.060$, $d = 0.39$; day 25: $t_{94} = 2.59$, $p < 0.015$, $d = 0.53$); the day 2 results support Hypothesis 3. In contrast, neither the scores on the physical symptoms of stress measure nor the unconditional love measure revealed differences between higher and lower ACES individuals, though the general tendency was for lower-ACES individuals to give more psychologically positive responses on both measures than higher ACES individuals (**Figures 5B,C**). Overall wellbeing scores were significantly higher on the first recurring assessment day for those with relatively lower ACES scores as compared to those with higher ACES scores (**Figure 5D**; day 2: $t_{94} = 2.34$, $p < 0.025$, $d = 0.48$),

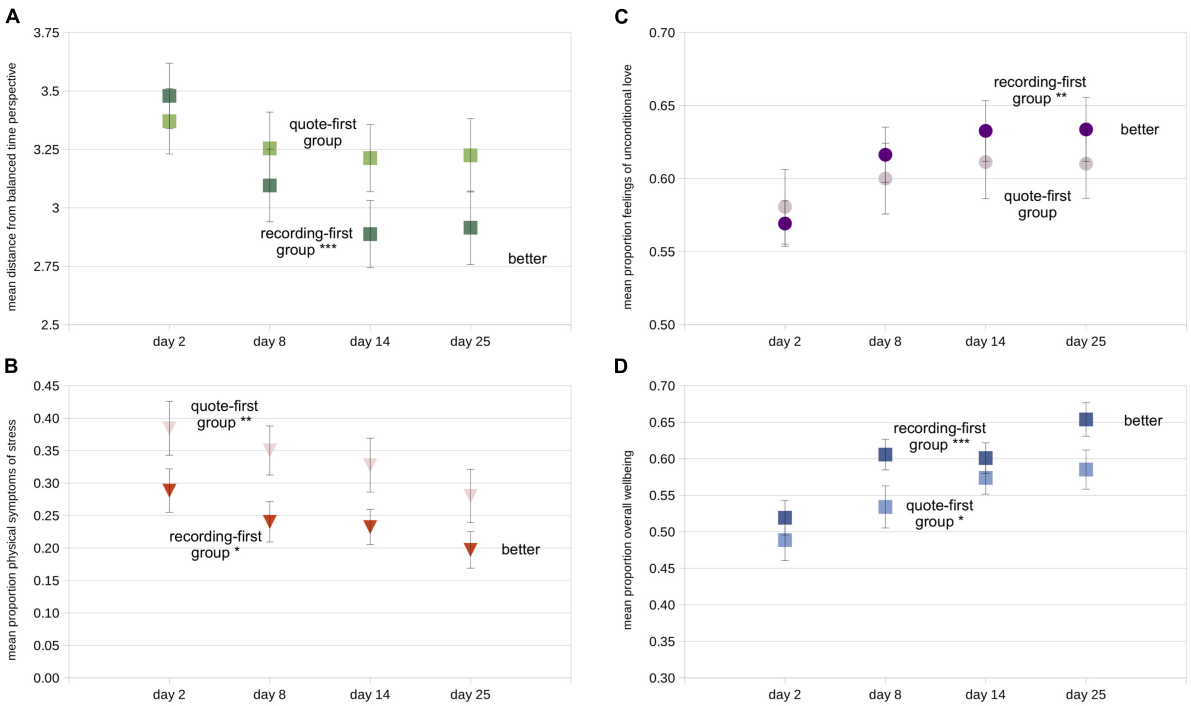

FIGURE 4 | Mean values of all four dependent variables split according to task order (darker symbols = recording-first group; lighter symbols = quote-first group). **(A)** Mean distance from balanced time perspective (dBTP) on each of the four recurring assessments. **(B)** Mean proportion of the total scale used for the physical symptoms of stress measure, **(C)** the unconditional love measure, and **(D)** the overall wellbeing measure. Error bars in each figure represent +/- 1 S.E.M, calculated across participants. For first-vs.-last measure comparison statistics (paired *t*-tests), $^{*}p < 0.05$; $^{**}p < 0.01$; $^{***}p < 0.0001$.

in support of Hypothesis 3. In our most striking quantitative result, this difference disappeared during the study period, with both groups sharing very similar mean scores on the overall wellbeing measure on the day of the final recurring assessment, such that design partners with lower ACES improved significantly less (half as much on average) on their overall wellbeing scores than design partners with higher ACES ($t_{94} = 2.23$, $p < 0.028$, $d = 0.46$). While both groups showed significant improvement on the overall wellbeing measure (higher ACES: $t_{44} = 6.36$, $p < 0.001$, $d = 0.95$; lower ACES: $t_{50} = 2.94$, $p < 0.005$, $d = 0.41$), those with higher ACES reported a 16% improvement on the overall wellbeing measure over the course of the study, the largest change we recorded. There were no significant differences in improvement for any other dependent variable. Thus the results from the time perspective and overall wellbeing measures support Hypothesis 3, while the results from the overall wellbeing measure provide strong evidence against Hypothesis 4 – which was that individuals with lower ACES scores would report *greater* improvement on all four dependent variables. In addition to addressing our hypotheses, the varying patterns of these results support two additional ideas: (1) our design partners were for the most part accurately recording their experiences, and (2) something about the study improved all four dependent variables for individuals with both lower and higher ACES scores, with striking improvement on the overall wellbeing measure for those with lower ACES scores.

To investigate Hypothesis 5, which predicted that greater use of the technology during the study period would positively relate to greater improvement in all dependent variables, we examined the relationships between three independent variables and changes in our dependent variables. To this end, we performed linear regressions on differences calculated between the first and last repeated assessment day for each dependent variable as predicted by all three independent variables (ACES score, group, number of optional logins). These four multiple linear regressions yielded significant results for the dBTP and overall wellbeing measures only (**Table 4**). In the reduced models, improvement in dBTP (i.e., a reduction in value) was positively predicted by inclusion in the recording-first group and a greater number of optional logins, while the improvement in overall wellbeing was positively predicted by those same independent variables as well as a higher ACES score. The number of optional logins was included in both reduced models, providing additional evidence that the recording and wellness check tasks available in the optional period of the study influenced both time perspective and wellbeing scores positively. Thus these results partially support Hypothesis 5, at least for improvements in time perspective and the overall wellbeing measure.

Post-hoc Analyses of Dependent Variables

The pre-planned tests of our five hypotheses revealed a pattern of results that warranted further examination. Because improvements in time perspective and scores on the overall

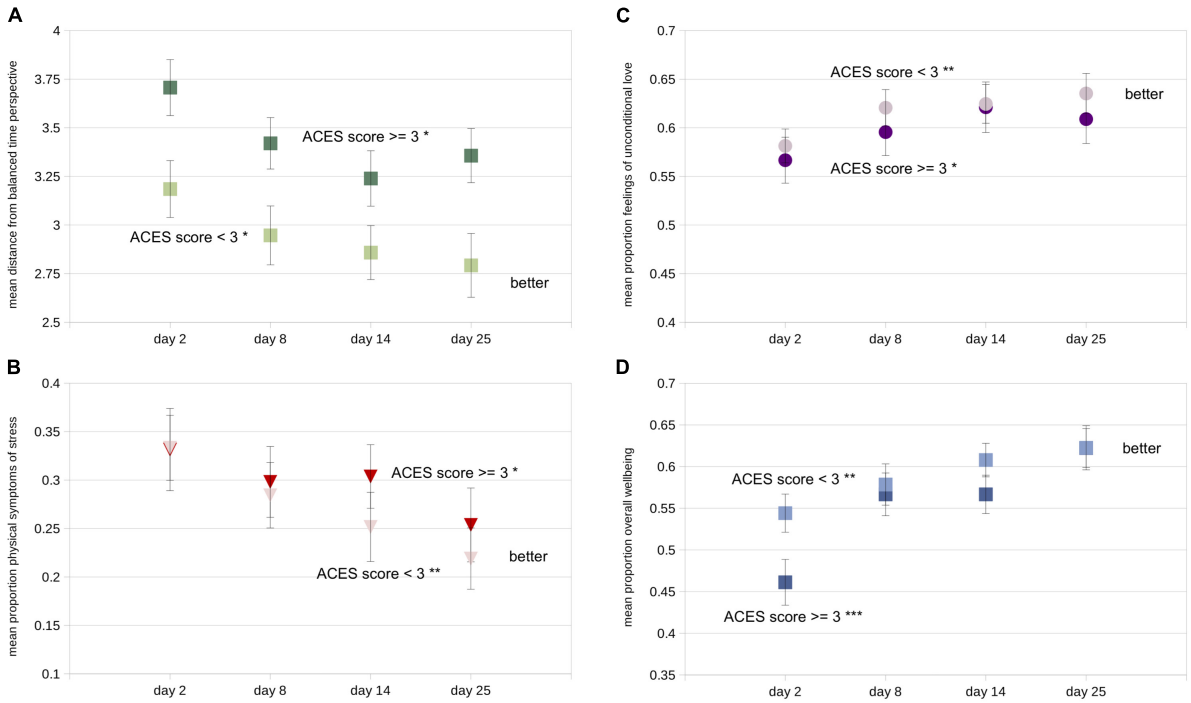

FIGURE 5 | Mean values of all four dependent variables split according to median split on ACES inventory score (darker symbols = ACES score ≥ 3; lighter symbols = ACES score < 3). **(A)** Mean distance from balanced time perspective (dBTP) on each of the four recurring assessments. **(B)** Mean proportion of the total scale used for the physical symptoms of stress measure, **(C)** the unconditional love measure, and **(D)** the overall wellbeing measure. Error bars in each figure represent +/- 1 S.E.M. calculated across participants. For first-vs.-last measure comparison statistics (paired *t*-tests), $*p < 0.05$; $**p < 0.01$; $***p < 0.0001$.

wellbeing measure were the only dependent variables that were related to the use of the technology during the non-required period, we first focused on determining whether changes in the other dependent variables occurring during the required portion of the study would predict first-to-last changes in dBTP and the overall wellbeing measure. Thus we used as predictors the difference between scores on days 14 and 2 (i.e., day 14 minus day 2) for the physical symptoms of stress and unconditional love measures. Full models for each were significant (dBTP: adj. $R^2 = 0.051$, $p < 0.04$; overall wellbeing: adj. $R^2 = 0.058$, $p < 0.03$). Reduced models only included a single factor – changes in feelings of unconditional love. In both cases increases in unconditional love were predictive of improvement in both dBTP (i.e., reduction in dBTP; adj. $R^2 = 0.060$, $p < 0.01$) and the overall wellbeing measure (i.e., increase in overall wellbeing scores; adj. $R^2 = 0.063$, $p < 0.008$). If the relationships between changes in feelings of unconditional love and both dependent variables were moderated by the number of optional logins between the third and fourth repeated assessments, this would be a further indication that the tasks performed during the optional logins (recording/listening to messages and performing wellness checks) were related to improvements in time perspective and overall wellbeing scores. In fact, moderation analyses indicated that increases in overall wellbeing scores were significantly positively moderated by the number of optional logins, while decreases in dBTP values were not moderated by the same (model included unconditional love score day 3 minus day 1 [UL3-1], optional logins, and their interaction: adj. $R^2 = 0.098$, $p < 0.004$ for overall wellbeing change; adj. $R^2 = 0.075$, $p < 0.01$ for dBPT change; moderation by number of optional logins: $p < 0.04$ for overall wellbeing change; $p > 0.10$ for dBPT change). These results suggest that changes in unconditional love in the required portion of the study predict study-long changes in both dBTP and overall wellbeing scores, and for overall wellbeing this relationship was stronger for individuals who logged in more often during the optional period. While this result lends validity to both the overall wellbeing measure as well as the value of the recording task performed during the optional period, it is worth noting that there is no implied causality with any moderation effect.

To examine potentially causal relationships between the three apparently related dependent variables – feelings of unconditional love, dBTP and overall wellbeing scores – we performed four mediation analyses. For each, overall wellbeing on the fourth assessment (day 25) was the dependent variable, the unconditional love score on the third repeated assessment (day 14) was the mediator, and the treatment was either the physical symptom of stress (PSS) score or the dBTP score calculated from the third or second repeated assessments (both the dBTP and PSS factors from a given assessment time were included in the model, but only one was the treatment in each of the mediation analyses). Scores on given days were selected instead of change scores because for mediation analysis to suggest a causal relationship, the treatment and the mediator should be measured prior to

TABLE 4 | Results from multiple linear regressions predicting changes (RA4 value minus RA1 value) in the four dependent variables.

	dBTP change	PSS change	UL change	overall change
Full model	**adj. R^2 = 0.084 p < 0.012**	adj. R^2 = −0.021 p > 0.800	adj. R^2 = 0.01 p > 0.274	**adj. R^2 = 0.108 p < 0.004**
ACES score				0.106
Group	−0.464			0.251
Optional logins	−0.050			0.051
Reduced model	**adj. R^2 = 0.085 p < 0.006**			**same as full model**

Predictors are independent variables (across top). RA, repeated assessment; dBTP, distance from balanced time perspective; PSS, physical symptoms of stress; UL, feelings of unconditional love; overall, overall wellbeing. Bold adjusted R^2 values indicate significance. Estimates for each participating factor in the reduced model are shown, bolded estimates indicate independent significance for the given factor. Rows marked "reduced model" give results for the reduced model as a whole, where the full model was significant. Shaded cells indicate the factor was not included in the reduced model because the adjusted R^2 improved when the given factor was removed, or that a reduced model was not created due to insignificance of the full model. Note that group was coded as 0 (for quote-first group) and 1 (for recording-first group), so a positive estimate indicates that higher values of the dependent variable were correlated with the recording-first group. Also note that for dBTP and PSS, negative changes between RA1 and RA4 indicated improvement, while the reverse is true for UL and overall change measures.

the outcome variable, and change scores required measurement on the first assessment day (day 2). Unconditional love was selected as the mediating variable because it showed a clear relationship with overall wellbeing scores (see above), and prior research indicated that self-transcendent emotions can mediate wellbeing (Vieten et al., 2014). Starting with scores on the third assessment (following the required portion of the study), there was no mediation by the unconditional love measure for the model with physical symptoms of stress measure as the treatment (average causal mediation effect [ACME] $p > 0.929$ for PSS on third assessment), but for the model with the dBTP measure as the treatment, there was significant partial mediation by the unconditional love measure (ACME 95% CI −0.055, −0.120; $p < 0.005$, est. prop. mediated 0.182). Note that the negative value for the ACME arose because lower values of dBTP (more balanced time perspective) on the third assessment (day 14) positively predicted both greater feelings of unconditional love on the third assessment as well as greater overall wellbeing scores on the final assessment (day 25), while the unconditional love measure positively predicted scores on the wellbeing measure (**Figure 6A**). Further, the same was true for dBTP on the second recurring assessment (**Figure 6B**; ACME 95% CI −0.054, −0.120; $p < 0.017$, est. prop. mediated 0.207), but note that this result does not pass Bonferroni correction (Bonferroni cutoff = $p < 0.0125$). When physical symptoms of stress on the second assessment was the treatment, no mediation was present (ACME $p > 0.963$).

Finally, to determine whether the unconditional love mediation effect was driven by changes related to the study rather than any pre-existing relationship between time perspective and overall wellbeing, we examined this same mediation using as the treatment factor the dBTP measure on the first recurring assessment. We found the mediation was not present (ACME $p > 0.311$), even though dBTP on the first assessment strongly predicted the final overall wellbeing score (adj. $R^2 = 0.078$, $p < 0.004$). Thus these results support the idea that the mediation effect was driven by changes in the relationship between dBTP, unconditional love, and overall wellbeing scores that occurred during the time of the study. Overall, these mediation analyses results point to a causal relationship in which unconditional love feelings apparently influenced the relationship between time perspective and overall wellbeing scores.

Qualitative Findings

Inclusive Design Process

In our unique study design, we held the study and technology features described above (Methods) constant while we incorporated aesthetic enhancements requested by our design partners. We based these enhancements on early feedback from attendees at an unpaid focus group as well as feedback from paid focus group participants who met within the first month of the study (September 2020). As a result of this early feedback, we altered the software to include: a recording playback button (due to background noise and privacy issues, many design partners were whispering and wanted to make sure their recordings were audible; added after 34 participants had started), the ability to cancel recordings (in case they wanted to re-think their message; added after 34 participants had started), a countdown timer for recordings (so they could time their recording to the 1-min limit; added after 34 participants had started), better daily notifications (some were not being received; added after 46 participants had started), a study-day tracker to remind people where they were in the study (so they knew when each study stage would start/end; added after 46 participants had started), and a table showing previous "wellness check" responses (because design partners wanted to track their changes in wellness over time; added after 46 participants had started). While none of these enhancements impacted whether design partners could perform the study tasks, we do think they enhanced the technology and also reminded our design partners of their role as key team members in improving the technology. The impact of this engagement is not to be underestimated as a potential factor in the overall results (see section "Discussion").

This level of engagement seemed to be contagious. For example, one Turker, known for organizing other Turkers, went out of their way to recruit others for this study because they were so impressed by their own experience in it. Further, three sets of Turkers requested unscheduled and impromptu focus groups following the close of their paid participation. When they were told they would not be paid for these groups and we could not report their feedback from these groups in any scholarly paper, the Turkers still wished to connect via Zoom. Some of them chose to show their faces and share their voices. They offered helpful feedback that we are using to shape the next stage of the technology. However, the most exciting outcome of those impromptu focus groups is that the design partners who organized them asked if they could continue to use the technology

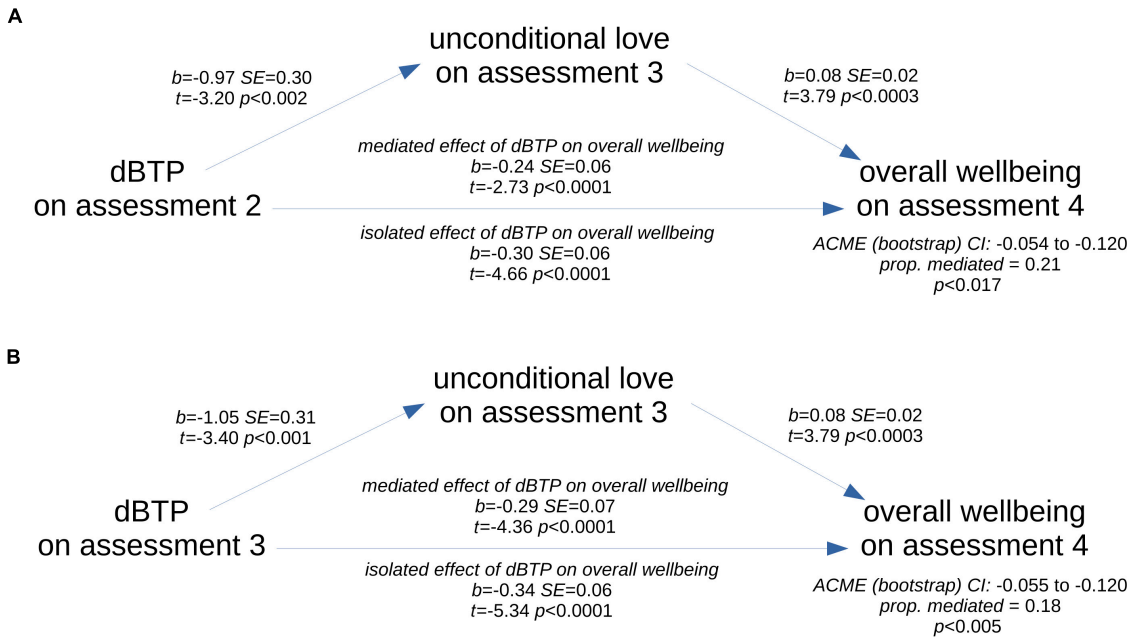

FIGURE 6 | Schematics of the two significant mediation relationships. Scores on the unconditional love measure on the third assessment partially mediated the relationship between scores on the dBTP measure on the second **(A)** and third **(B)** assessments and overall wellbeing scores as measured on the last assessment.

after the study was complete. We realized we could offer this to all design partners, and added an option at the end of the study; eight design partners continued using the technology following the end of the study.

Feedback Survey Results

The final survey comprised eight questions with open-ended text-field responses and one yes/no question. As one measure of engagement with the study, we calculated the average time taken to complete the final survey. After removing two obvious outliers for whom it was clear browsers were left open as they took the survey, the average time taken was 16.92 min. Since the survey could be completed with concise answers in less than 4 min and payment did not depend on survey answers, this indicated to us that on average, our design partners were invested in communicating their actual experiences. Further, their responses to key questions indicated this investment as well. For instance, the yes/no question, "In the future, would you be interested in using an improved version of the technology you used in this study?" was answered in the negative by only 4 of the 96 design partners. Reasons for these negative responses were given by all four, in response to the follow-up question, "briefly describe why you wouldn't be interested in using technology like this in the future."

- "Because I really rather focus on God than myself. I do feel that being in touch with all parts of myself is helpful, but it's not really something to focus on for too long. God lives outside of time and I can connect to Him the same, whether it's my past, present of future self. Also, I don't like talking out loud or listening to myself because I'm rarely alone in the house."
- "Because I don't feel that it helped me in any significant way."
- "Because I don't want to check in with my wellbeing by looking at a phone or computer screen."
- "Because I don't think it's powerful enough to deal with the issues I have in my life."

Representative responses from the remaining 92 design partners when asked, "briefly describe why you would be interested in using technology like this in the future," include the following:

- "I just think it was super helpful and if it can help someone else, even better."
- "Because I often overlook my own mental health, and need to create better habits to support my general wellness. I am used to putting my needs last, and focusing on the needs of others first."
- "I'd like to see how we shaped it together after all the feedback we've shared, plus I really enjoy using it."
- "Because I want to see if you took my suggestions :-)"
- "Because I got used to looking forward to take one minute a day to actually think seriously about how I'm feeling."
- "Some days I really do need to remind myself of things I've already been through, or how things will be better in the future. It's hard to see through the trees sometimes without a little push."

To perform the thematic analysis without concern for how each question might bias responses, we coded each statement

given in response to any of the questions according to two codes: positive and negative. Because the qualitative feedback survey asked an equal number of questions requiring positive and negative responses, the survey itself should not have biased our design partners to produce more positive or negative responses. Once coding was done, we extracted three overarching themes in the comments: the technology, the study design, and overall response to the study. **Table 5** reports the total number of statements within each theme, as well as within sub-themes.

Within the technology theme, statements coded as negative included, "The system seemed to miscount the day I was on," and, "Everything went great, but toward the end, Days 15–24, the Day got stuck at 15 and never went past that, which made it confusing to keep track of what day I was on in the study." These statements referred to a new feature to report on screen the day participants were on in terms of study progress; the actual database correctly counted the participants' study days. Positive technology statements included, "I'm a UX designer, and I actually found the technology to be very straight forward and easy to use (but I also recognize that I'm technically savvy. . .)" and, "it was well spaced out in the fact that you could do it at your pace instead of being rushed to finish it like many other things like this are."

TABLE 5 | Results of qualitative analysis of the statements on the feedback survey.

	Negative experiences	*N*	Positive experiences	*N*
Technology				
	didn't like the visuals	7	appreciated reminders/notifications	3
	wanted more freedom in recording time, availability of app	12	liked flexibility in timing	4
	needed prompts/more guidance for recording	17	liked brief recording time limits	4
	wished for better reminders/notifications	25	felt technology was interesting/unique	20
	had periodic tech issues (operating system, sound, other)	28	tech seemed easy/quick to use	38
	Total technology – negative	**89**	**Total technology – positive**	**69**
Study design				
	wanted more meditations	3	enjoyed guided meditation in focus group	10
	felt the need for greater control over which task was performed	5	seemed like study taught ideas/tools to use going forward	10
	wanted greater variety within wellness checks	6	felt positive about study team	31
	would have appreciated more group interactions	11		
	was hoping for more guidance in the study overall	17		
	wanted a greater variety of tasks	19		
	Total study design – negative	**61**	**Total study design – positive**	**51**
Response to study itself				
	didn't like talking/listening to self	7	felt calmer	3
	felt the process was not helpful for self/not needed for self	13	increased connection to others	3
			felt similar to journaling	4
			liked visuals/graphics	5
			felt generally positive	5
			gave perspective	7
			grew from not enjoying to enjoying talking to self	7
			originally skeptical of process but changed mind	7
			felt kinder to self	9
			liked listening to self	9
			felt like this process is a good/important idea	11
			liked listening to quotes	11
			looked forward to future	12
			helped mood/mental health	13
			connected with/learned about self	14
			increased loving feelings toward self	18
			generally enjoyed process	34
			seemed generally helpful	35
			felt like a positive daily routine	39
	Total response – negative	**20**	**Total response – positive**	**246**

To read examples of each of the two codes (positive and negative) within each theme (technology, study design, and response to the study), see "Results."

Within the study design theme, statements coded as negative included, "I think the recordings will be better and maybe easier if you have something think about and spell out which scenario they're planning to record, and write it down," and, "The guided meditation was very impactful to me and I think having a bit more direction could have helped - not necessarily something as intensive as the guided meditation, but maybe some prompts for the recordings or reminders of how to approach our past/future selves." Positively coded study design comments included, "I really liked how responsive and available the team was to hear our issues along the way, and sometimes just to check in and see how we were doing with the project," and "Inspiring onboarding session with leaders of the study."

Finally, within the response to the study theme, statements coded as negative included, "I didn't feel overly compelled to continue using it after the 15 days or so, but I could see how others might benefit from its continued use," and, "I've never been much of a believer in this sort of thing. Sadly, I must report that this experience has not changed that." Positive study response statements were: "My experience with this study was nothing but positive, starting from the focus group on. The requesters of the study were very responsive, kind and helpful. I have learned a life-long, life-changing skill because of this study and I am very grateful and blessed to have been part of it," and, "Oh my goodness. I have struggled for so many years with a lot of mistakes and a lot of bad choices. I haven't been able to think about myself without a bit of hatred for who i used to be. Y'know what? I don't have those feelings right now. I understand myself now I think. I am able to feel peace now and empathy, which is something I struggle with. Am I where I want to be yet with how I feel about myself? No. But am I on the right track? Yep. I am looking forward to meeting my future self one day I think she is ready for us now too."

We believe the overwhelmingly positive responses to the study itself are related both to the features of the technology and the relationships we developed with our design partners over the course of the study. Future versions of Time Machine to be released publicly will take into account many of the suggestions we received on the feedback survey (see Discussion).

DISCUSSION

Conclusions and Limitations

The 96 paid design partners who completed this 26-day pilot study were largely positive about the technology and the study, as evidenced by 90% participation in the unpaid optional period of the study, the detailed and mostly positive feedback received on the final survey, and the fact that 96% of our design partners said that they would like to use an improved version of this technology again.

Our hypotheses were confirmed (Hypothesis 1), partially supported (Hypotheses 2, 3, and 5) or directly opposed (Hypothesis 4) by the evidence. On average, design partners reported significant improvement from day 2 to day 25 on all four dependent variables, confirming Hypothesis 1. Their deviations from a balanced time perspective (dBTP) became smaller by an average of 5%, indicating that through the course of the study their time perspectives became more aligned with the time perspective balance that best predicts overall wellbeing. Their physical symptoms of stress scores reduced by an average of 10%, feelings of unconditional love increased by an average of 5%, and overall wellbeing scores increased by an average of 12%. Though responses on the sliders were not part of our pre-planned hypotheses, we also noted that responses on the experimental physical, emotional and spiritual wellness sliders were significantly correlated in the expected directions with three of the four dependent variables, supporting the validity of the slider assessments. However, responses on the unconditional love measure were not correlated with responses on any of the sliders, suggesting that the unconditional love measure may capture a component of wellbeing that is non-overlapping with physical, emotional, or spiritual wellbeing (see below).

It is unlikely but possible that the changes measured during this study were due to demand characteristics, even though design partners knew our intention was to increase wellbeing. They reported liking our team, so they could have wanted to please us by showing us that they'd changed throughout the study. In support of this point, design partners who were in the recording-first condition reported consistently lower levels of physical symptoms of stress throughout the study, suggesting that scores on the physical symptoms of stress measure was the dependent variable most likely to be affected by task order – potentially resulting from disappointment at not being selected for the recording-first group. On the other hand, task order impacted improvement patterns (not simply absolute reporting levels). When task order was taken into account, participants who did the recording task first showed significantly greater reductions in their physical symptoms of stress scores compared to those who did the quote task first, a pattern that is difficult to understand based on a demand-characteristic interpretation. It is also worth noting that because the updates in the software requested by participants were provided to all participants regardless of group, the differential group effects observed here cannot be explained by these software updates. Overall, these results partially supported Hypothesis 2, that dependent variables would improve more in the recording-first versus quote-first group. This was only confirmed by significantly more improvement in the time perspective (dBTP) measure for the recording-first versus quote-first group, but for the three remaining dependent variables, significant improvements were greater in the recording-first group, and thus in the direction of supporting Hypothesis 2.

We were surprised that participants with higher amounts of self-reported childhood trauma seemed to find Time Machine particularly effective. The recurring assessments revealed significantly worse deviations from a balanced time perspective and overall wellbeing scores for design partners with many adverse childhood experiences (higher ACES scores) on the first recurring assessment, in partial confirmation of Hypothesis 3 and in opposition to a demand-characteristic hypothesis. Scores on the physical symptoms of stress and unconditional love measures, however, did not show a significant difference dependent on ACES scores at this same time point. However,

while the time perspective measure remained significantly worse throughout the study for those with higher versus lower ACES scores, scores on the overall wellbeing measure were significantly worse only at the start of the study – later, individuals with greater childhood trauma essentially caught up to those with less childhood trauma with respect to overall wellbeing scores. This disassociation between the time courses of improvements in time perspective and improvements in overall wellbeing scores may potentially be explained by changes in feelings of unconditional love, as discussed below. Regardless, the significantly greater improvement on the overall wellbeing measure among design partners with higher ACES scores, combined with no significant differences in improvement on any other dependent variable, provides clear evidence *against* Hypothesis 4, which was that those with higher ACES scores would improve *less* on all dependent variables than those with lower ACES scores. When considered separately, data from both lower- and higher-ACES design partners revealed significant first-to-last improvements. However, for design partners with higher ACES scores, overall wellbeing scores increased by 16% – significantly more and twice that of the increase shown by design partners with lower ACES scores. Although any differential findings between groups with relatively lower and higher ACES scores could be due to differences in depression, anxiety, or other confounding variables – the result remains that individuals who reported greater amounts of early childhood trauma also reported, on average, twice as much improvement in the overall wellbeing measure, regardless of concomitant mental health diagnoses. To explain these population differences with response bias we would have to resort to some kind of collusion among the participants, which we think highly unlikely. Assuming no collusion, these results suggest that regardless of early childhood trauma, our design partners improved on the most critical measure of wellbeing – their overall sense of wellbeing.

Further evidence that the improvements were not entirely due to response bias arise from the results of the regression analyses and the *post-hoc* moderation and mediation analyses. The regression results indicated that both the number of optional logins and task order were related to changes in the time perspective and overall wellbeing measures, such that more optional logins and being included in the recording-first group predicted greater first-to-last improvements in time perspective and overall wellbeing scores. These results partially supported Hypothesis 5, which was that improvements in all dependent variables would increase with increases in use during the optional study period. In addition, *post-hoc* moderation analyses revealed that first-to-last improvements in time perspective and the overall wellbeing measure were moderated by the number of optional logins, significantly so for overall wellbeing scores. These results indicate either that individuals who reported greater improvements on the overall wellbeing measure were more likely to log in and do the recording task during the optional period, or that the recording task actually influenced improvements in overall wellbeing. Either way, they do not suggest response bias as a driving factor for the changes reported over time. Based on these data, and especially due to the differential task order and optional login effects, we conclude that the time travel narrative task – the recording task itself – was a driving factor in the positive shifts of the four dependent variables.

Finally, it appears that feelings of unconditional love may have played a unique role in the constellation of changes that occurred during the course of this study. First, *post-hoc* analyses revealed that improvements in feelings of unconditional love during the required portion of the study (days 2 to 14) positively predicted first-to-last improvements in both time perspective and overall wellbeing scores. Second, *post-hoc* mediation analyses revealed that, following performance of the two required tasks, greater feelings of unconditional love were likely to have positively influenced an existing relationship between a more balanced time perspective earlier in the study and a better final overall wellbeing score. Taken together with the fact that scores on the unconditional love measure were the only of the four dependent variables that did not correlate with responses on the wellness sliders, these results indicate that feelings of unconditional love may have a unique role to play in improvements in both time perspective and overall wellbeing.

These results, while promising, are limited in several important ways. First, all design partners were paid for their participation at a fairly high rate, given the amount of time involved (see Methods). For the reasons cited above it is unlikely they were being dishonest about their actual experiences, but the payment certainly motivated them to complete the study. While the results are convincing in terms of their positive impact on the participants, it is possible that it may be difficult to create a version of the technology that would be engaging enough to create enduring habits among unpaid individuals. To mitigate this limitation for future versions of Time Machine, we plan to create a more engaging interface as well as provide additional resources and opportunities for social connection among participants.

A second major limitation is that all of our effects derive from self reports. Though we do not think response bias had a major role to play here, it is also the case that people do not always have an accurate grasp on the subtler aspects of their wellbeing. Further, it is possible that a placebo effect created by the positive rapport with the design partners and the payment strategy is responsible for these results, even though the complex and ultimately coherent patterns in the results suggest that if this is a placebo effect, it is one that will be difficult to differentiate from a treatment effect. Thus future research might usefully include behavioral, implicit, or follow-up measures to further verify any effects on wellbeing.

Third, we are confident the positive quantitative results were at least partially due to the fact that our participants became well informed about the science and psychology of hope and time perspective by attending a focus group on day 1 of the study. Thus the scalability of the technology has yet to be seen. A version of Time Machine with an introductory informational and motivational video covering the essential aspects described in the focus group is being planned to mitigate this concern.

Fourth, our *post-hoc* moderation and mediation analyses are really a blunt, first-pass attempt at informing a model that accurately represents the contributions of the study parameters examined here, so we do not put much stock in the relative importance of the factors revealed by those analyses

(Nathans et al., 2012). In future work with more participants, the relative contribution of each factor could be more thoroughly investigated by using an approach such as assigning each feature an importance value (e.g., "SHAP;" Lundberg and Lee, 2017).

Finally, this study only had 96 participants and was performed over 26 days – a larger study group over a longer period of time would help to further shed light on the effectiveness of self-serve time-travel narrative technology such as Time Machine.

Research Context and Implications for Future Work

The time travel narrative approach supports the habit of creating positive personal narratives that weave the present moment into the future of an individual, for instance, by imagining that one can correspond with oneself over time by taking into account what an older, wiser version of oneself might say (Newsome, 2004). It is not surprising this approach was effective, given that even outside therapeutic or counseling contexts, brief interventions aimed at increasing the extension and adaptivity of future narrative thinking and/or goal-directed behavior resulted in fewer alcoholic drinks among alcoholics (Snider et al., 2016), reduced binge drinking in college students (Murphy et al., 2012), and increased physical activity in young adults (Hall and Fong, 2003). Further, within therapeutic or school counseling contexts, positive results have been reported from case studies in which people were coached to create a coherent and positive narrative connecting to their future selves. Examples include at-risk students (Newsome, 2004; Kress et al., 2011; Madden et al., 2011), patients with PTSD (Palgi and Ben-Ezra, 2010; Palgi et al., 2014), individuals with trauma histories (Kress et al., 2008), and those with self-injury behaviors (Hoffman et al., 2010). The present study offers the novel finding that individuals, especially those with a history of childhood trauma and neglect, could self-administer the time-travel narrative intervention in a way that effectively boosted their wellbeing within the course of a month.

To our knowledge, this is one of only three existing studies that uses a clearly defined description of unconditional love to assess feelings of unconditional love over time (Mossbridge et al., 2018, 2021), and the first study to show mediation of any effect by feelings of unconditional love. We were motivated to check for the mediation effect based on a previous study in which feelings of self-transcendence mediated the relationship between participation in a community-based wellbeing program and psychological wellbeing outcomes (Vieten et al., 2014). Self-transcendence in that study was defined as "a term used to describe (a) a desire to discover meaning in human life, (b) a growing spirituality involving both an expansion of boundaries and an increased appreciation of the present, or (c) a developmental process that forms a pathway to wisdom" (Vieten et al., 2014, p. 5, references removed). We noted the similarity between their definition of self-transcendence and our own definition of unconditional love as presented to the participants, which included a reference to everything that exists reaching its greatest possible fulfillment, a concept consistent with self-transcendence (see Methods for definition). Also, the similarity between unconditional love and self-transcendence has been pointed out previously (Goertzel et al., 2017; Staudigl, 2017). Taken together, our result showing that unconditional love mediated the relationship between time perspective and wellbeing can be considered somewhat of a replication of the results from Vieten et al. (2014).

Future Western psychological and medical clinical practitioners will likely integrate a fuller picture of human spirituality into their work, given the efficacy and growing cultural appreciation of this approach (e.g., Koenig, 2000; Sperry, 2001). At the same time, app use among both medical providers and clinical psychology patients is on the rise (Franko and Tirrell, 2012; Miralles et al., 2020). These two trends are likely to merge. However, we agree with Koenig (2000) that "Physicians should not "prescribe" religious beliefs or activities for health reasons," but that "Physicians should acknowledge and respect the spiritual lives of patients, and always keep interventions patient-centered" (p.1708). In line with this philosophy, we think creating time travel narrative technology offering minimally instructive self-service interventions allows each individual to determine their own level of religious or spiritual involvement in the process, which can surely change over time.

Finally, it is likely that including self-transcendent concepts (like unconditional love) within the context of these technologies will support positive changes in wellbeing, at least when those concepts are also introduced in a "live" focus group prior to using such technologies. Certainly, the interpersonal relationships and caring intersubjective experiences forged in even a brief interaction can motivate change (e.g., Mitchell, 2014; Siegel, 2012; Stern, 2018). Thus it remains to be seen whether in-person or "live" clinical introduction of spiritual technologies such as these is required to produce the greatest impact on wellbeing, but we have little doubt future innovation will allow for scalable self-transcendence and its positive effects.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Institute of Noetic Sciences IRB approval: MOSJ_2020_01. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

JM, KJ, PW, AW, and MS: substantial contributions to the conception or design of the work AND the acquisition, analysis, or interpretation of data for the work, provide approval for publication of the content, and agreed to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. JM, PW, and MS: drafting the work or revising it critically for important intellectual content. All authors contributed to the article and approved the submitted version.

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Development of an Instrument to Assess Spirituality: Reliability and Validation of the Attitudes Related to Spirituality Scale (ARES)

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Background: Several instruments that measure spirituality present overlaps with positive emotions, impacting the interpretation of their findings. In order to minimize these problems, we aimed to develop, assess the reliability and validate a new scale to evaluate spirituality.

Methods: The instrument was designed using a theoretical framework minimizing tautological issues (i.e., Koenig's framework), a qualitative study investigating the definitions of spirituality, the development of the first version of instrument by experts' meetings and a qualitative cognitive debriefing. Then, the instrument was examined for its content validity by a multidisciplinary group of judges and was pilot-tested in two different groups – less religious (medical students – $n = 85$) and more religious (practicing religious members – $n = 85$). Finally, psychometric properties and validity were assessed.

Results: The developed Attitudes Related to Spirituality Scale (ARES) is a self-report 11-item instrument using five-level Likert items. ARES presented appropriate psychometric properties revealing excellent internal consistency (alpha = 0.98) and temporal stability (ICC = 0.98). Likewise, ARES was strongly correlated with other validated R/S instruments (i.e., Duke Religion Index and Brief Multidimensional Measure of Religiousness/Spirituality) and was able to discriminate higher and lower religious groups. In the exploratory factor analysis, a unidimensional structure of the scale was described. Fit indices for the scale demonstrated good fit in the unidimensional model.

Conclusion: The ARES is a reliable, valid and stable one-dimension instrument that is appropriate for use in the Portuguese-speaking population.

Descriptors: Spirituality; Scale; Factorial Analysis; Instrument; Measure; Psychometrics.

Keywords: spirituality (MeSH), scale, factorial analisys, instrument, measure, psychometrics

INTRODUCTION

A growing number of publications have examined spirituality and religiosity (S/R) and their relationship to health, generally showing favorable effects of spiritual beliefs on both physical and mental health (Sawartzky et al., 2005; Moreira-Almeida et al., 2014; Bai and Lazenby, 2015). Likewise, spiritual and religious practices have an impact on individuals' lifestyles showing an effect on moral and ethical values (Gonçalves et al., 2015).

Spirituality is a complex concept and, by involving subjective experiences, many individuals have their own definition of this term. Even those who share the same cultural and social experiences may have different ways of understanding and expressing their spirituality. Historically, spirituality was strongly linked to religion (Koenig, 2008). The contemporary view of spirituality and recent studies have shown the use of the term spirituality detached from religion and religiosity, and the emergence of "spiritual but not religious" individuals (Larson et al., 1998). Spirituality and religiosity are overlapping constructs, but most researchers agree that there is a difference between them. In a study on concepts about these constructs, an in-depth content analysis was conducted by the authors about definitions of spirituality, religiousness, faith, and the sacred. It was observed that spirituality is more specifically related to the search for or to the relationship with the sacred, while religiousness is considered a ritual, institutional or codified spirituality that is culturally sanctioned (Harris et al., 2018).

There are several definitions of spirituality being used in the literature without a consensus. Some authors adopted a narrower view, in which spirituality is necessarily linked to the sacred or transcendence such as noted in the definition provided by Harold Koenig ("a personal search for understanding were related to larger existential issues, i.e., the meaning of life, death; and its relations with the sacred and/or transcendent, without implying the formation of religious communities") (p. 18) (Koenig et al., 2012). In contrast, other authors adopted a broader view, which includes other aspects such as nature, arts, and family in the concept of spirituality. According to Puchalski and Romer (2000), spirituality is what "allows a person to experience a transcendent meaning in life, expressed as a connection with God, but including the relationship with nature, arts, music, family or community, or any beliefs and values give a person a sense of meaning and purpose in life" (p. 129). This discussion is seldom solved and is the target of several articles in recent years (Hill et al., 2000; MacDonald et al., 2015). Pargament and Mahone (2009) underscores that, although it is clear that spirituality differs from religion as an individual expression, adopting a broader view can have the problem of losing the "sacred core" of this conceptual field.

The present study was based on Koenig's definition of spirituality, as described above, and on the challenges of quantifying spirituality in clinical research. Koenig's definition tends to be more delimited concerning the central core of the concept of spirituality, which involves aspects related to the "sacred" and the "transcendent". It is important to point out that spirituality has, in part, an association with religious involvement, as spirituality can be considered as a way of life, which influences an individual's worldview, decisions, and behaviors (Koenig et al., 2012). However, Koenig's definition also allows the separation of those "spiritual but not religious" individuals which are those with spiritual beliefs, but not necessarily related to the involvement with religious communities (Koenig, 2008). Based on this theoretical model, it is important to use a definition that allows for a better examination of the relationship between spirituality and health in studies.

In summary, spirituality is a complex subjective concept, and it is necessary to quantify it for use in research, however, this has been a major challenge. Instruments that include broad definitions of spirituality in their theoretical basis (embracing aspects such as the feelings of tranquility, harmony, optimism, forgiveness, peace, and general well-being) can be considered problematic since they can overlap with psychological well-being measures and positive characteristics of mental health (Moreira-Almeida et al., 2006). This controversy over measurement implies a tautological question because the inclusion of indicators of psychological well-being in instruments to assess spirituality results in a positive correlation between spirituality and well-being. Another problem is the experience of secular individuals, who may also experience a sense of peace and harmony without necessarily being involved with the issue of spirituality. Extremely broad definitions led to the impossibility of differentiation, since practically all individuals can be considered spiritual, and as such, relations with mental health and behaviors cannot be studied (Larson et al., 1998).

The problem of tautology can be verified in different scales that are used worldwide. Tautology refers to the use of spirituality scales that contain "contaminated" items (i.e., items that assess positive experiences or psychological well-being of individuals). In other words, tautological instruments can be considered of limited value for research because, by definition, they can be expected to be predictably correlated with items that elicit information about psychological well-being. The Functional Assessment of Cancer Therapy (FACIT-SP; Peterman et al., 2002), for example, is a scale usually used in the oncological context and presents items such as "I feel peaceful", "I am able to reach down deep in myself for comfort" and "I feel a sense of harmony within myself". Another frequently used scale, the Daily Spiritual Experiences Scale (DES; Underwood and Teresi, 2002) includes statements such as: "I feel a deep inner peace or harmony", "I feel a selfless caring for others" and "I accept others even when they do things that I think are wrong". The items mentioned above for these scales validated in Brazil could be characterized as a tautological issue because what they intend to evaluate is much more related to concepts of psychological well-being than spiritual issues. This is because they have used very broad concepts of spirituality in their definitions, that encompass other positive experiences. This is a problem since patients with severe depression or anxiety, for instance, will not consider themselves peaceful and, for this reason, will not be

Abbreviations: ARES, attitudes related to spirituality scale; BMMRS-P, brief multidimensional measure of religiousness/spirituality; CI, concordance index; CVI, content validity index; FACIT-Sp-12, functional assessment of chronic illness therapy – spiritual well-being scale; ICC, intraclass correlation coefficient; KMO, Kaiser-Meyer-Olkin; SPSS, statistical package for social sciences.

considered spiritual in such scales, even if they have spiritual beliefs. When we do not consider the tautological concept, we indirectly assume that only spiritual persons experience peace, harmony, and care deeply about others, and for this reason, the spirituality assessment is overlapping with its outcome (Moreira-Almeida et al., 2006; Koenig, 2008).

Koenig et al. (2012) points to possibilities for developing non-tautological measures of spirituality. First, the instrument should not include items that clearly tap positive psychological aspects or are related to mental health (feelings of peace, tranquility, harmony, and comfort). Second, spirituality should be measured using questions about beliefs, practices, attitudes, degree of commitment, and level of motivation. According to the author, this will allow for a better delineation between religion, spirituality, and health without confusion.

In this context, new instruments that are based on non-tautological frameworks of spirituality are welcome in the literature. Even though other instruments are assessing this construct, most of them were developed in high-income countries with Anglo-Saxon backgrounds (Monod et al., 2011; Sessanna et al., 2011; de Jager Meezenbroek et al., 2012), which are developed under different cultural visions and assumptions. Therefore, culturally adapting available international instruments could result in biases of interpretation for middle to low-income populations.

Unfortunately, in our search of the literature, instruments designed to be applied in developing countries and with different cultural backgrounds are yet scarce. Furthermore, a systematic review carried out in the Brazilian context found twenty instruments to assess spirituality and religiosity for health research in Brazil and Portugal. It was observed that most of the instruments mentioned in that review, according to the authors' assessment, do not present all the psychometric properties (Lucchetti et al., 2013b). In addition, none of the instruments questioned the tautological issue of the scales of spirituality, representing an important gap.

Advances in new instruments in this area could contribute to a closer examination of the relationship between physical health, mental health, and spirituality (Larson et al., 1998). To bridge this gap, the present study aimed to develop, assess the reliability of and validate a new scale to evaluate spirituality in the Brazilian context, named the ARES – Attitudes Related to Spirituality Scale.

MATERIALS AND METHODS

To create a new instrument to assess spirituality in Brazil, two different phases were followed. The first phase was the instrument's development, and the final phase consisted of validity and reliability studies of the developed instrument.

Phase 1: Development of the Instrument

The instrument was developed in four stages:

(a) Theoretical framework: for the present study, aiming to minimize the tautological problems of previous instruments as discussed previously, we adopted the concept of spirituality proposed by Koenig (Koenig et al., 2012), which is based on a definition of the term spirituality as a more transcendental and sacred dimension and allows for differentiation of spiritual experiences as opposed to religious practices, including those who consider themselves "spiritual", but not as "religious" individuals (Koenig, 2008). The theoretical model was decisive for the construction of the scale, as it minimized the overlapping with other constructs such as positive characteristics of mental health and psychological well-being.

(b) Qualitative study for item generation and construction: To develop the items of ARES, a qualitative study including a convenience sample of 60 individuals was carried out, following our theoretical choice of reference (i.e., non-tautological theory). The objective of this preliminary study was to assess how this population understood spirituality and to contribute to the development of the items using the question "How do you define spirituality?". Tautological answers (e.g., answers overlapping with well-being and mental health) were excluded since they did not support our theoretical framework (see above). In this study, the sample consisted of graduate and undergraduate students and employees from different professional categories and different cultural backgrounds from a public university who were approached personally, invited at that time, and voluntarily agreed to participate. The inclusion criteria were individuals over 18 years old who agreed to participate and signed the informed consent form and all the invited individuals agreed to participate. Of this sample, 52% of the participants were female, with a mean age of 39 years (SD = 16 years). In terms of schooling, 35% of the participants had completed higher education. The interviews were conducted face-to-face by the first author in a single meeting taking approximately 20 min. Answers to the target question were analysed according to Bardin's content analysis method (Bardin, 2009). It uses thematic categories, trying to detect elements and then dividing them into categories, identifying what they have in common. The content analysis technique consists of three stages: pre-analysis, exploration of the material and treatment of the results/interpretation. In the first stage, also known as the organization phase, we used a reading of the material and the initial survey of hypotheses that could guide the final interpretation, based on existing concepts of spirituality and discussed in the literature. In the second stage, the data was encoded from the registration units, creating categories. The categories identified based on the literature on spirituality were spirituality as transcendence, spirituality as religious beliefs and spirituality as positive emotions and feelings. In the third stage, the elements were classified according to their similarities, allowing their grouping into the discriminated categories. In this last phase, which is also known as the data interpretation phase, it was necessary to return to the theoretical framework used in this work, seeking to support the analyses, giving meaning to the interpretation.

(c) Development of the instrument: based on the material collected in the steps described above, a committee of experts was invited to carry out the operationalization of the items of the first version of the scale. The committee was composed of five professionals, who were invited based on their experience in spirituality research (an occupational therapist and two psychiatrists) or in the field of psychometrics (a psychiatrist and a

pharmacologist). They created a set of items with the potential to assess spirituality. These were generated from concepts discussed in the existing literature (theoretical model adopted for this study) and based on statements obtained through the qualitative study of definitions of spirituality. With the above considerations, the first version of the scale was constructed, aiming to be brief, non-tautological and adhering to the conceptual framework. The items were revised; the redundant or biased items were eliminated. More details concerning the statements and items are provided below and in the **Supplementary Material Additional file 1**.

(d) Test for understanding of the items (qualitative cognitive debriefing): the objective of this stage was to test the understanding and to make a semantic analysis of the proposed items. Face-to-face interviews were conducted with 30 participants (53.3% women) from a non-probabilistic sample formed by a cleaning and maintenance team from a university hospital. The interviewees' ages ranged from 18 to 58 years (M = 35 years and SD = 13 years). Of the total sample, 23% had nine years of schooling and 77% had 12 years of schooling. The participants were presented one item at a time; they then discussed any doubts and were asked for suggestions on the formulation of the items.

Figure 1 shows all the phases of the study and the ARES development.

Phase 2: Instrument Validity and Reliability Studies

(a) Content validity: Six judges were invited, consisting of three psychologists and three physicians, each of whom had expertise in the areas of spirituality and psychometrics. This panel of judges was composed of distinguished professionals from the committee that was invited to develop the items. The study proposal and the instrument in its full version were presented to these judges through an online form. These items were questioned, item-by-item, on the following aspects: (a) whether the item in question assessed what it intended to measure (**concordance index** – CI) and (b) whether the item was relevant or representative within the subject (**content validity index** – CVI; Alexandre and Coluci, 2011). These procedures measured the proportion of the judges who were in agreement regarding the content of the instrument and its items. A minimum agreement of 80% on each index indicated the validity of the scale. Where relevant, the judges suggested changes in the wording of the items of the instrument. The final version of the scale was translated into English by two native translators of a translation company (a British and an American translator) and is available below in the **Supplementary Material Additional file 2**.

(b) For the psychometric analysis of construct validity and reliability, two contrasting groups were recruited from non-clinical settings: a higher religious group composed of 85 religious assistants (volunteers who were responsible for spiritual and religious assistance) from a religious center and a lower religious group composed of 85 students of the School of Medicine of the University of São Paulo, Brazil (n = 170). Medical students were chosen because they have lower levels of religiousness as compared to the general population in Brazil (Lucchetti et al., 2013a). Moreover, the choice of students was considered because it is a more homogeneous group, coming from the same institution, as opposed to trained professionals, who could have different backgrounds and coming from different services. Construct validity's objective is to assess whether the instrument's items constitute a legitimate representation of the construct. Thus, this analysis aims to assess whether the instrument's items are related, justifying their grouping to represent the

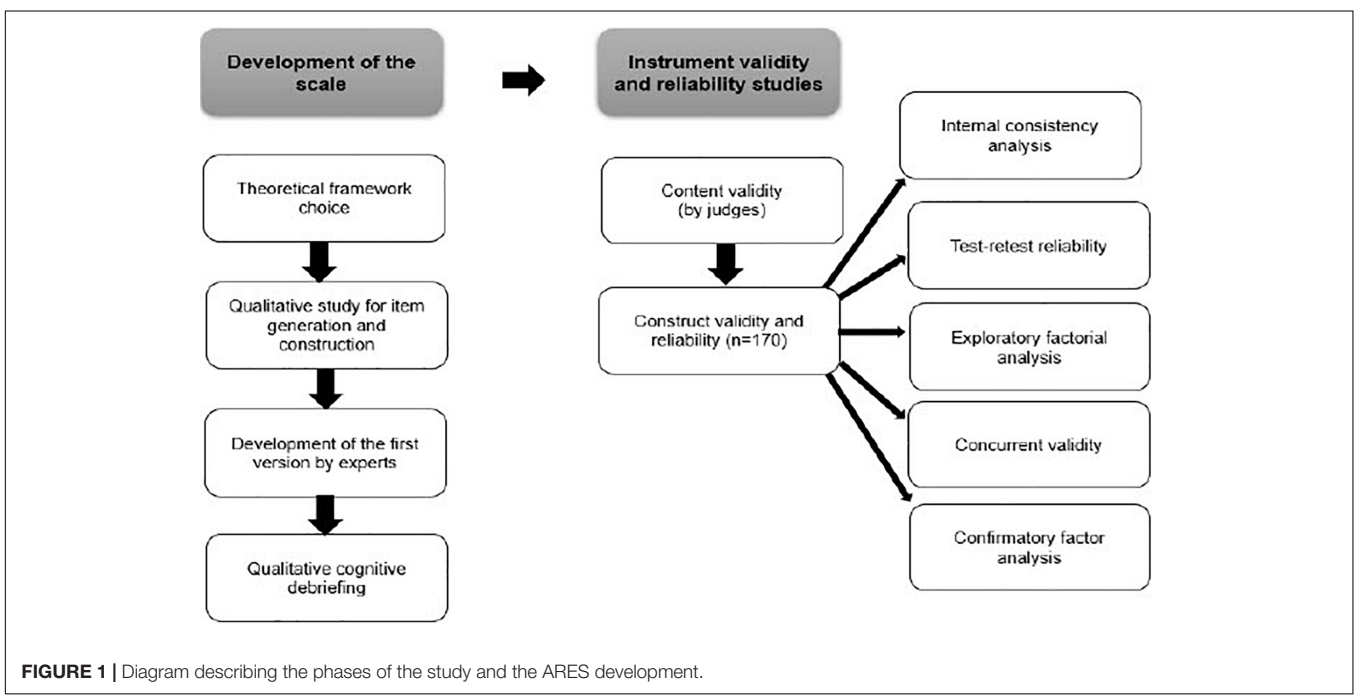

FIGURE 1 | Diagram describing the phases of the study and the ARES development.

dimensions of the construct (American Psychological Research Association, 1954). The sample size calculation was based on previous guidelines assessing sample sizes for validation studies, which consider the number of at least ten respondents for each item of the questionnaire (Hair et al., 2005; Anthoine et al., 2014). Using this guideline, the minimum sample size for the 11-item ARES scale was 110 participants. In the test-retest reliability analysis, the only ones who participated were the students ($n = 67$) who had answered the scale again after 15 days, since it was understood that the scale scores would certainly be stable in the high religious sample. Concurrent validity was assessed correlating ARES with other Brazilian validated S/R instruments [Duke Religion Index (Lucchetti et al., 2012) and the Brief Multidimensional Measure of Religiousness/Spirituality (Curcio et al., 2015)].

The Research Ethics Committee of the Medical School of the University of São Paulo approved the research protocol (no. 214/15) for the fieldwork and data collection. The participants were informed that the data would be treated with strict confidentiality and that no personal information would be disclosed. Participation was voluntary, and there was no form of compensation.

Statistical Analysis

The CVI used a Likert scale with a score of 1 to 4 to evaluate the relevance/representativeness of the answers, ranging from 1 = non-representative to 4 = relevant or representative item. Only the items marked by the judges with values of 3 and 4 were considered evidence of content representativeness (Grant and Davis, 1997). For all the following analyses, a sample with 170 participants was considered. For the construct validity, the possibility of conducting a factor analysis was verified by the Kaiser-Meyer-Olkin (KMO) criterion and Bartlett's sphericity test. The method of estimation of the factorial model that was used was Principal Axis Factoring (PAF). PAF is an exploratory approach and probably the most widely used method for factor analysis (Warner, 2012). It was used to find a structure of interrelations between the observed variables, determining the number and nature of the factors that best represent these variables. The criteria for determining the number of factors to be extracted was Kaiser's rule (eigenvalue > 1). Factor loadings above 0.30 were used as the criteria for retaining an item in each factor (Warner, 2012). Cronbach's alpha coefficient (Cronbach, 1951; Brown, 2002) was used to evaluate the internal consistency of the questionnaire. Kendall's coefficient of agreement and the intraclass correlation coefficient (ICC) were used to evaluate the test-retest reliability (Kendall et al., 1939; McGraw and Wong, 1996). Concurrent validity was assessed correlating ARES with other Brazilian validated R/S instruments using Spearman correlation coefficients (rho). In the discriminant validity, spirituality scores were compared for both groups using Mann–Whitney tests. Likewise, scores were classified into low and high spirituality/religiousness using the median values of the whole sample for each scale. Discriminant validity between known groups is a form of validity that aims to identify differences between groups in which these differences are theoretically expected to be found, using the hypothesis that groups of individuals perceived as different in relation to the construct to be measured, produce different values when the instrument is applied. This type of validity aims to assess the presence of differences in the measurements obtained between the groups, not whether the measure really measures the intended construct (Echevarría-Guanilo et al., 2018). Confirmatory factor analysis (CFA) with estimation by the robust weighted least squares (WLSMV) was used to provide evidence for construct validity. The Comparative Fit Index (CFI), the Tucker-Lewis Index (TLI), and Root-Mean-Square Error Approximation (RMSEA) were used to evaluate goodness-of-fit based on the following cutoff criteria: RMSEA estimate around or less than 0.08, and CFI and TLI greater than 0.90. Factor loading shows the variance explained by the variable on each factor of the model. We considered that factor loadings greater than 0.7 provide evidence that the factor extracts sufficient variance from that variable (Brown, 2006). Logistic regression models were carried out (high versus low scores on ARES) adjusting for gender (female/male), group (Religious/Medical students), age, marital status (married/not married), education (complete higher education/other) and income (up to 10 salaries/10 or more salaries). The analyses were performed by the Mplus, version 8.0. The data were analysed using the Statistical Package for Social Sciences (SPSS) 16.0 for Windows for all procedures, except for the Kendall's coefficient of agreement that was assessed using the program R, version 3.3.3. The level of significance considered was 5% (Hope, 1968).

RESULTS

Development of the Instrument

In the qualitative study for item generation and construction, according to the answers obtained from the participants, the material content analysis provided in the **Supplementary Material Additional file 1**, identified three categories of responses:

– First category (Spirituality as transcendence): respondents ($n = 27$) reported that spirituality is linked to the conception of transcendence, that is, there is something or someone beyond daily physical existence that is the source of support. The following was among the representative reports: "Spirituality is man's belief in something greater than the material reality that surrounds him'. "It is linked to faith, but not necessarily linked to religion". "It's something beyond the material world, where the spirit remains alive, to obtain personal evolution". "Connection with something or higher being, which brings meaning to our existence" (see **Supplementary Material Additional file 1**).

– Second category (Spirituality as religious beliefs): respondents ($n = 15$) reported that their spiritual experience or their understanding of spirituality comes from beliefs or from a religious tradition. The following was among the most relevant definitions: "It is something that is connected to the contact with God, to the religiosity, to the fact that the person comes into contact with God through prayer". "It's a balance and understanding of the relationship between religiosity and me". "It's what everyone feels about religion" (see **Supplementary Material Additional file 1**).

– Third category (Spirituality as positive emotions and feelings): respondents (n = 18) cited concepts similar to the definition of secularization, that is, they did not relate the concept of spirituality to religion or to a transcendent being but rather linked spirituality to positive emotions and feelings, doing good to others, greater awareness and ethics. The following was among the reports: "It is to have a positive or negative affect, it is linked to emotions, to the spirit itself". "Believe or have faith in yourself". "It is the thought of each person, to be aware of what we have to learn in this world". "Feeling good about yourself" (see **Supplementary Material Additional file 1**).

The definitions of spirituality proposed by the participants in the first and second categories (70% of the sample) were related to the chosen theoretical frameworks, showing that the population understood spirituality elements such as the belief in a reality beyond the material (transcendent), through connection with a superior force and, in an independent and sometimes overlapping way, the question of religion. The definitions proposed by the third category did not match the theoretical model chosen for the development of the scale, so they could result in items with tautological questions. Then, it was decided not to consider these statements for the development of the instrument.

From the answers of the participants in the qualitative study, 48 statements that fit the theoretical framework proposed for the study were selected. These statements generated 12 items (see **Supplementary Material Additional file 1**). Some contents were repeated in many answers of the participants and, because of this, the number of items was limited. No additional information was provided that could generate other items.

In the interviews to get an understanding of items, 30 individuals were approached. After analysing item by item, the participants noted the ones that generated the most doubt. The "Instructions" section was highlighted by the participants as the most difficult to understand, as well as the following items on the scale: "I have spiritual beliefs and values," "I have had unusual experiences that may have been spiritual experiences", "Spirituality leads me to have a positive connection with people" and "My life has a spiritual purpose". The rest of the items reached an appropriate understanding of at least 80% of the participants.

The results of the study were presented to the committee of experts, who analysed the suggestions of the participants and made modifications in the writing of the items that presented greater difficulty of comprehension. Based on the appreciation and amendments proposed by the committee of experts, a second version of the instrument was produced.

Psychometric Analysis

For the validity of the content, the full scale consisting of 12 items was presented to the judges. According to the judges' answers, items 5, 8, and 9 of the scale ("Spirituality encourages me to help others", "I have had experiences that I could not explain, which may have been spiritual experiences" and "I believe in life after death", respectively) did not reach the minimum of 80% in the CVI, as delineated in the methods (Alexandre and Coluci, 2011). Item 8, for not having reached the minimum of 80% in both the CI and the CVI, was eliminated from the instrument. It was decided that items 5 and 9 would be kept since changes were made to their wording that resulted in greater relevance, a decision that reached agreement among the judges regarding the adequacy of the construct that was intended to be evaluated. However, changes were made to the wording of these according to the judges' suggestions. After the evaluation and improvement

TABLE 1 | Sociodemographic characteristics of the samples.

Variables	Total (n = 170)		Re (n = 85)		Med (n = 85)	
	Mean	SD	Mean	SD	Mean	SD
Age	**41.6**	**20.1**	**59.8**	**11.6**	**23.4**	**2.3**
	n	%	n	%	n	%
Gender*						
Male	81	47.6	32	37.6	49	67.6
Female	89	52.4	53	62.4	36	42.4
Occupation §						
Employee	45	26.5	43	50.6	2	2.3
Unemployed	1	0.6	1	1.2	0	0.0
Work without remuneration	3	1.8	2	2.3	1	1.2
Retired	39	22.9	39	45.9	0	0.0
Only studying	82	48.2	0	0.0	82	96.5
Marital Status §						
Not married	112	65.9	29	34.1	83	97.6
Married	43	25.3	41	48.2	2	2.4
Divorced	12	7.0	12	14.1	0	0.0
Widower	3	1.8	3	3.6	0	0.0
Schooling §						
Less than 4 years	3	1.8	3	3.5	0	0.0
9 years	3	1.8	3	3.5	0	0.0
Less than 12 years	4	2.4	4	4.7	0	0.0
12 years	17	10.0	16	18.8	1	1.2
Incomplete university education	82	48.0	3	3.5	79	92.9
Complete university education	61	36.0	56	66.0	5	5.9
Income + §						
Less than 1 minimum wage	1	0.6	0	0.0	1	1.2
1 to 2 minimum wages	8	4.8	6	7.1	2	2.4
2 to 3 minimum wages	17	10.1	12	14.1	5	6.0
3 to 5 minimum wages	29	17.3	19	22.3	10	12.0
5 to 10 minimum wages	37	22.0	23	27.1	14	17.0
10 to 20 minimum wages	44	26.2	19	22.3	25	30.1
More than 20 minimum wages	32	19.0	6	7.1	26	31.3
Religious Affiliation*						
No	39	23.0	0	0.0	39	46.0
Yes	131	77.0	85	100.0	46	54.0
Which § ±						
Catholic	27	20.6	0	0.0	27	58.7
Evangelical	5	3.8	0	0.0	5	10.9
Spiritism	92	70.2	85	100.0	7	15.2
Afro-brazilian religions	1	0.8	0	0.0	1	2.2
Others	6	4.6	0	0.0	6	13.0

n, absolute frequency; %, percentage; SD, standard deviation; Re, religious assistants; Med, medicine students.

+ Two participants did not report their income, both medical students.

± Total of 131 participants who answered Yes in religious affiliation.

TABLE 2 | Exploratory factor analysis for the ARES (n = 170).

Domain assessed by each item		Factor
Portuguese original version	**English translated version***	**Factorial load**
Item 1 – Eu acredito em algo sagrado, transcendente (Deus, uma força superior).	Item 1- I believe in something sacred or transcendent (God, a higher force).	0.91
Item 2 – Meditação, oração, leituras e/ou contemplação são práticas que utilizo (ao menos uma delas) para me conectar com uma força espiritual além de mim.	Item 2 – Meditation, prayer, readings and/or contemplation are practices that I use (at least one of them) to connect with a spiritual force beyond myself.	0.92
Item 3 – Já presenciei fatos/situações que me levaram a acreditar que existe algo além do mundo material.	Item 3 – I have witnessed facts/situations that have led me to believe that there is something beyond the material world.	0.88
Item 4 – Minha fé ou crenças espirituais me dão apoio no dia-a-dia.	Item 4 – My faith or spiritual beliefs sustain me on a daily basis.	0.96
Item 5 – Minha espiritualidade me ajuda a ter um relacionamento melhor com os outros.	Item 5 – My spirituality helps me have a better relationship with others.	0.95
Item 6 – Minha espiritualidade influencia minha saúde física e mental.	Item 6 – My spirituality influences my physical and mental health.	0.94
Item 7 - Minha espiritualidade me incentiva a ajudar outras pessoas.	Item 7 - My spirituality encourages me to help others.	0.94
Item 8 – Eu acredito em uma continuidade após a morte.	Item 8 – I believe in continuity after death.	0.91
Item 9 – Minhas crenças e valores espirituais direcionam minhas ações no dia-a-dia.	Item 9 – My spiritual beliefs and values guide my day-to-day actions.	0.91
Item 10 – Minha fé ou crenças espirituais dão sentido à minha vida.	Item 10 – My faith or spiritual beliefs give meaning to my life.	0.94
Item 11 – Práticas espirituais (por exemplo: fazer orações, ou jejum, ou meditação ou outras) ajudam a manter ou melhorar a minha saúde física ou mental.	Item 11 – Spiritual practices (e.g., praying, fasting, meditation or other) help maintain or improve my physical or mental health.	0.85
Eigenvalue		9.53
% variance		86.6
KMO		0.95
Bartlett's Test		$p < 0.001$

**The American Journal of Experts – AJE provided the English translated version of the items.*

proposed by the judges, the instrument was discussed and approved by the committee of experts, and the final version with 11 items was submitted to the next psychometric analysis.

For the following validation and reliability analyses, students and religious assistants were approached (N = 170). ARES is a 11-item-Likert scale whose values vary from 1 (Totally Disagree) to 5 (Totally Agree) for each item. The possible scores range from 11 to 55. Among the respondents, there were a total of five missing observations, which were replaced by the category "Neither agree nor disagree".

Regarding the characteristics of the sample, the ages of the religious group varied between 29 and 82 years, with an average of approximately 60 years (SD = 1.3 years). In the group of students, the ages ranged from 20 to 36 years, with a mean of 23 years (SD = 0.2). **Table 1** shows the sociodemographic characteristics of the samples. All variables were significantly different ($p < 0.05$) between groups.

As a result of the internal consistency analysis, the Cronbach's alpha coefficient was found to be 0.98, indicating the level of homogeneity of the scale items (see **Supplementary Material Additional file 3**).

For the test-retest reliability analysis, the scale was again applied to a group of 67 medical students 15 days after the initial test. The Intraclass Correlation Coefficient (ICC) was obtained considering the total scores, resulting in an ICC of 0.98 (95% CI = 0.97 – 0.99). For the results obtained from the test-retest agreement of each item, it was verified that the concordance of all items was relatively high and significant ($p < 0.05$) (see **Supplementary Material Additional file 4**).

The factorial structure of the questionnaire was verified through an exploratory factorial analysis (**Table 2**), considering the responses of the first application of the 11 items in all the individuals. According to the set of criteria considered in this analysis, a single factor was extracted, explaining 86.69% of the total variability of the data and showing its one-dimensional structure. A high correlation was observed between the items of the scale.

Concerning the concurrent validity, ARES score was significantly correlated with other validated R/S scales, presenting high correlation with BMMRS-P (rho = 0.88) and the Duke Religion Index (rho = 0.90) (**Table 3**).

Finally, ARES was able to significantly differentiate the high religious and the low religious groups, as observed with Duke Religion Index and Brief Multidimensional Measure of Religiousness/Spirituality as well (**Table 4**). The results were maintained even after adjusting for gender, age, marital status, education level, and income (see **Supplementary Material Additional file 5**).

TABLE 3 | Correlation between attitudes related to spirituality scale, duke religion index and brief multidimensional measure of religiousness/spirituality.

	ARES	BMMRS-P	DUREL
ARES	1.00	0.88 ($p < 0.001$)	0.90 ($p < 0.001$)
BMMRS-P		1.00	0.89 ($p < 0.001$)
DUREL			1.00

TABLE 4 | Summary measures for scale scores brief multidimensional measure of religiousness/spirituality, duke religion index and attitudes related to spirituality scale.

Score	Group	N	Q1	Median	Q3	Mean	Standard Error	*p*-Value
BMMRS-P*	Re	82	71.0	75.0	78.0	74.4	0.6	<0.001
	Med	79	32.0	48.0	61.0	47.3	1.7	
	Total	**161**	**48.0**	**68.0**	**75.0**	**61.1**	**1.4**	
DUREL*	Re	83	14.0	15.0	15.0	14.5	0.1	<0.001
	Med	85	3.0	7.0	11.0	7.2	0.5	
	Total	**168**	**6.8**	**13.0**	**15.0**	**10.8**	**0.4**	
ARES*	Re	85	54.0	55.0	55.0	54.6	0.1	<0.001
	Med	85	18.0	40.0	47.0	34.5	1.7	
	Total	**170**	**40.0**	**53.5**	**55.0**	**44.5**	**1.1**	

*N, sample size; Q1, first quartile; Q3, third quartile; Re, religious assistants; Med, medicine students. *Mann–Whitney test.*

Fit indices for the scale demonstrated good fit in the unidimensional model, with X^2 = 67.008 and *p*-value 0.0143, RMSEA estimate = 0.055, CFI = 1.000, and TLI = 0.999. All the factors loading showed greater values than 0.9 (**Figure 2**).

DISCUSSION

The present study developed and validated a new measure to assess spirituality in the Brazilian context, the ARES (see the complete version of the scale in Portuguese and the proposed English version in the **Supplementary Material Additional file 2**). This instrument had conceptual and temporal stability, was able to discriminate the religiousness and spirituality of the participants and correlated well with other measures. To our knowledge, ARES is the first instrument focusing on non-tautological aspects to be developed in the Portuguese language and one of the few instruments originally developed from participants from middle and low-income countries.

Since ARES does not include tautological aspects, it could be an important tool for the advancement of this field of research, since most of the previous instruments to assess spirituality include items that overlap with aspects of positive mental health. This confusion and overlap were observed in our qualitative study where part of the sample considered spirituality as a synonym of positive emotion. According to the theoretical framework used in ARES, this relationship could impair the correct interpretation of the findings of the spirituality studies and have been extensively discussed by authors (Moreira-Almeida et al., 2006; Koenig, 2008).

Regarding the psychometric analysis of the ARES, it is essential to verify the psychometric analysis of an instrument so that one can choose a valid and reliable measure for use in both clinical and research contexts (Lucchetti et al., 2013b). In this study, Cronbach's alpha coefficient was high, indicating an appropriate internal consistency of the instrument. Although using different instruments, our results are comparable to other validated spirituality assessment tools for the Portuguese language, which presented satisfactory to excellent internal consistencies: Daily Spiritual Experiences Scale (alpha = 0.91) (Kimura et al., 2015), Brief Multidimensional Measure of Religiousness/Spirituality – BMMRS-P (alpha = 0.88) (Lucchetti et al., 2012), FACIT-Sp (alpha = 0.89) (Lucchetti et al., 2015) and Spiritual Well-being Scale (alpha = 0.92) (Marques et al., 2009). Likewise, the test-retest analysis proved to be high and comparable to previous published instruments (Kimura et al., 2015; Lucchetti et al., 2015). In the analysis of the main components, it was observed that ARES has a

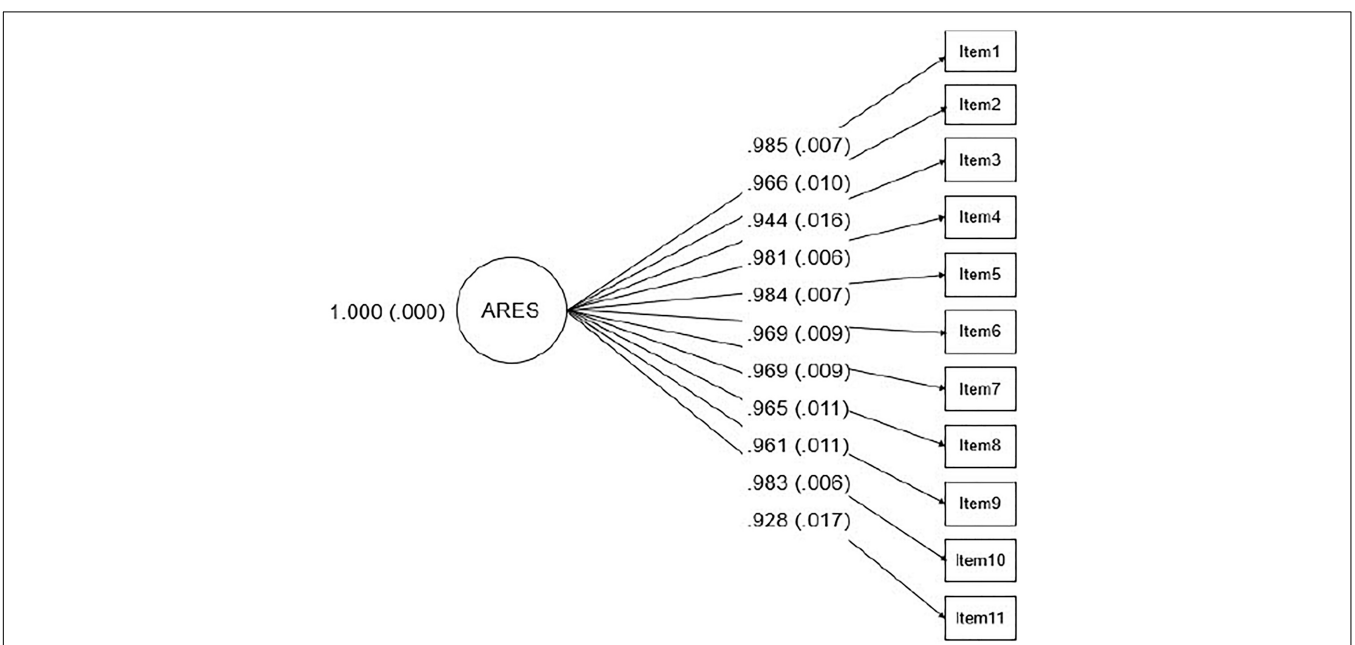

FIGURE 2 | Diagram of the latent model, representing one factor solution for ARES, with standardized factor loadings and their standard errors in parentheses.

one-dimensional structure, allowing researchers to infer that the greater the sum of the scores of the items is, the greater the individual's spirituality.

Regarding the methodological limitations, first it is important to note that, for the qualitative study of the definitions of spirituality, a convenience sample was selected, which may have resulted in a selection bias. For a future study, a representative Brazilian sample should be recruited to better understand the spirituality profile of this population. Second, in our study, the content analysis was performed by only one researcher. Although this could be considered a potential limitation, qualitative researchers underscore that content analysis can be performed by only one researcher as well (Harding and Whitehead, 2013). However, we understand that the cross-validation of the analysis would make the study more rigorous. Third, we obtained a smaller number of items in the participants' responses, as we only used the responses that corroborated the theoretical model adopted for this study (i.e., non-tautological framework corresponding to 70% of the answers). Forth, the items were not sent back to the judges. However, the items were thoroughly discussed and approved by the committee of experts as described previously. Another limitation was the fact that the high religious group was composed by followers of a specific religion and the non-religious group was composed by university students. Although this could be a potential bias, this strategy was adopted to guarantee that this sample had high levels of R/S and could be appropriately discriminated from the sample of university students. Likewise, the sociodemographic differences between groups were adjusted in the models as well. It is also important to note that the sample size is slightly smaller than that recommended for carrying out a CFA (Flora and Curran, 2004). For further studies, members and followers of other religions and beliefs, as well as, indigenous, agnostics and atheists should be approached, to verify the instrument's discriminant capacity. Finally, although several statements emerged from the qualitative analysis, expert meetings have determined the most representative ones and, for this reason, some statements were not included due to repetition, resulting in this brief 11-item instrument.

The Portuguese version of the ARES showed that it is an instrument capable of assessing spirituality through appropriate psychometric properties, which indicates that the ARES can be an important tool for exploring the impact of spirituality on different outcomes and populations. The non-tautological nature of the instrument could serve as a potential reference instrument to be used in research all over the world. Future studies should investigate the feasibility of using this instrument in other cultural backgrounds and other languages.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by The Research Ethics Committee of the Medical School of the University of São Paulo. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct and intellectual contribution to the work, and approved it for publication.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.764132/full#supplementary-material

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SYSTEMATIC REVIEW
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Defining Spirituality in Healthcare: A Systematic Review and Conceptual Framework

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Objective: To investigate the definitions of spirituality in the healthcare field, identifying its main dimensions and proposing a framework that operationalizes the understanding of this concept.

Methods: This is a systematic review following the PRISMA guideline (PROSPERO: CRD42021262091), searching for spirituality definitions published in scientific journals. Searches were carried out in PubMed (all articles listed up to October 2020) and in the reference lists of the articles found in the database, followed by selection under specific eligibility criteria.

Results: From a total of 493 articles, 166 were included in the final analysis, showing that there is a large body of scientific literature proposing and analyzing spirituality definitions. In these articles, 24 spirituality dimensions were found, most commonly related to the connectedness and meaning of life. Spirituality was presented as a human and individual aspect. These findings led us to construct a framework that represents spirituality as a quantifiable construct.

Conclusions: Understanding spirituality is an important aspect for healthcare research and clinical practice. This proposed framework may help to better understand the complexity of this topic, where advances are desirable, given the relevance it has acquired for integral health care.

Keywords: spirituality, religion, religion and psychology, religion and medicine, healthcare

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INTRODUCTION

Spirituality is a broad and complex concept which varies its understanding according to different cultural, religious and academic backgrounds (i.e., religious persons, scientists, or lay persons; Koenig, 2008; la Cour and Götke, 2012). In this context, there is a remarkable debate regarding the most accurate meaning, and regarding the possibility of having a single universal consensual definition for this concept (Peng-Keller, 2019). Some issues arise since the fact that spirituality is often linked and overlaps another important concepts, such as religion/religiosity and well-being/positive emotions (Hill et al., 2000).

Historically, the term spirituality was used to describe the practices of people who dedicated their lives into religious services or exemplify the teachings of their faith traditions (Koenig, 2008). Only in the last decades, spirituality has been detached from religiosity as a distinct construct, even though the scientific community still refers to this research field using the "dual" term religiosity/spirituality (R/S; Zinnbauer et al., 1997; Bauer and Johnson, 2019).

Research over the last decades has been growing substantially in the field of "Spirituality and Health," showing a significant influence of spiritual and religious beliefs on both mental and physical health outcomes (Damiano et al., 2016), and approximately 30,000 articles have been published in this field of research from 1999 to 2013 in the PubMed database (Lucchetti and Lucchetti, 2014). In addition, the spiritual dimension has been proposed to be included in the multidimensional concept of "health," as illustrated by discussions in the scope of the World Health Organization (WHO), which referred to the "*inclusion of a non-material or spiritual health dimension, making the concept come to be regarded as a dynamic health state - physical, mental, spiritual and social behavior*" (Grad, 2002; Dhar et al., 2011; Toniol, 2017).

This discussion is supported by a robust body of evidence suggesting a significant effect in physical, mental, and social health (Koenig, 2015; Zimmer et al., 2016; Mishra et al., 2017). Spirituality is generally related to diminished numbers of substance use, suicidal attempts and depression prevalence, less hospitalization, better coping with disease, better treatment adherence, and lower mortality rates (Moreira-Almeida et al., 2006; Guimarães and Avezum, 2007; Lucchetti et al., 2011). In addition to the clinical importance observed, patients want their doctors to address spirituality and most doctors and nurses consider important to integrate this aspect into their practice (Baetz et al., 2004). However, several barriers limit addressing R/S, including the lack of training by health professionals and the lack of clear defined concepts (Best et al., 2015; Menegatti-Chequini et al., 2019). In this context, the understanding of Spirituality becomes an important issue for research, clinical practice, and the training of health professionals (Lucchetti et al., 2012; Attard et al., 2019).

Despite the increasing use of the concept of spirituality among health researchers, there is no clear consensus about its definition (Chiu et al., 2004; Sessanna et al., 2007; Gall et al., 2011). This lack of standardized definition increases the potential for non-standardized constructs, creating pitfalls while comparing studies that use different criteria and instruments, especially in health-related researches. While for the social sciences there is no major concerns for the lack of an universal definition of spirituality, medical and health-related sciences need a structure and relative consensus, since most instruments attempt to quantify its intangible construct in order to evaluate its impact and propose health-related interventions (Macdonald and Friedman, 2002; Hill and Pargament, 2008).

Although a previous study has already used qualitative content analysis of the published literature (Elkins et al., 1988), in the last decades, the field of spirituality has considerably changed with a large number of publications and ongoing researches. Likewise, several articles were published with new definitions and concepts. Therefore, it is of urgent necessity to better clarify and disentangle the concepts of spirituality and religiosity, determining and understanding which dimensions of spirituality influence more positively health-related endpoints. In this sense, the present article aims to move forward on this discussion, presenting a systematic review of the spirituality concept for the healthcare field, identifying its main dimensions and proposing a framework that operationalizes the understanding of the term spirituality.

MATERIALS AND METHODS

This is a systematic review based on the PRISMA statement for reporting systematic reviews and meta-analyses (Page et al., 2021). The protocol was registered in the PROSPERO international prospective registry of systematic reviews (registration number: CRD42021262091).

Eligibility Criteria

The following criteria were applied to include the studies in this review: articles that addressed the meaning, concept, or definition of spirituality (either new proposals of definitions in the healthcare area or operational definitions that analyzed pre-existent definitions in the literature). All articles (letters to the editor, editorials, opinion essays, observational studies) were included. No language or date restrictions were applied. The exclusion criteria were articles that were not available in full, articles not related to the definition of spirituality, and those that did not present a new concept or operational definition about spirituality.

Search Strategy

The literature search was conducted using the PubMed database (all articles listed up to October 1, 2020), with the Boolean expression "*spirituality [title] AND (concept OR definition)*" and scanning reference lists of the included articles.

Study Selection

The selection of studies was conducted in three stages:

Stage 1: All references on the PubMed database were screened using the Boolean expression described above; additional records were identified through the list of references of the articles obtained. Duplicates were excluded using the Endnote software. Eligibility was determined based on title and/or abstract. Articles that brought a new proposal of spirituality definition or analysis of definitions already existing were considered and included. All included articles on stage 1 proceeded to stage 2.

Stage 2: The articles were read in full, focusing on the eligibility criteria and on evaluating the characteristics of the article (authors, year of publication, number of citations, language) and of the definition (discursive or in topics, newly proposed, operational definition or citation). Articles that only cited pre-existing definitions were excluded, but their lists of references were used as a secondary source.

Stage 3: All definitions of spirituality found were analyzed, seeking to identify the dimensions they presented.

Data Extraction and Analysis

All definitions of spirituality were analyzed looking for expressions or terms that could characterize a dimension. The conceptual dimensions were identified using expressions or terms that were repeated and/or carried a similar meaning among the different definitions, for example: the expressions "these dimensions of spirituality are applicable to all human beings" and "spirituality refers to a fundamental aspect of humanity" are part of different definitions of spirituality and have been classified as the "human dimension" simply (Anandarajah, 2008; Appleby et al., 2018). After identifying all dimensions, from all selected definitions, a second author looked up into each definition in order to confirm and unify all chosen dimensions. In this step, a score was established to quantify the use of a given term/expression, with each use corresponding to one point. The sum of the number of points was transformed into percentage, with 166 corresponding to 100%, since 166 was the total number of definitions analyzed. Terms that did not appear in at least 3 definitions were excluded, as they corresponded to less than 2% appearance in the definitions.

Framework Development

The results led us to construct a framework, organizing the correlated dimensions in horizontal axes, representing spirituality in a visual structure (see the "Discussion" section below).

RESULTS

Study Selection and Characteristics

We found 441 articles in the PubMed query and 54 additional records were identified in secondary sources. After excluding duplicates, a total of 493 articles remained for the first screening. From them, 277 were accepted for full text reading. After full text reading, 111 articles were excluded, leaving a total of 166 articles, most of which in English, that were included in final analysis concerning spirituality definitions. **Figure 1** summarizes the steps of the systematic review. **Tables 1** and **2** presents, respectively, the most cited articles and books on November 3, 2020, according to Web of Science and Google Scholar.

With the above-mentioned procedures, 24 spirituality dimensions were found (**Table 3**). The dimensions were recognized from the identification of terms or expressions that were common to at least three different spirituality definitions, for example, terms such as "connection," "God," and "life after death." A score was made to analyze how often a term appeared. All definitions used can be found in **Supplementary Material**.

Synthesized Findings

Most of the publications considered spirituality as a "connection" or "relation" (53.01%), which provides (or is the search for) purpose, meaning or reason for being (51.80%). Our results also found that the sense of spirituality connection occurs in relation to the Divine, God, or Higher Power (39.75%), in relation to something transcendent (38.55%), in relation to other people (37.95%), through self-connection (25.90%), and/or with nature (24.09%). In a less relevant way, there are connections with the sacred (12.04%), with an immanent aspect (5.42%), with spiritual/supernatural beings (3.01%), and through art (1.80%).

Three important dimensions were also found and can function as axes of spirituality: beliefs or faith (29.51%), experiences (19.87%), and practices or behaviors (18.67%). Furthermore, spirituality was presented as an intrinsically human characteristic (13.85%), as a subjective, individual, and particular aspect (19.87%), and as a dynamic process (4.81%). It could be felt as a power or inner energy (13.85%), as an element that sustains (5.42%), or it could be felt as a necessity to achieve (3.61%). It can also be understood as a life after death belief and attribute (1.80%). Finally, spirituality was related to the development of peace and well-being feelings (15.06%), values (23.49%), and personal growth (10%).

DISCUSSION

To our knowledge, this is the first study that systematically evaluated the most important and highly cited spirituality definitions under the healthcare field, instead of focusing on one specific area such as nursing or palliative care. We found a large body of scientific literature proposing and analyzing definitions of spirituality. If, on the one hand, this amount of articles shows the great interest concerning the association between spirituality aspects and healthcare, on the other hand, it shows that this is a controversial and challenging issue for the academic field, revealing a clear lack of consensus on the understanding of what spirituality is (George et al., 2000; Speck, 2005).

The most cited reference from an article included in our review comes from Hill and Pargament (2003), which states that "*spirituality can be understood as a search for the sacred, a process through which people seek to discover, hold on to, and, when necessary, transform whatever they hold sacred in their lives*" (Hill and Pargament, 2003). Among the books, the most cited reference comes from Koenig et al. (2001), "*Spirituality is the personal quest for understanding answers to ultimate questions about life, about meaning, and about relationship to the sacred or transcendent, which may (or may not) lead to or arise from the development of religious rituals and the formation of community*" (Koenig et al., 2001).

We discuss below the most important spirituality dimensions ("connection," "interpretation of life," "beliefs, practices and experiences," "spirituality sensations", and "spirituality as an intrinsic component of human beings") found in these studies. Based on this theoretical background, we propose the organization of a framework that can be used for clinical practice, training of healthcare professionals and future research.

Connection: Narrower or Broader

Connection (or relationship) could be considered as a central aspect of spirituality, as found in 88 definitions (53.01%). Broader definitions tend to consider spirituality as experiences of connection with nature, social relations, and art, while

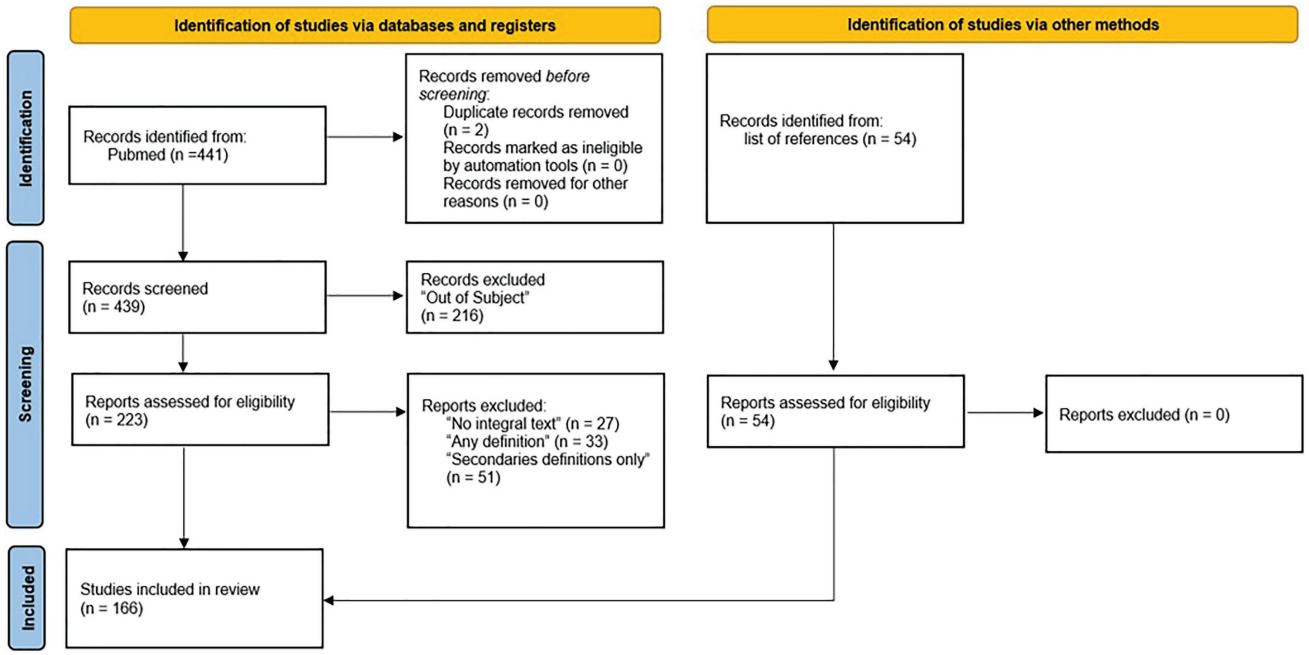

FIGURE 1 | PRISMA search strategy used in the present study.

narrower definitions place spirituality in a more theistic approach (i.e., related to the Divine, God, a Higher Power, or the Transcendent). Analyzing this dimension, we can identify an overlapping of spiritual and religious meanings.

It can be observed, for example, in the definition of spirituality proposed by Bergamo and White (2016), "*(…) Most spiritual affiliations relate to surrendering personal control, searching for a larger life meaning, and recognizing a higher or transcendent power. Spirituality may also refer to more generalized feelings of connectedness with others or strong personal values that may assist individuals with finding peace and contentment in their lives. Spirituality is broad in definition as it may range from beliefs and connectedness to organized religion or may be based on more generalized personal values*" (Bergamo and White, 2016).

Historically, the understanding of spirituality was linked to the expression of religiosity. Religiosity can be described as the way an individual follows and experiences or practices a given religion, whether intrinsically or extrinsically, following an organizational and/or non-organizational standard (Allport and Ross, 1967; Koenig and Büssing, 2010). The term spirituality was used to designate the religious traditions of the East, upon the colonial encounters, and also it was apparently used within the Catholicism of the seventeenth century in a negative context, to describe subjective forms of religious practice (Wolfteich, 2005; Van Der Veer, 2008).

However, in the last decades, the distinction between spirituality and religiosity has been gaining more representativeness associated with the "new age" movement, which brought the approach of spirituality unrelated to religion, with the increase in the number of people who declare themselves atheist and "*spiritual but not religious*," a group identified by Zinnbauer et al. (1997), Koenig (2008) and Zimmer et al. (2016) which can be understood as composed by individuals with a comprehensive spirituality connection, presenting a rather personal nature of spirituality (Marshall and Olson, 2018; Wixwat and Saucier, 2021).

Following this point of view, it is possible to note that for some authors, spirituality has been considered as something broader, which may involve religiosity, but goes beyond it (Jones et al., 2011). From our results, we recognize that spirituality and religiosity are related and overlapping, varying according to the cultural context and to the dynamic quality of the spirituality itself.

Understanding this relation may prevent a dualism in the understanding of spirituality, as something good, and religion, as something bad, noting instead that both can have positive and negative aspects in their expression (Hill et al., 2000). In addition, this overlapping supports that religious traditions should be understood by health professionals, particularly in clinical practice and in the training of health professionals (Puchalski and Larson, 1998).

Interpretation of Life: Meaning and Purpose

Spirituality can be considered a source of coping to handle crisis and stressful moments, and related to positive meanings in face of challenges, such as in health problems. This process is related to improving patients' outcomes, manages chronic pain, or deals with a diagnostic as cancer (Breitbart, 2002; Vachon, 2008; Dedeli and Kaptan, 2013; Weber and Pargament, 2014; Bernard et al., 2017).

For Reed (1992), based on the investigation of spirituality in nursing, "*Spirituality refers to the propensity to make meaning*

TABLE 1 | Most cited articles, according to Web of Science and Google Scholar Citations in November 3, 2020, found in the present study.

Ranking	Article	Year	No. Wos citations	No. Google Scholar citations
1	Hill, P. C., Pargament KI. Advances in the conceptualization and measurement of religion and spirituality. Implications for physical and mental health research. Am. Psychol. 2003 Jan;58(1):64–74. doi: 10.1037/0003-066x.58.1.64. PMID: 12674819.	2003	1,129	3,208
2	Puchalski C, Ferrell B, Virani R, Otis-Green S, Baird P, Bull J, Chochinov H, Handzo G, Nelson-Becker H, Prince-Paul M, Pugliese K, Sulmasy D. Improving the quality of spiritual care as a dimension of palliative care: the report of the Consensus Conference. J Palliat Med. 2009 Oct;12(10):885–904. doi: 10.1089/jpm.2009.0142. PMID: 19807235.	2009	574	1,187
3	Anandarajah G, Hight E. Spirituality and medical practice: using the HOPE questions as a practical tool for spiritual assessment. Am Fam Physician. 2001 Jan 1;63(1):81–9. PMID: 11195773.	2001	288	870
4	Tanyi RA. Towards clarification of the meaning of spirituality. J Adv Nurs. 2002 Sep;39(5):500–9. doi: 10.1046/j.1365-2648.2002.02315.x. PMID: 12175360.	2002	274	845
5	Reed PG. Spirituality and well-being in terminally ill hospitalized adults. Res Nurs Health. 1987 Oct;10(5):335–44. doi: 10.1002/nur.4770100507. PMID: 3671781.	1987	236	718
6	Breitbart W. Spirituality and meaning in supportive care: spirituality- and meaning-centered group psychotherapy interventions in advanced cancer. Support Care Cancer. 2002 May;10(4):272–80. doi: 10.1007/s005200100289. Epub 2001 Aug 28. PMID: 12029426.	2002	220	561
7	Reed PG. An emerging paradigm for the investigation of spirituality in nursing. Res Nurs Health. 1992 Oct;15(5):349–57. doi: 10.1002/nur.4770150505. PMID: 1529119.	1992	198	614
8	Dyson J, Cobb M, Forman D. The meaning of spirituality: a literature review. J Adv Nurs. 1997 Dec;26(6):1183–8. PMID: 9429969.	1997	166	562
9	Chiu L, Emblen JD, Van Hofwegen L, Sawatzky R, Meyerhoff H. An integrative review of the concept of spirituality in the health sciences. West J Nurs Res. 2004 Jun;26(4):405–28. doi: 10.1177/0193945904263411. PMID: 15155026.	2004	142	370
10	Cook CC. Addiction and spirituality. Addiction. 2004 May;99(5):539–51. doi: 10.1111/j.1360-0443.2004.00715.x. Erratum in: Addiction. 2006 May;101(5):761. PMID: 15078228.	2004	118	399
11	McSherry W, Cash K. The language of spirituality: an emerging taxonomy. Int J Nurs Stud. 2004 Feb;41(2):151–61. doi: 10.1016/s0020-7,489(03)00114-7. PMID: 14725779.	2004	104	277
12	Martsolf DS, Mickley JR. The concept of spirituality in nursing theories: differing world-views and extent of focus. J Adv Nurs. 1998 Feb;27(2):294–303. doi: 10.1046/j.1365-2648.1998.00519.x. PMID: 9515639.	1998	102	331
13	Worthington EL Jr, Hook JN, Davis DE, McDaniel, M. A. Religion and spirituality. J Clin Psychol. 2011 Feb;67(2):204–14. doi: 10.1002/jclp.20760. PMID: 21108313.	2011	101	343
14	McSherry W, Cash K, Ross L. Meaning of spirituality: implications for nursing practice. J Clin Nurs. 2004 Nov;13(8):934–41. doi: 10.1111/j.1365-2702.2004.01006.x. PMID: 15533099.	2004	98	275
15	Newlin K, Knafl K, Melkus GD. African-American spirituality: a concept analysis. ANS Adv Nurs Sci. 2002 Dec;25(2):57–70. doi: 10.1097/00012272-200212000-00005. PMID: 12484641.	2002	93	291

TABLE 2 | Most cited books, according to Google Scholar citations in November 3, 2020, found in the present study.

Ranking	Book	Year	No. Google Scholar citations
1	Koenig, H. G., McCullough, M., & Larson, D. B. (2001). Handbook of religion and health. New York: Oxford University Press.	2001	7,245
2	Koenig H. G., King D. & Carson V. (2012). Handbook of Religion and Health. Oxford University Press, New York.	2012	7,245
3	Stoll R. I. (1989). The essence of spirituality. In: Carson V. B, ed. Spiritual Dimensions of Nursing Practice. Philadelphia: Saunders.	1989	388
4	Koenig, H. G. (2005). Faith and mental health: Religious resources for healing (p. 44). Philadelphia and London: Templeton Foundation Press.	2005	300
5	Solomon R. (2002). Spirituality for the skeptic: The thoughtful love of life. New York: Oxford Univ. Press.	2002	233
6	O'Brien, M. E. (1982). The need for spiritual integrity. In H. Yura & M. B. Walsh (Eds.), Human needs and the nursing process (pp. 85–115). Norwalk, CT: Appleton- Century-Crofts.	1982	66
7	Colliton, M. A. (1981). The spiritual dimension of nursing. In I. L. Beland & J. Y. Passes (eds.), Clinical Nursing (4th ed.) (pp. 492–501) New York, NY: Macmillan.	1981	61
8	Renetzky L. (1979) The fourth dimension: applications to the social services. In: Moberg D, ed. Spiritual Well Being. University Press of America, Washington: 215–28	1979	30
9	Walsh, R. (1999). Essential spirituality. The 7 Central Practices to Awaken Heart and Mind. New York: John Wiley	1999	22
10	Surbone, A., Konishi, T., & Baider, L. (2011). Spiritual issues in supportive cancer care. In I. N. Oliver (Ed.), The MASCC textbook of cancer supportive care (pp. 419–425). New York, NY: Springer	2011	3
11	Smeltzer, S., Bare, B., (1996). Brunner and Suddarth's Textbook of Medical–Surgical Nursing. Lippincott Raven Publishers, Philadelphia, PA.	1996	3

TABLE 3 | Spirituality dimensions.

Connection/Relation	53001%
Meaning/purpose	51.80%
Divine/god/higher power	39.75%
Transcendence/immaterial	38.55%
Others/community relationship	37.95%
Beliefs	29.51%
Self connection	25.90%
Nature connection	24.09%
Values	23.49%
Individual/personal	19.87%
Experience	19.87%
Practices/behaviors	18.67%
Peace/well-being	15.06%
Human aspect	13.85%
Power, force, inner energy	13.85%
Sacred	12.04%
Personal growth	10%
Immanence	5.42%
Support/sustain element	5.42%
Dynamic process	4.81%
Necessity	3.61%
Spiritual beings	3.01%
Art connection	1.80%
Life after death	1.80%

through a sense of relatedness to dimensions that transcend the self in such a way that empowers and does not devalue the individual"(Reed, 1992). Other concepts, such as those from Koenig et al. (2001) and Puchalski et al. (2014), also highlight "meaning" as an important aspect of spirituality.

"Meaning" as a dimension of spirituality may exist in religious or non-religious individuals, pointing to an universal characteristic that can be used to assess the patient's spirituality, as proposed in some assessment tools as the HOPE questions and FICA questionnaire (Anandarajah and Hight, 2001; Breitbart, 2002; Puchalski and Romer, 2005).

Beliefs, Practices, and Experiences

Three important spirituality aspects were found in our search – beliefs, practices, and experiences – in agreement with the proposition of Anandarajah and Hight (2001), the third most cited article:

"*Spirituality is a complex and multidimensional part of the human experience. It has cognitive, experiential and behavior aspects. The cognitive or philosophic aspects include the search for meaning, purpose and truth in life and the beliefs and values by which an individual lives. The experiential and emotional aspects involve feelings of hope, love, connection, inner peace, comfort, and support. These are reflected in the quality of an individual's inner resources, the ability to give and receive spiritual love and the types of relationships and connections that exist with self, the community, the environment and nature, and the transcendent* (e.g., *power greater than self, a value system, God, cosmic consciousness*). *The behavior aspects of spirituality involve the way a person externally manifests individual spiritual beliefs and inner spiritual state*" (Anandarajah and Hight, 2001).

Beliefs can be considered as the cognitive dimension of spirituality, an affirmation of something considered real, which varies according to the culture. Some religious/spiritual beliefs are, for example,

the existence of a higher, transcendent power or the continuity of life after death. The belief of spirituality involving the existence beyond the death of the body could be found in studies with specific population, e.g., African–American women and Muslims (Banks-Wallace and Parks, 2004; Markani et al., 2013).

Practices correspond to the dimension of behavior, being social or individual, public or private, that requires the engagement of the individual to perform activities such as meditating, praying, or going to meetings of the group that shares his/her spiritual/religious beliefs.

The experiences compose the subjective aspect, based on the individual perception of the presence of elements of interaction with the connecting object of spirituality, going beyond the bond through the intellect.

These three components form a range that can be encouraged by the health professional when associated with health benefits, inviting the professional to a broader investigation on the relationship between health, spirituality, and the patient.

Spirituality Sensations

Some spirituality definitions bring the description of feelings resulting from the spiritual connection experienced, such as in Tanyi (2002), one of the most cited articles:

"*(…) This connection brings faith, hope, peace, and empowerment. The results are joy, forgiveness of oneself and others, awareness and acceptance of hardship and mortality, a heightened sense of physical and emotional well-being, and the ability to transcend beyond the infirmities of existence*" (Tanyi, 2002).

Definitions based on concepts like peace, well-being, and quality of life tend to have a tautological problem, because these positive emotions cannot be distinguished from some measures of mental health (Koenig, 2008). On the other hand, it could be a way to identify whether negative spirituality exists, for example, if cases of "spiritual and religious problems" (DSM V - code 62.89) and "spiritual emergency" could be considered a negative aspect of spirituality because they are not associated with good feelings, values, and personal grow (Lukoff et al., 1998; Prusak, 2016).

Spirituality as an Intrinsic Component of Human Beings

Puchalski et al. (2014) begin a spirituality definition from an international consensus as "*Spirituality is a dynamic and intrinsic aspect of humanity (…)*." Understanding spirituality as a human characteristic could refer to ancient traditions of healthcare, such as Traditional Chinese Medicine and Ayurvedic Medicine (the traditional Indian medicine), which describe the human being as having also a spiritual component that was taken into account both to identify the cause of diseases and in their therapeutic approaches (Narayanasamy and Narayanasamy, 2006; Gureje et al., 2015; Mou, 2017; Teixeira, 2017). The approximation of conventional medicine to this point of view can be observed through the Integrative Medicine practices (Hu et al., 2015).

Even though spirituality can be understood as a characteristic common to all humans, it is a particular expression of each one. Individuality as a dimension of spirituality emphasizes the importance of looking at each person and their subjective experience, pointing to the person-centered care whose goal is a meaningful life, which is an important interception between health care and spirituality (Puchalski, 2013; Håkansson Eklund et al., 2019). The healthcare professionals should be capacitated in recognizing spiritual issues in their patients and facilitate connections with the appropriate support (Fitch and Bartlett, 2019).

Spirituality as an inner energy, a power or a force reminds us of the etymological origins of the word, its roots in the Latin "*spiritus*," which roughly translates as "breath of life," also "what animates," "what gives life, existence." A similar notion was carried by the terms "*ruah*," in Hebrew, and "*pneuma*," in Greek. It is interesting to note that these terms were traditionally used in a religious context for these societies (Cambridge International Dictionary of English, 1995; Longman Dictionary of Contemporary English, 2014; Withers et al., 2017).

PROPOSED FRAMEWORK FOR SPIRITUALITY IN HEALTHCARE

Based on the present systematic review, our findings allowed us to develop a framework for spirituality in healthcare, which will be discussed below.

The definitions of spirituality are multifactorial, including religious heritage, culture, generation, and nationality (Gall et al., 2011). Spirituality identified as a plural construct in a visual structure organization can guarantee an understanding of the complexity of this phenomenon. Based on learning theories, when content is exposed interconnecting the verbal and the visual, it facilitates the construction of connections, relationships, and understanding in the cognitive structure (Peer et al., 2021).

Spirituality can be analyzed through multiple dimensions, which identification may clarify how individuals interact with their spirituality, and which aspects greater impact more on health and treatment (Lunder et al., 2011; MacDonald et al., 2015). In this way, models of frameworks have been proposed in the literature, using relevant axes and constructs.

For example, McSherry et al. (2004) proposed a "Taxonomy of Spirituality" describing a spectrum of two ends: in one extreme, there is a spirituality based on religious and theist ideals, while at the other extreme there is a spirituality based upon secular, humanistic, and existential elements. A middle way is explained containing elements from both ends, but not as fundamental or radical. The elements are: theistic; religious affiliation; language; cultural, political and social ideologies; phenomenological; existential; quality of life and mystical. In another framework, Ko et al. (2017) propose that spirituality consists of two dimensions (i.e., vertical and horizontal) and eight attributes, considering which antecedents can lead to such dimension of spirituality and what are the consequences of it. In the horizontal dimension, the attributes are regarding connectedness with yourself or other people; in the vertical dimension, hierarchical, the connection is with God and about having a holy life (McSherry and Cash, 2004; Ko et al., 2017). Although there are some frameworks proposals on the concept of spirituality as seen above, there are still many aspects of

this concept that remain unaddressed, indicating the need for a new, more comprehensive approach that may fit into the diverse cultural and religious contexts discussed in this research.

We present a spirituality framework proposition (**Figure 2**) that organizes all the dimensions found, except "human aspect," "individual aspect," "dynamic process," and "necessity" because they can be understood as dimensions about the general spirituality nature, permeating all axes and cannot be dissociated and allocated to a single axis or dimension. The framework was designed as a didactic scheme, presenting the dimensions as a non-hierarchical and non-static construction, which flow according to individual's context and experiences.

The representation of the dimensions of spirituality was divided into three axes/domains. The first axis (upper white section) is composed of beliefs, practices, and experiences that promote connection. It can be understood as a spirituality starter point. These aspects are assessed by some validated instruments as Spiritual Involvement and Beliefs Scale (SIBS) and Spiritual Well-Being Scale (SWBS; Hyman and Handal, 2006).

In the second axis (middle dark gray section) are the possible aspects that can be connected through spiritual beliefs, practices, or experiences. They are classified as:

- *Sacred* – something that cannot be described in ordinary, profane terms. Something can be considered sacred through a manifestation, a revelation to the individual or his/her religious/spiritual group, such as an object or symbol that reveals something of a unique nature to the person who contemplates it (Eliade, 2018).
- *Life after death* – related to the incorporeal, immaterial, and immortal portions present in the individual that survive in another realm after the body death. This beliefs in the immortality of the soul, in the existence of a spiritual dimension considering an extra-physical place, are found in some religions as Catholicism, Judaism, Hinduism and Buddhism (Siegel, 1980).
- *Spiritual beings* – related to the contact or influence of immaterial beings, even ancestors, that can connect to the material world through a paranormal sensitivity or anomalous experiences (Banks-Wallace and Parks, 2004; Martins and Zangari, 2012). Similar terms: Spirits, Ghosts, Supernatural presences.
- *Divine, God* – refers to the belief of one or more gods, beings of ultimate power connected to the celestial world, as a spirituality vertical dimension. Associated with religious context (Ko et al., 2017).
- *Self* – relates to the connection with oneself, the body, and the individual's inner resources (Anandarajah and Hight, 2001).
- *Community* – aspects related to the ability to feel significative connection with other persons in the community, their neighbors, or family. This kind of connection could be understood as the social factor of the spirituality (Kao et al., 2020).
- *Nature* – understand the immanent nature as a mean of expression of the sacred. Already present in some aboriginal cultures, Celtic and Folk religions which respect all the nature as a living being. Also called "Ecospirituality" (Effa, 2017).
- *Art* – contemplate or develop an artwork (painting, sculpture, music, dance, literature, architecture) is an aesthetic experience that can stimulate the individual's sensitive aspect leading him/her to the state of awe and/or to the perception of transcendence. The art can be seen in some spiritual cultures and religious rituals, for example, Buddhist sand mandalas and songs used in cults (Mooney and Timmins, 2007; Jones et al., 2019).

The third axis (lower gray section) refers to the development of values, personal growth, and sensations of meaning, purpose in life, well-being, support, and inner peace through connection with something that can affect the behavior of the individual. This perception is a concern for some religious faiths, to enhance this feeling that can be called "spiritual well-being" (Moberg, 1984).

We believe that the identification of these dimensions can help researchers and health professionals to map how individuals understand and express their spirituality, making it operational.

LIMITATIONS

Several limitations can be identified in the present study. First, we only included one database and, for this reason, articles indexed only in other databases were not included; PubMed was chosen because this is a medical database and the definitions of spirituality included in these articles were more likely to be related to healthcare. Second, we used a narrow Boolean search that could impair a broader contextualization of the field. Although other terms such as "meaning" or "understanding" could have been used, they would result in a great number of unrelated references, since there are several articles assessing meaning of life or understanding the mechanisms for the relationship between R/S and health outcomes. Therefore, in order to focus our search on articles specifically providing a definition or concept, we chose to limit the terms used in the review. Third, there is a low multicultural representativeness because most of the articles were from the United States, in English, showing a possible bias of an Anglo-Saxon, Western, and Judeo-Christian culture, which may have impacted the definitions presented in the articles. Forth, although English is the main language in the scientific literature, the constructs of this framework need to be made for other languages that have large worldwide representation, since the contents described here may not apply to the linguistic variety in countries like India and China, for example. Further research is needed to explore the language issue in different population samples. Fifth, this framework is herein newly proposed, and thus, it still lacks a validation by other studies. Sixth, the credibility of the included references was assessed by authors reading the full text of each article, as well as assessing the usual scientometric parameters, i.e., number of citations, which could be considered another limitation. Particularly in this field of knowledge, theoretical and conceptual articles have limited space in high impact journals, and citations could be a good approach to see the impact of the definition/concept in the field. Another important point is that funders role on the

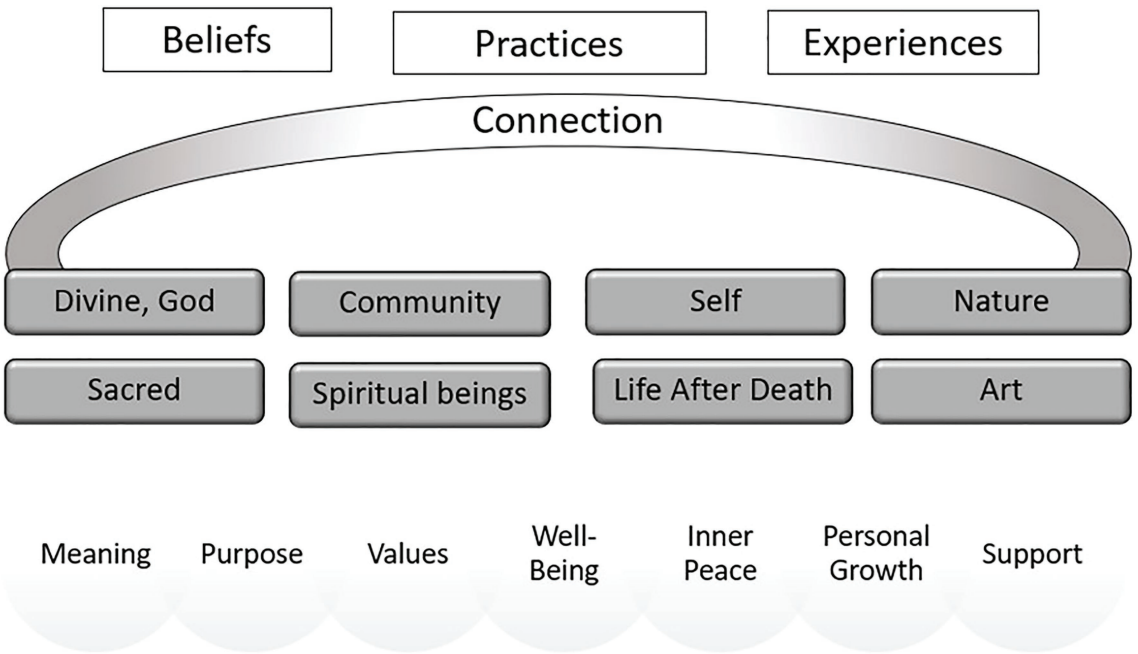

FIGURE 2 | Spirituality framework proposition.

manuscripts was not evaluated, posing risks of bias for the adopted definitions of each article. Seventh, we gave insufficient consideration to the manner in which the definitions of spirituality were developed (e.g., conceptual versus empirical approaches to definition and measurement) and it should be considered in further research.

CONCLUSION

The tendency to expand the concept of health to embrace what is called spirituality gains strength with the academic evidence that relates health and spirituality. However, due to the lack of consensus on the term and the existing cultural gaps, we propose a new spirituality framework, based on a systematic review of the literature, in which spirituality (1) is a human individual, dynamic characteristic; (2) is expressed through beliefs, practices, and experiences in the search for connection with something that promotes meaning and personal growth; and (3) leads to the development of values and positive inner feelings.

Based on this, we aim to contribute to this field of knowledge, recognizing the areas of spirituality related to healthcare and the way in which it occurs, as well as to help in the classification and development of measurement instruments, thus creating an index for comparison of sample groups. The framework is intended to aid researchers in better characterizing what they mean by "spirituality," so a clearer and less prone to interpretations use of the term can take place in the scientific literature. In this sense, what we herein propose is a common ground where elements of different components of spirituality, which are not usually associated, can be understood in a coherent scenario, helping researchers to better design and comprehend their findings, as well readers to build a common ground of knowledge.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/**Supplementary Material**, further inquiries can be directed to the corresponding author.

AUTHOR CONTRIBUTIONS

MS and MP conceived of the presented idea. MS and RD collected the data and wrote the manuscript with support from GL and MP. GL aided in interpreting the results and edited the language. MP supervised the project. All authors contributed to the article and approved the submitted version.

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SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: https://www.frontiersin.org/articles/10.3389/fpsyg.2021.756080/full#supplementary-material

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Spirituality/Religiosity as a Therapeutic Resource in Clinical Practice: Conception of Undergraduate Medical Students of the Paulista School of Medicine (*Escola Paulista de Medicina*) - Federal University of São Paulo (*Universidade Federal de São Paulo*)

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Introduction: The high degree of religious/spiritual involvement that brings meaning and purpose to a patients' life, especially when they are weakened by pain, is among the various reasons to consider the spiritual dimension in clinical practice. This involvement may influence medical decisions and, therefore, should be identified in the medical history of a patient (anamnesis).

Objective: To verify the opinion of undergraduate medical students of the Paulista School of Medicine – Federal University of São Paulo regarding the use of a patient's Spirituality/Religiosity as a therapeutic resource in clinical practice.

Method: Quantitative approach of the transversal analytical observational type. The sample was composed of academics' medical program, from the first to the sixth year, regularly enrolled in 2017. Data collection was performed with a standardized questionnaire divided into three sections: sociodemographic profile; Duke University Religious Index; Spirituality/Religiosity in the clinical and academic context.

Results: Participated in the survey 72% of the enrolled students, of which 61.4% had religious affiliation, 26.2% declared themselves agnostic and 12.4% atheists. All of them proposed to answer questions about the insertion of Spirituality/Religiosity in the patient care process. Through the Duke Religiosity Index, we evaluated the importance of religiosity in the student's personal life and the pertinence of religiosity as a therapeutic insertion for medical treatment. Regarding the clinical and academic context, most participants considered relevant the proposition of didactic-pedagogical actions in medical education related to the spiritual dimension of the patient.

Conclusion: We conclude, through our research, that the insertion of the Spirituality/Religiosity of the patient as a therapeutic resource in clinical practice is feasible for most undergraduate students in Medicine of the Escola Paulista de Medicina – Universidade Federal de São Paulo (Paulista School of Medicine - Federal University of São Paulo). The result of the research, although it shows only the opinion of medical students at a Brazilian university, indicates that Spirituality/Religiosity is already part of the contemporary medical universe.

Keywords: spirituality, religiosity, medical education, clinical practice, undergraduate medical students

INTRODUCTION

This study involves the "triad": Religiosity, Spirituality, and Health. To better understand the concept of Religiosity, we will define Religion as an organized system of beliefs, practices, rituals, and symbols designated to facilitate access to the sacred and the transcendent (God, Greater Force, and Supreme Truth.). Religiosity, thus, corresponds to how much an individual believes, follows, and practices a religion (Koenig et al., 2001).

The first challenge was to seek a consensual definition of Spirituality in the scientific literature of health. There are several definitions, some totally dissociated from the meaning of Religiosity, and others that are intertwined with it. According to Koenig et al. (2001), Spirituality can be conceptualized as a personal quest to understand issues related to the purpose of life, its meaning, as well as relations with the sacred or transcendent that may or may not lead to the development of religious practices or formation of religious communities. Koenig (2012b) does not conceive a definition of Spirituality that is totally distanced from the "sacred or transcendent," but states that, because Spirituality is an aspect of human experience, the use of a broader definition, such as those presented by Association of American Medical Colleges [AAMC] (1998), Anandarajah and Hight (2001), and Puchalski et al. (2009) makes sense in clinical practice.

Puchalski et al. (2009) evidence this scope when they define Spirituality as an aspect of humanity that deals with the way individuals seek and express meaning and purpose, as well as with the way in which they express their connection with the moment, with oneself, with others, with nature, and with the sacred. According to Avezum and Esporcatte (2019), regardless of their belief, every human being has at least one form of Spirituality based on existential philosophy, finding meaning, purpose and fulfillment in life.

Medicine is not a reference area for the academic study of religions but provides intertextuality and interdisciplinarity with the Study of Religions, Anthropology and Sociology.

According to Crawford (2005), for scientists of religion, there is no universally accepted definition of religion due to the wide variety of existing theories. The English philosopher of religion and theologian, John Hick, states that religion has a different conception for the various areas of knowledge, such as anthropology, sociology, psychology, philosophy, and for different religious traditions. We conclude that, for scientists of religion, not only Spirituality, but also Religion and Religiosity do not have a definition of consensus.

Anthropologist Clifford Geertz defines religion as a system of symbols that acts to "establish powerful, penetrating and lasting dispositions and motivations in men by formulating concepts of a general order of existence and wearing these conceptions with such an aura of factually that the dispositions and motivations seem singularly realistic" (Geertz, 1989, p. 67).

Émile Durkheim, a 19th-century French psychologist, philosopher, and sociologist, analyzes religion from the perspective of a *collective consciousness*. It presents in its functionalist theory, religion as a cultural/social subsystem, which has a conciliatory and unifying function in moments of existential crises that are lodged within society (Durkheim, 2014).

Regarding the concept of Health, the World Health Organization (WHO) presents the following definition: "Health is a state of complete physical, mental and social well-being and not merely the absence of disease or infirmity" (World Health Organization [WHO], 1946). The biomedical paradigm gave way to the biopsychosocial paradigm. Historically, Science and Religion have always walked together, from antiquity to the Renaissance. The rupture was solidified with the advent of the Enlightenment and the French Revolution (Moreira-Almeida, 2009; Numbers, 2009a,b). A tentative rapprochement between religion and medicine took place in 1910, with the publication of an article by Johns Hopkins University Professor of Medicine, Sir William Osler, with reflections on the healing powers of faith, where he advised that a clinician needs to be attentive to faith, this powerful force present in patients (Osler, 1910). In 1984, a movement of representatives from WHO member countries began to discuss and propose the inclusion of spiritual well-being in the concept of Health. However, the difficulty in finding a consensus in the conceptualization of Spirituality, due to cultural differences and religious traditions, impaired the discussion and led to the non-approval of the proposal (World Health Organization [WHO], 1999). Although spiritual well-being is not included in the definition of Health[1], in 2002, in a cross-cultural perspective, the WHO developed the SRPB Module *(Spirituality, Religion and Personal Beliefs)* for its Quality-of-Life Instrument to add the spiritual dimension as a domain. The WHOQOL-SRPB field test instrument has 32 questions, covering aspects of quality of life related to Spirituality, Religiosity, and Personal Beliefs (SRPB) and should be used in conjunction with the WHOQOL-100 (WHOQOL-SRPB, 2002).

[1]Available in: https://www.who.int/about/governance/constitution. Accessed: 28 Oct. 2021.

The Portuguese version and validation were produced by Panzini et al. (2011).

Because we recognize that the approach of a patient's Spirituality/Religiosity is extremely important in clinical practice and, at the same time, totally relegated, we decided to focus on this theme. We carried out research to identify the opinion of undergraduate medical students on the approach of a patient's spiritual dimension as a therapeutic resource in clinical practice. We also wanted to know if they were in favor of the proposal of didactic-pedagogical actions related to a patient's spiritual dimension in medical education (Borragini-Abuchaim, 2018).

We investigated the students' religious affiliation and Religiosity to know how much this aspect would influence their perception of the therapeutic use of a patient's Spirituality/Religiosity. We chose to apply the Duke University Religious Index (DUREL) (Koenig et al., 1997), a short and simple scale that provides relevant data (King and Koenig, 2009). The DUREL version in Portuguese was developed by Moreira-Almeida et al. (2008), and the validation was done by Lucchetti et al. (2012a) and Taunay et al. (2012), the latter verified that DUREL was reliable and valid for use in university populations.

Regarding the clinical context of the approach to the spiritual dimension of the patient, we verified in the literature that obtaining the spiritual history (spiritual anamnesis) does not happen effectively in the medical conduct[2]. It could be included, naturally, in the patient's medical history (anamnesis), shortly after the social/family history, preceding the clinical examination. It is important to emphasize that spiritual anamnesis should not be coercive (Koenig, 2012a)[3]. There is scientific evidence on the therapeutic efficacy of Spirituality/Religiosity on physical and mental health and quality of life, beneficial effects on a patient's adhering to treatment and positive interference in prognosis, improved doctor-patient relationship, and influence in medical decisions (Chibnall and Brooks, 2001; Peres et al., 2007; Lucchetti et al., 2010; Koenig, 2012a,b, 2015). Several studies have proven patients' predisposition to share their beliefs with their physician (Anandarajah and Hight, 2001; Puchalski, 2006; Koenig, 2012a,b; Saad et al., 2015). The simple taking of spiritual history makes the patient feel comfortable to make use of his religious/spiritual beliefs as an adjunct to the medical treatment (Koenig, 2012a,b). Moreover, religious/spiritual involvement brings meaning and purpose to the lives of most patients, especially when they are weakened by pain (Dal-Farra and Geremia, 2010; Moreira-Almeida et al., 2010; Koenig, 2012a,b; Lucchetti et al., 2012b). Pargament et al. (2001) report that some misinterpreted religious traditions can provoke *negative coping,* which happens on average with 15% of patients, who believe that God has stopped loving them, that they are being punished, that they have been abandoned, and feel deeply frightened. The authors state that the spiritual history will allow a physician to identify these patients' spiritual need and request the presence of a religious leader who can comfort them and get them out of this distressing situation. The broad search we carried out in the main databases on the subject generated a publication of our findings regarding the historical trajectory and the current state of the art from the perspective of Spirituality/Religiosity as therapy in patient care (Borragini-Abuchaim et al., 2019).

There is strong support in the literature suggesting that, with appropriate training in Spirituality/Religiosity, physicians are likely to perform spiritual anamnesis as a routine practice, since most of them are favorable to the approach. Training would also support the overcoming of obstacles that prevent the inclusion of the spiritual dimension in clinical practice, such as lack of time, lack of training or experience in taking a spiritual history, discomfort and insecurity in addressing the subject due to lack of knowledge, and fear of imposing one's own beliefs on the patient (Anandarajah and Hight, 2001; Monroe et al., 2003; Puchalski, 2006; Peres et al., 2007; Dal-Farra and Geremia, 2010; Lucchetti et al., 2010, 2012b; Koenig, 2012a,b; Saad and De Medeiros, 2012; Reginato et al., 2016; Puchalski et al., 2020). Puchalski et al. (2009) also draw attention to the benefit it would bring to physicians themselves since they would access their own Spirituality during the process. In 2020, we published these and other bibliographic findings related to the academic context of Spirituality/Religiosity (Borragini-Abuchaim et al., 2020).

Globalization and over-rationalism lead 21st century man to automatism and dehumanization, directing the being to melancholy and disenchantment with life itself. Spirituality regardless of any religious belief, when inserted in the medical curriculum can be used as another therapeutic resource in clinical practice. The purpose should not be the discussion of religious beliefs, but rather the instrumentalization of the student for conscious and efficient interventions in the approach and validation respectful of the spiritual dimension of the patient. It would also provide the student with a closer approach with the patient. As Reginato et al. (2016) state, students learn not to dehumanize themselves, but do not know how to act in the face of a lesser humanistic education. Upon graduation, the physician must be prepared to meet not only physical needs, but also the emotional, sociocultural, and spiritual needs that occur in the lives of patients, meeting the biopsychosocial and spiritual paradigm.

In Brazil, 85% of the population has some religious affiliation, which leads us to envision patient acceptance when seeing their Spirituality/Religiosity considered in clinical care. However, only 10.4% of Brazilian medical schools offer the discipline Spirituality/Religiosity in their curriculum. In this article we have already cited some of the various publications related to the benefits that the approach of the spiritual dimension brings to patients. However, little has been published about what medical students in Brazil think about the insertion of

[2]The taking of the patient's spiritual history, also called spiritual anamnesis, seeks to raise his belief: it brings comfort or generates stress; gives purpose and meaning to his life; helps in coping with diseases; has some restriction that affects treatment; enables you to be part of a spiritual community that supports you. For non-religious patients, one should ask what gives meaning and purpose to their life, how they live with the disease and what impact their cultural beliefs can cause on their treatment (Koenig, 2012a).

[3]The anamnesis (from greek, *ana* = bring again; *mnesis* = memory) involves the core of the doctor-patient relationship and guides the diagnostic and therapeutic plan. In summary, it is an interview that aims to bring back to the patient's mind all the facts related to the disease, signs and symptoms, through which it will be possible to trace a diagnostic hypothesis and establish an appropriate treatment approach (Santos et al., 2003; Soares et al., 2014).

Spirituality/Religiosity in clinical practice. By bringing spiritual anamnesis to the medical curriculum, we would provide students with a reflection on their own Spirituality/Religiosity. They would be prepared to deal with the pain and suffering of the patient providing a more humanized clinical care. These were the main reasons that leveraged the idealization of this research.

In this article, we will present the results obtained in the analysis of the questionnaire answered by medical students of the EPM/UNIFESP (from the first to the sixth year), Campus São Paulo, Brazil. The academic relevance of our research will be to present a general and quantitative overview about the insertion of "Spirituality/Religiosity in clinical practice" in the medical curriculum of the EPM. For the constitution of this purpose, we will investigate: (1) the importance that medical students of the EPM give to the spiritual dimension of the patient in clinical practice; (2) the credibility they give to the approach of the spiritual dimension of the patient as a therapeutic resource for the exercise of a more humanized clinical practice; (3) distancing from the patient's suffering; (4) the agreement of the insertion of didactic-pedagogical actions in medical education related to the spiritual dimension of the patient. Do the religious affiliation and religiosity of the medical student interfere in their position? Is there a difference between the year of graduation in which the student is and his/her agreement to the propositions?

MATERIALS AND METHODS

Ethics Committee and Study Design

This study was submitted to CEP/UNIFESP (Project No. 1556/2016), received the Certificate of Presentation for Ethical Appreciation (CAAE) no. 62062916.0.0000.5505 on the Brazil Platform, and was approved by the opinion embodied in CEP No. 1,855,656.

The study design presented a quantitative approach of the cross-sectional observational analytical type; several correlations were possible by submitting the collected data to statistical analysis. We chose to search for a greater sampling instead of a qualitative approach in order to measure, based on the conception of the study participants, the relevance of Spirituality/Religiosity as a therapeutic resource in clinical practice and the degree of agreement to the inclusion of didactic-pedagogical actions in medical education.

Scenario and the Survey Participants

Scenario

The study scenario was the EPM at the Campus São Paulo, UNIFESP, Brazil. The choice of EPM as the setting of our research is consolidated by its excellence in the medical field. It is the largest federal medical education institution in Brazil, founded on June 1, 1933. It built a history marked by its pioneering spirit in the health area: (1) On September 30, 1936 laid the cornerstone of Hospital São Paulo (HSP), the first teaching hospital in the country; (2) created the Department of Medicine anticipating the departmental structure, which only came to be officially implemented in Brazilian higher education in 1965; (3) implemented Medical Residency Programs in Brazil, already in 1957; (4) created, from 1970, *stricto sensu* graduate programs, which form professors and researchers with a high level of technical-scientific competence, attributing to the EPM the highest rates of scientific productivity per teacher, at the national level.

Survey Participants

The participants were Medical School students, regularly enrolled in 2017, of the following cycles: basic (1st and 2nd years), professionalizing (3rd and 4th years) and internship (5th and 6th years).

We asked the Coordination of the Medical Course to indicate two volunteers from each class. We presented the data collection instrument for each pair and made relevant adjustments suggested by the students. All students were invited, and their participation was voluntarily upon completion of the Free and Informed Consent Form (TCLE). The 12 volunteers were responsible for inviting colleagues[4], distributing, and returning the questionnaires and the Informed Consent to the researcher.

Data Collection Instrument

A standardized questionnaire was developed for this study and applied in the classroom, containing 18 Likert-scale multiple-choice questions and one semi-open question:

Sociodemographic Profile (Questions 1 to 6)

Only questions 3 and 6 are reported in this article since the others (gender, ethnicity, age group, and family income) did not have significant results.

(3) Which undergraduate year are you enrolled in? (1). First year of Medical School; (2). Second year of Medical School; (3). Third year of Medical School; (4). Fourth year of Medical School; (5). Fifth year of Medical School; (6). Sixth year of Medical School.

(6) What is your religious affiliation? (1). Catholic; (2). Evangelical Protestant; (3). Spiritist; (4). Another. Which one? (5). No affiliation/Agnostic; (6). No affiliation/Atheist. (Semi-open question).

Duke University Religious Index (Questions 7 to 11)

The DUREL (Koenig et al., 1997; Moreira-Almeida et al., 2008) measures three of the main dimensions of Religiosity related to health outcomes. The scores in the three dimensions should be analyzed separately and the scores should not be summed.

Organizational Religiosity

(7) How often do you attend church, synagogue, or other religious meetings? (1). more than once a week; (2). once a week; (3). A few times a month; (4). a few times a year; (5). once a year or less; (6). never.

Non-organizational Religiosity

(8) How often do you spend time in private religious activities, such as prayer, meditation, or Bible study? (1). more than once a day; (2). daily; (3). twice or more times a week; (4). once a week; (5). a few times a month; (6). rarely or never.

[4]We emphasize that there was no promise of bonuses to the students participating in the survey.

Intrinsic Religiosity

The following section contains three phrases about religious beliefs or experiences. Please note how much each sentence applies to you:

(9) In my life, I experience the presence of the Divine: (1). definitely true; (2). it is generally true; (3). I am not sure; (4). in general it is not true; (5). definitely not true.

(10) My religious beliefs are what really lie behind my whole approach to life: (1). definitely true; (2). it is generally true; (3). I am not sure; (4). in general it is not true; (5). definitely not true.

(11) I try hard to carry my religion over into all other dealings in life: (1). definitely true; (2). it is generally true; (3). I am not sure; (4). in general it is not true; (5). definitely not true.

Spirituality/Religiosity in the Clinical and Academic Contexts (Questions 12 to 19)

Formulated propositions based on scientific literature and with the following alternatives: I fully agree, agree, indifferent, disagree and fully disagree.

(12) A physician should ask about spiritual questions that directly or indirectly influence a patient's health positively.

(13) Regardless of their religious belief, a physician should respect a patient's belief.

(14) A physician's concern with a patient's spiritual dimension demonstrates empathy and improves doctor-patient relationship.

(15) A physician should consider a patient's emotional, sociocultural, and spiritual needs as well as their physical needs in the clinical practice.

(16) Care for the spiritual dimension is part of a patient's comprehensive and humanized care.

(17) Denying his/her own emotions and distancing from a patient's suffering is a defense strategy used by a physician.

(18) A good doctor should distance himself/herself from a patient's suffering.

(19) The proposition of didactic-pedagogical actions related to a patient's spiritual dimension in medical education is relevant.

Statistical Analysis

The data were input in Excel 2016 for Windows spreadsheets for proper information storage. Initially, the statistical analysis of the collected information was performed descriptively, using absolute and relative frequencies (percentage).

The inferential analyses used to confirm or refute evidence found in the descriptive analysis were performed by the statistical programming language R, version 3.3.2, R Core Team, 2016. The inferential analysis was performed by Spearman coefficient (s) for correlation of ordinal variables and by Kruskal-Wallis test for analysis of religious affiliation (Siegel and Castellan, 2006). In all conclusions obtained through inferential analyses, the alpha significance level equal to 5% was used.

RESULTS

Sociodemographic Profile

The study sample consisted of 72% of the total number of medical students from EPM, Campus São Paulo, UNIFESP, Brazil, regularly enrolled in the data collection period (from August to October 2017), with balanced participation among the three cycles of the medical program: 33% from the basic cycle (1st and 2nd years); 37% from the professionalizing cycle (3rd and 4th years); and 30% from the internship (5th and 6th years) (**Table 1**). The invitation made by the volunteers themselves to colleagues generated a high percentage of participants.

Out of all study participants, 61.4% declared religious affiliation: 29.7% Catholicism; 12.7% Evangelical churches (63 Evangelicals, one Protestant, one Presbyterian, one Adventist and three Christians); 11.7% Spiritism (doctrine codified by Allan Kardec), 7.3% other religious denominations (Buddhism-10; belief in God-8, Judaism-6, Umbanda-3, The Church of Jesus Christ of Latter-day Saints-2, Shamanism-2, Hinduism-1, Isla-1, Seicho-No-Ie-1, Messianism-1, Taoism-1, Shinto-1, Tenrikyo-1, Deism-1, and Wicca-1) (**Table 1**).

In our sample, we noticed a pairing between the percentage of Spiritists (11.7%) and Evangelicals (12.7%). The distribution of students in different cycles of the medical program by religious affiliations (**Table 1**) showed that the percentage of those who declared themselves Spiritists and other religious denominations increased from the basic cycle to internship, while that of Evangelicals decreased.

Out of 38.6% students who did not follow any religious orientation, 26.2% declared themselves to be agnostic and 12.4% atheists. When dealing with religious affiliation, we chose to divide and name this group as "not affiliated/agnostic" and "not affiliated/atheist" (**Table 1**).

The results indicated that disbelief did not increase over the course of the medical studies; on the contrary, the percentage of those who declared themselves atheists was 38% in the basic cycle, 34% in the professionalizing cycle, and 28% in the internship.

Only one fifth-year student, out of 547 participants, did not answer this question.

Duke University Religious Index

Organizational Religiosity

The measured Organizational Religiosity (OR) showed that 4.2% of the students attended religious institutions more than once a week, 10% once a week, 6.4% a few times a month, 27.6% a few times a year, 21.6% once a year or less, and 30.2% never attended (**Table 2**).

Considering that "more than once a week," "once a week," and "a few times a month" are positive responses to the religious institution's frequency, we have an approximate percentage of 18.3% in the 1st year, 26.9% in the 2nd year, 18.5% in the 3rd year, 27.5% in the 4th year, 20.6% in the 5th year, and 12.7% in the 6th year (**Table 2**).

Evangelicals had the highest religious frequency. Most Catholic, Spiritist, and other denomination students attend religious institutions "a few times a year." Agnostics focus between "once a year or less" and "never," and most atheists in "never" (**Table 3**).

Non-organizational Religiosity

Students' Non-organizational Religiosity (NOR) was measured by time dedicated to individual religious activities: 4.6% dedicate themselves to this practice more than once a day,

TABLE 1 | Distribution of research participants by religious affiliation and cycle/undergraduate year.

Cycle/ Undergraduate Year		Religious Affiliation												
		Catholic		Evangelical Protestant		Spiritist		Other		Not affiliated/ Agnostic		Not affiliated/ Atheist		TOTAL
		n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*
Basic	1st	27	27.5	16	16.3	9	9.2	4	4.1	23	23.5	19	19.4	98
	2nd	22	26.8	17	20.8	8	9.8	7	8.5	21	25.6	7	8.5	82
Professionalizing	3rd	27	29.3	10	10.9	9	9.8	3	3.3	31	33.7	12	13.0	92
	4th	28	25.7	18	16.5	14	12.9	8	7.3	30	27.5	11	10.1	109
Internship	5th	27	43.5	2	3.2	10	16.1	4	6.5	13	21.0	6	9.7	62
	6th	31	30.1	6	5.8	14	13.6	14	13.6	25	24.3	13	12.6	103
Total		162	29.7%	69	12.7%	64	11.7%	40	7.3%	143	26.2%	68	12.4%	546

TABLE 2 | Organizational Religiosity per undergraduate year.

Undergraduate Year	Attendance to Religious Institutions											
	more than once a week		once a week		a few times a month		a few times a year		once a year or less		never	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
1st	4	4.1	7	7.1	7	7.1	31	31.6	16	16.4	33	33.7
2nd	8	9.8	9	11.0	5	6.1	20	24.4	17	20.7	23	28.0
3rd	3	3.3	12	13.0	2	2.2	20	21.7	22	23.9	33	35.9
4th	4	3.7	15	13.8	11	10.0	36	33.0	21	19.3	22	20.2
5th	2	3.2	6	9.5	5	7.9	14	22.2	19	30.2	17	27.0
6th	2	2.0	6	5.8	5	4.9	30	29.1	23	22.3	37	35.9
Total	23	4.2%	55	10.0%	35	6.4%	151	27.6%	118	21.6%	165	30.2%

TABLE 3 | Attendance to religious institution by students from different religious affiliations.

Attendance to religious institution	Religious Affiliation													
	Catholic		Evangelical Protestant		Spiritist		Other		Not affiliated/ Agnostic		Not affiliated/ Atheist		Total	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
more than once a week	4	2.5	17	24.6	0	0	2	5.0	0	0	0	0	23	4.0%
once a week	23	14.2	25	36.2	5	7.8	2	5.0	0	0	0	0	55	10.0%
a few times a month	12	7.4	11	15.9	6	9.4	6	15.0	0	0	0	0	35	6.4%
a few times a year	64	39.5	11	15.9	30	46.9	17	42.5	24	16.8	4	5.9	150	27.5%
once a year or less	36	22.2	5	7.2	15	23.4	7	17.5	47	32.9	8	11.8	118	21.6%
never	23	14.2	0	0	8	12.5	6	15.0	72	50.3	56	82.4	165	30.5%

17.5% daily, 7.9% twice or more times a week, 6.2% once a week, 17% a few times a month, and 46.8% rarely or never (**Table 4**).

Since "rarely or never" is the only answer considered negative for Non-organizational Religiosity, we have an approximate positive percentage of 57.2% in the 1st year, 47.6% in the 2nd year, 45.6% in the 3rd year, 62.3% in the 4th year, 52.4% in the 5th year, and 51.5% in the 6th year (**Table 4**).

Among religious affiliations, 59.4% of Evangelicals dedicate themselves to individual religious activities at least once a day, followed by 32.1% of Catholics. Dedication of at least once a week to these activities was reported by 45.4% of Spiritists and 42.5% of students from other religious affiliations (**Table 5**).

Intrinsic Religiosity

Measurement of the centrality of transcendent in students' lives showed very strong (answer - definitely true) Intrinsic Religiosity (IR) in 13%; strong (answer - it is generally true) in 20.6%, moderate (answer - I am not sure) in 21.6%, weak (answer - in general it is not true) in 18.5%, and very weak (answer - definitely not true) in 26.3% (**Table 6**).

TABLE 4 | Non-organizational Religiosity per undergraduate year.

Undergraduate Year	Time dedicated to individual religious activities											
	more than once a day		Daily		twice or more times a week		once a week		a few times a month		rarely or never	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
1st	4	4.1	21	21.4	10	10.2	5	5.1	16	16.4	42	42.8
2nd	5	6.1	14	17.1	6	7.3	3	3.7	11	13.4	43	52.4
3rd	6	6.5	10	10.9	6	6.5	4	4.3	16	17.4	50	54.4
4th	7	6.4	18	16.5	8	7.3	11	10.1	24	22.0	41	37.7
5th	1	1.6	16	25.4	7	11.1	1	1.6	8	12.7	30	47.6
6th	2	2.0	17	16.5	6	5.8	10	9.7	18	17.5	50	48.5
Total	25	4.6%	96	17.5%	43	7.9%	34	6.2%	93	17.0%	256	46.8%

TABLE 5 | Time dedicated to individual religious activities by students from different religious affiliations.

Time dedicated to individual religious activities	Religious Affiliation													
	Catholic		Evangelical Protestant		Spiritist		Other		Not affiliated/ Agnostic		Not affiliated/ Atheist		Total	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
more than once a day	7	4.3	11	15.9	1	1.6	3	7.5	3	2.0	0	0.0	25	4.6%
Daily	45	27.8	30	43.5	7	11.0	8	20.0	6	4.0	0	0.0	96	17.6%
twice or more times a week	18	11.1	7	10.1	9	14.1	3	7.5	4	3.0	2	3.0	43	7.9%
once a week	10	6.2	5	7.3	12	18.7	3	7.5	4	3.0	0	0.0	34	6.2%
few times a month	36	22.2	10	14.5	15	23.4	12	30.0	16	11.0	3	4.0	92	16.8%
rarely or never	46	28.4	6	8.7	20	31.2	11	27.5	110	77.0	63	93.0	256	46.9%

TABLE 6 | Students' Intrinsic Religiosity per undergraduate year.

Undergraduate Year	Centrality of religion in life									
	very strong		strong		moderate		weak		very weak	
	n	%	n	%	n	%	n	%	n	%
1st	13	13.3	17	17.3	23	23.5	18	18.4	27	27.5
2nd	14	17.1	13	15.9	18	21.9	15	18.3	22	26.8
3rd	9	9.8	18	19.6	15	16.3	21	22.8	29	31.5
4th	20	18.3	27	24.8	21	19.3	20	18.3	21	19.3
5th	8	12.7	15	23.8	16	25.4	8	12.7	16	25.4
6th	7	6.8	23	22.3	25	24.3	19	18.4	29	28.2
Total	71	13.0%	113	20.6%	118	21.6%	101	18.5%	144	26.3%

Considering "definitely true" and "it is generally true" as positive responses to Intrinsic Religiosity, we have an approximate percentage of 30.6% in the 1st year, 33% in the 2nd year, 29.4% in the 3rd year, 43.1% in the 4th year, 36.5% in the 5th year, 29.1% in the 6th year (**Table 6**).

Most of the Evangelicals (82.6%) showed religious centrality ranging from strong to very strong. On the other hand, 63% of Catholics, 62.5% of Spiritists, and 67.5% of other religious denominations varied from centrality moderate to strong (**Table 7**).

Inferential Analysis - Duke University Religious Index

The Kruskal–Wallis test (**Table 8**) showed a significant difference between "Religious Affiliation" and the three aspects of DUREL. Organizational Religiosity (OR), Non-Organizational Religiosity (NOR) and Intrinsic Religiosity (IR) maintained the same pattern of behavior, presented high scores among students with religious affiliation; low scores among agnostics; and non-existent among atheists.

According to the estimates of Spearman's Correlation Coefficient (**Table 9**), we confirmed a statistically significant positive correlation between all questions of the Duke Religiosity Index among themselves, that is, when we observed an increase in one variable (OR, NOR and IR), simultaneously there was an increase in the other compared variable (OR, NOR and IR).

Spirituality/Religiosity in Clinical and Academic Contexts

We will present the data in two separate tables (**Tables 10**, **11**) so that they can be included in the body of the article.

TABLE 7 | Centrality of religion in the lives of students from different religious affiliations.

Centrality of Religion in life	Religious Affiliation													
	Catholic		Evangelical Protestant		Spiritist		Other		Not affiliated/ Agnostic		Not affiliated/ Atheist		Total	
	n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*	%
very strong	23	32.4	32	45.1	8	11.3	5	7.0	3	4.2	0	0	71	13.0%
strong	53	46.9	25	22.1	17	15.1	11	9.7	6	5.3	1	0.9	113	20.7%
moderate	49	41.9	8	6.8	23	19.7	16	13.7	18	15.4	3	2.5	117	21.4%
weak	28	27.7	4	4.0	10	9.9	7	6.9	46	45.6	6	5.9	101	18.5%
very weak	9	6.2	0	0	6	4.2	1	0.7	70	48.6	58	40.3	144	26.4%

TABLE 8 | Kruskal–Wallis test - religious affiliation and students' religiosity Duke University Religious Index (DUREL).

Kruskal–Wallis		DUREL					
religion versus		7	8	9	10	11	media
p-value		0.000	0.000	0.000	0.000	0.000	0.000
Ranks							
	Affiliation	**N**	**Mean Rank**		**Affiliation**	**N**	**Mean Rank**
OR 7	1	162	226.66	IR 10	1	162	218.73
	2	69	90.16		2	69	118.22
	3	64	234.93		3	64	240.43
	4	40	223.70		4	40	189.86
	5	143	371.26		5	143	373.49
	6	68	431.15		6	68	431.60
	Total	546			Total	546	
NOR 8	1	162	221.24	IR 11	1	162	229.48
	2	69	133.51		2	69	117.72
	3	64	250.47		3	64	206.27
	4	40	228.45		4	40	184.85
	5	143	361.71		5	143	381.10
	6	68	402.72		6	68	425.60
	Total	546			Total	546	
IR 9	1	162	189.02	IR media	1	162	205.55
	2	69	127.27		2	69	107.30
	3	64	243.05		3	64	224.38
	4	40	239.64		4	40	198.68
	5	143	369.85		5	143	381.19
	6	68	469.10		6	68	467.82
	Total	546			Total	546	

Spirituality/Religiosity in Clinical Context (Propositions 12 to 15)

There was agreement in propositions 12 to 15 of 79.3, 98.6, 92.5, and 97.1%, respectively, which suggests that students consider: the relevance of spiritual anamnesis, importance of respect for a patient's religious beliefs, use of this practice to demonstrate empathy and improve doctor-patient relationship, and the relevance of considering a patient's emotional, sociocultural, and spiritual needs in the clinical practice (**Table 10**).

Spirituality/Religiosity in Clinical and Academic Contexts (Propositions 16 to 19)

Propositions 16 and 17 had an agreement of 83.7% and 65.6%, respectively. There was a 90.4% disagreement for the proposition "A good doctor should distance himself/herself from a patient's suffering." Only 11% of the students are opposed to the proposition of didactic-pedagogical actions in medical education related to a patient's spiritual dimension while 61.7% consider it relevant and 27.3% are indifferent (**Table 11**).

TABLE 9 | Spearman coefficient (s) – undergraduate year and Duke University Religious Index (DUREL).

Spearman's rho			Undergr Year	OR	NOR	IR			
				7	8	9	10	11	media
Undergraduate Year		Correlation Coefficient	1.000	0.033	0.015	−0.022	−0.050	0.028	−0.013
		Sig. (2-tailed)	.	0.442	0.728	0.610	0.240	0.521	0.758
		N	547	547	547	547	547	547	547
OR	7	Correlation Coefficient	0.033	1.000	0.637	0.655	0.672	0.709	0.728
		Sig. (2-tailed)	0.442	.	0.000	0.000	0.000	0.000	0.000
		N	547	547	547	547	547	547	547
NOR	8	Correlation Coefficient	0.015	0.637	1.000	0.649	0.660	0.714	0.720
		Sig. (2-tailed)	0.728	0.000	.	0.000	0.000	0.000	0.000
		N	547	547	547	547	547	547	547
IR	9	Correlation Coefficient	−0.022	0.655	0.649	1.000	0.816	0.743	0.918
		Sig. (2-tailed)	0.610	0.000	0.000	.	0.000	0.000	0.000
		N	547	547	547	547	547	547	547
	10	Correlation Coefficient	−0.050	0.672	0.660	0.816	1.000	0.865	0.953
		Sig. (2-tailed)	0.240	0.000	0.000	0.000	.	0.000	0.000
		N	547	547	547	547	547	547	547
	11	Correlation Coefficient	0.028	0.709	0.714	0.743	0.865	1.000	0.921
		Sig. (2-tailed)	0.521	0.000	0.000	0.000	0.000	.	0.000
		N	547	547	547	547	547	547	547
	media	Correlation Coefficient	−0.013	0.728	0.720	0.918	0.953	0.921	1.000
		Sig. (2-tailed)	0.758	0.000	0.000	0.000	0.000	0.000	.
		N	547	547	547	547	547	547	547

Undergr Year, Undergraduate Year; OR, Organizational Religiosity (question 7); NOR, Non-organizational Religiosity (question 8); IR, Intrinsic Religiosity (questions 9, 10, 11 - media).

Inferential Analysis in Clinical and Academic Contexts

The Kruskal–Wallis test (**Table 12**) showed a significant difference between "Religious Affiliation" and propositions 14 and 16 of the clinical context – in both there was greater agreement between students who have religious affiliation and among agnostics, with lower agreement among atheists. The Kruskal–Wallis test (**Table 12**) showed a significant difference between "Religious Affiliation" and the purpose 19 of the academic context – there was greater agreement among students who have religious affiliation; lower among agnostics; and, among atheists.

Spearman's Correlation Coefficient (**Table 13**) confirmed a statistically significant negative correlation between the year of graduation in which the student is present and the proposition 12 ($S = -0.085$; $p = 0.046$) - as the student approaches his/her academic background, the agreement with the assertive increases. Spearman's Correlation Coefficient (**Table 13**) confirmed a statistically significant negative correlation between the year of graduation in which the student is present and the proposition 17 ($S = -0.180$; $p = 0.000$) - as the student approaches his/her academic background, the agreement with the assertive increases.

Spearman's Correlation Coefficient (**Table 13**) confirmed a statistically significant negative correlation between OR ($S = -0.0099$; $p = 0.020$) and the proposition 18 - the higher the Organizational Religiosity of the students, the lower the agreement with the proposition. Spearman's Correlation Coefficient (**Table 13**) confirmed a statistically significant negative correlation between IR ($S = -0.0090$; $p = 0.035$) and the proposition 18 - the higher the Intrinsic Religiosity of the students, the lower the agreement with the proposition.

Spearman's Correlation Coefficient (**Table 13**) confirmed a statistically significant positive correlation between OR and the proposition 14 ($S = 0.101$; $p = 0.018$) - the higher the Organizational Religiosity, the higher the students' degree of agreement to this assertion. Spearman's Correlation Coefficient (**Table 13**) confirmed a statistically significant positive correlation between OR and the proposition 15 ($S = 0.096$; $p = 0.025$) - the higher the Organizational Religiosity, the higher the students' degree of agreement to this assertion. Spearman's Correlation Coefficient (**Table 13**) confirmed a statistically significant positive correlation between IR and the questions 12, 14, and 15 of the clinical context - the higher the Intrinsic Religiosity, the higher the degree of agreement of the students to the questions related to Spirituality/Religiosity in the clinical and academic contexts.

Spearman's Correlation Coefficient (**Table 13**) confirmed a statistically significant positive correlation between DUREL and the proposition 16 [OR ($S = 0.127$; $p = 0.003$), NOR ($S = 0.118$; $p = 0.006$) and IR ($S = 0.185$; $p = 0.000$)] - the higher the DUREL scores, the higher the students' degree of agreement to this question. Spearman's Correlation Coefficient (**Table 13**) confirmed a statistically significant positive correlation between DUREL and the proposition 19 [OR ($S = 0.153$; $p = 0.000$); NOR ($S = 0.139$; $p = 0.001$); and IR ($S = 0.235$; $p = 0.000$)] - the higher the DUREL scores, the higher the degree of agreement of the students to this question.

TABLE 10 | Propositions regarding Spirituality/Religiosity in the clinical context.

Propositions	Undergraduate Year	I fully agree		Agree		Indifferent		Disagree		I strongly disagree		Total
		n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*
(12) A physician should ask about spiritual questions that directly or indirectly influence a patient's health positively.	1st	17	17.3	49	50.0	20	20.4	7	7.2	5	5.1	98
	2nd	25	30.5	45	54.9	9	11.0	3	3.6	0	0	82
	3rd	25	27.2	52	56.5	12	13.0	2	2.2	1	1.1	92
	4th	37	33.9	50	45.9	16	14.7	5	4.6	1	0.9	109
	5th	22	34.9	30	47.6	8	12.7	2	3.2	1	1.6	63
	6th	28	27.2	54	52.4	13	12.6	5	4.9	3	2.9	103
	Total	154	28.1%	280	51.2%	78	14.3%	24	4.4%	11	2.0%	547
(13) Regardless of their religious belief, a physician should respect a patient's belief.	1st	86	87.8	11	11.2	1	1.0	0	0	0	0	98
	2nd	68	83.0	12	14.6	0	0	2	2.4	0	0	82
	3rd	79	85.9	10	10.8	1	1.1	1	1.1	1	1.1	92
	4th	101	92.7	8	7.3	0	0	0	0	0	0	109
	5th	52	82.5	10	15.9	0	0	1	1.6	0	0	63
	6th	85	82.5	17	16.5	1	1.0	0	0	0	0	103
	Total	471	86.1%	68	12.5%	3	0.5%	4	0.7%	1	0.2%	547
(14) A physician's concern with a patient's spiritual dimension demonstrates empathy and improves doctor-patient relationship.	1st	46	47.0	40	40.8	10	10.2	1	1.0	1	1.0	98
	2nd	46	56.1	32	39.0	4	4.9	0	0.0	0	0.0	82
	3rd	47	51.1	38	41.3	5	5.4	2	2.2	0	0.0	92
	4th	72	66.1	34	31.2	2	1.8	1	0.9	0	0.0	109
	5th	40	63.5	19	30.1	2	3.2	2	3.2	0	0.0	63
	6th	52	50.5	40	38.8	8	7.8	3	2.9	0	0.0	103
	Total	303	55.4%	203	37.1%	31	5.7%	9	1.7%	1	0.1%	547
(15) A physician should consider a patient's emotional, sociocultural, and spiritual needs as well as their physical needs in the clinical practice.	1st	52	54.8	40	42.1	2	2.1	1	1.0	0	0	95
	2nd	61	74.4	19	23.2	1	1.2	1	1.2	0	0	82
	3rd	65	71.4	26	28.6	0	0.0	0	0.0	0	0	91
	4th	74	68.5	29	26.9	4	3.7	1	0.9	0	0	108
	5th	38	61.3	21	33.9	2	3.2	1	1.6	0	0	62
	6th	63	61.2	37	35.9	2	1.9	1	1.0	0	0	103
	Total	353	65.3%	172	31.8%	11	2.0%	5	0.9%	0	0	541

Spearman's Correlation Coefficient (**Table 14**) confirmed statistically significant negative correlation between propositions 18 and 14 ($S = -0.163$; $p = 0.000$) - the higher the agreement of the students with the question 14, the lower the agreement with the proposition 18. Spearman's Correlation Coefficient (**Table 14**) confirmed statistically significant negative correlation between propositions 18 and 15 ($S = -0.154$; $p = 0.000$) - the higher the agreement of the students with the question 15, the lower the agreement with the proposition 18. Spearman's Correlation Coefficient (**Table 14**) confirmed statistically significant negative correlation between propositions 18 and 16 ($S = -0.152$; $p = 0.000$) - the higher the agreement of the students with the question 16, the lower the agreement with the proposition 18. Spearman's Correlation Coefficient (**Table 14**) confirmed statistically significant negative correlation between propositions 18 and 19 ($S = -0.157$; $p = 0.000$) - the higher the agreement of the students with the question 19, the lower the agreement with the proposition 18.

Spearman's Correlation Coefficient (**Table 14**) confirmed statistically significant positive correlation between questions in the clinical context 12 to 16. Spearman's Correlation Coefficient (**Table 14**) confirmed statistically significant positive correlation between questions in the clinical context 12 to 16 with proposition 19 of the academic context - the greater the agreement of the students with the related propositions, the greater the agreement with proposition 19.

DISCUSSION

There are several theories used by scientists of religion. Hanegraaff (1999) established, in a threefold scheme, the difference between religion and spirituality: *religion* (general), *a religion* (specific) and *a spirituality*. The author presents a subtle difference when it comes to defining Religion in general and *a* specific *religion*. *Religion* would be "any symbolic system," while *A Religion* would be "a symbolic system, embedded in a social institution," both influence human actions and allow "to maintain ritualistic contact between the everyday world and a more general meta-empirical picture of meanings." *A spirituality* is defined as "*any* human practice that maintains contact between the everyday world and a more general meta-empirical picture of meanings through the individual manipulation of symbolic systems" (Hanegraaff, 1999, p. 371–372).

Asad (2010) problematizes the idea of an anthropological definition of religion by referring this effort to a particular history

TABLE 11 | Propositions related to Spirituality/Religiosity in clinical and academic contexts.

Propositions	Year of Graduation	I fully agree		Agree		Indifferent		Disagree		I strongly disagree		Total
		n	%	*n*	%	*n*	%	*n*	%	*n*	%	*n*
(16) Care for the spiritual dimension is part of a patient's comprehensive and humanized care.	1st	36	36.7	43	43.9	14	14.3	4	4.1	1	1.0	98
	2nd	31	37.8	41	50.0	7	8.5	3	3.7	0	0.0	82
	3rd	43	46.8	36	39.1	8	8.7	5	5.4	0	0.0	92
	4th	52	47.7	44	40.4	7	6.4	6	5.5	0	0.0	109
	5th	26	42.0	24	38.7	8	12.9	3	4.8	1	1.6	62
	6th	39	37.9	42	40.8	12	11.6	8	7.8	2	1.9	103
	Total	227	41.6%	230	42.1%	56	10.3%	29	5.3%	4	0.7%	546
(17) Denying his/her own emotions and distancing from a patient's suffering is a defense strategy used by a physician.	1st	5	5.1	49	50.0	13	13.3	23	23.5	8	8.1	98
	2nd	7	8.5	42	51.2	11	13.4	18	22.0	4	4.9	82
	3rd	11	12.0	49	53.3	14	15.2	17	18.5	1	1.0	92
	4th	18	16.5	55	50.5	17	15.6	16	14.7	3	2.7	109
	5th	11	17.7	38	61.3	5	8.1	7	11.3	1	1.6	62
	6th	18	17.5	55	53.4	14	13.6	13	12.6	3	2.9	103
	Total	70	12.8%	288	52.8%	74	13.5%	94	17.2%	20	3.7%	546
(18) A good doctor should distance himself/herself from a patient's suffering.	1st	0	0.0	1	1.0	5	5.1	74	75.5	18	18.4	98
	2nd	0	0.0	0	0.0	4	4.9	45	54.9	33	40.2	82
	3rd	0	0.0	0	0.0	8	8.7	55	59.8	29	31.5	92
	4th	2	1.8	3	2.8	8	7.3	70	64.2	26	23.9	109
	5th	0	0.0	2	3.2	5	8.1	44	71.0	11	17.7	62
	6th	0	0.0	2	1.9	12	11.7	57	55.3	32	31.1	103
	Total	2	0.4%	8	1.5%	42	7.7%	345	63.2%	149	27.2%	546
(19) The proposition of didactic-pedagogical actions related to a patient's spiritual dimension in medical education is relevant.	1st	12	12.2	44	44.9	31	31.6	7	7.2	4	4.1	98
	2nd	16	19.5	39	47.6	21	25.6	5	6.1	1	1.2	82
	3rd	12	13.2	41	45.0	26	28.6	11	12.1	1	1.1	92
	4th	14	12.9	60	55.1	26	23.8	7	6.4	2	1.8	109
	5th	7	11.3	28	45.2	19	30.6	6	9.7	2	3.2	62
	6th	17	16.5	46	44.7	26	25.2	10	9.7	4	3.9	103
	Total	78	14.3%	258	47.4%	149	27.3%	46	8.4%	14	2.6%	545

of knowledge and power, including a particular understanding of our legitimate past and future, from which the modern world was built. It states that many of the theories about religion come from a modern Western model, which imprints on religion a trans-historical and cross-cultural character. It argues that there cannot be a universal definition of religion, not only because its constituent elements and its relationships are historically specific, but because this definition is itself the historical product of discursive processes.

In 1998, the World Health Organization (World Health Organization [WHO], 1998) presented a proposal for the definition of religion, religiosity, and spirituality. In the WHO definition, Religion would be "the belief in the existence of a dominant supernatural power, creator and controller of the universe, which gave the human being a spiritual nature that continues to exist after the death of the body," while Religiosity would be the act of following, practicing, or believing in a religion. With reference to the definition of Spirituality, who says it would be "[.] the belief in a non-material nature with the assumption that there is more to life than what can be perceived or fully understood." He adds that "Spirituality addresses issues such as the meaning of life and purpose in life and is not necessarily limited to any specific types of beliefs or practices" (World Health Organization [WHO], 1998, p. 7).

Stern (2017) states that the differentiation between religion, religiosity and spirituality is very difficult to trace and points out several problems in the WHO definitions from the perspective of the scholar of religion. Initially, the definitions of religion and religiosity are based exclusively on the model of Abrahamic religions. By using the term "Spirituality," which would not necessarily relate to any religion, the WHO supports physicians to act in this field without hurting their codes of ethics but does not identify elements that can be only "spiritual," without being "religious."

The scientific literature presents a wide variety of works that deal with the inclusion of the Discipline of Spirituality and Religiosity in the medical curriculum. However, in pedagogical projects there is no specification of the most indicated professional category to coordinate this course and teach the classes. Stern (2018) believes that it is possible, with the application of concepts from the study of religion, to build professional bridges between study of religion and health professionals. By the specific training in the theme and acquired skills, the scholar of religion has the most appropriate profile to train medical students in Spirituality/Religiosity.

We agree that academic training does not empower physicians, future teachers, to use the spiritual/religious context in clinical practice, therefore, they will not be able to transmit to their students a knowledge they do not have. It is necessary that a multidisciplinary team act, led by a scholar of religion, who can teach students the bases of religious traditions, so diverse in Brazil, so that when they receive, for example, a

TABLE 12 | Kruskal–Wallis test - clinical and academic contexts.

Kruskal–Wallis	**Clinical and Academic Contexts - Questions**							
religion versus	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**
p-value	0.227	0.137	0.013	0.707	0.038	0.121	0.877	0.003

Ranks

	Affiliation	**N**	**Mean Rank**		**Affiliation**	**N**	**Mean Rank**
12	1	162	258.08	16	1	162	246.06
	2	69	292.01		2	69	280.39
	3	64	268.01		3	64	293.57
	4	40	266.56		4	40	262.41
	5	143	270.42		5	143	277.92
	6	68	307.18		6	68	310.20
	Total	546			Total	546	
13	1	162	269.43	17	1	162	294.20
	2	69	266.69		2	69	271.24
	3	64	273.33		3	64	238.84
	4	40	262.40		4	40	243.46
	5	143	270.15		5	143	274.10
	6	68	303.85		6	68	275.49
	Total	546			Total	546	
14	1	162	264.95	18	1	162	279.54
	2	69	295.11		2	69	281.41
	3	64	276.05		3	64	268.91
	4	40	230.18		4	40	286.31
	5	143	262.09		5	143	265.40
	6	68	319.02		6	68	264.89
	Total	546			Total	546	
15	1	162	279.61	19	1	162	257.20
	2	69	263.74		2	69	267.24
	3	64	265.87		3	64	265.23
	4	40	263.39		4	40	232.90
	5	143	268.08		5	143	280.56
	6	68	293.37		6	68	335.50
	Total	546			Total	546	

patient who is a Jehovah's Witness know that they will not be able to perform blood transfusion without authorization. In the prescription of medications, other religions have restrictions on substances, days of the week, schedules. The scholar of religion will be able to guide students on how to detect spiritual suffering and approach the patient about wanting to talk to the chaplain or, if not, with the religious leader of his religious belief. The doctor can work together with the scholar of religion to explain to the students how to proceed with the taking of spiritual history. Validated simple instruments, as FICA [F (Faith/belief)/I (Importance or influence)/C (Community)/A (Action in treatment)] (Puchalski and Romer, 2000) and HOPE [H (Sources of Hope)/O (Organized Religion)/P (Personal spirituality and practice)/E (Effects on medical treatment and terminal matters)] (Anandarajah and Hight, 2001), for example, can detect, in a matter of minutes, if the patient needs spiritual care, not for the doctor to treat him, but to refer him to the qualified professional.

Medicine is a compassionate and selfless service profession and, increasingly, the field recognizes the need to integrate training in Spirituality in patient care as part of medical education (Puchalski and Larson, 1998; Puchalski, 2001b; Lucchetti et al., 2012; Reginato et al., 2016). Barnett and Fortin (2006) found that both medical undergraduates and residents changed their attitudes regarding their appreciation of the approach of a patient's spiritual dimension in medical anamnesis after adequate training. It is considered that, through repeated and varied exposure, students will be able to build a more positive attitude toward the importance attributed to the spiritual approach in clinical practice. Knowledge brings security and Spirituality is no longer considered dependent on religious affiliation, conviction, or practice. By acquiring confidence in the taking of spiritual history, they begin to value it and consider it beneficial to patients (Chibnall and Duckro, 2000; Chibnall and Brooks, 2001; Chibnall et al., 2002; Fortin and Barnett, 2004; Anandarajah and Mitchell, 2007; Culliford, 2009).

TABLE 13 | Spearman coefficient (s) – undergraduate year/DUREL and clinical/academic contexts.

Spearman's rho			Clinical and Academic Contexts - Questions							
			12	13	14	15	16	17	18	19
UndergraduateYear		Correlation Coefficient	−0.085	0.024	−0.050	0.019	−0.001	−0.180	−0.043	−0.002
		Sig. (2-tailed)	0.046	0.577	0.245	0.659	0.988	0.000	0.311	0.971
		N	547	547	547	547	547	547	547	547
OR	7	Correlation Coefficient	0.069	0.065	0.101	0.096	0.127	−0.016	−0.099	0.153
		Sig. (2-tailed)	0.107	0.131	0.018	0.025	0.003	0.704	0.020	0.000
		N	547	547	547	547	547	547	547	547
NOR	8	Correlation Coefficient	0.061	0.026	0.047	0.073	0.118	0.003	−0.053	0.139
		Sig. (2-tailed)	0.155	0.539	0.272	0.087	0.006	0.953	0.212	0.001
		N	547	547	547	547	547	547	547	547
IR	9	Correlation Coefficient	0.118	0.099	0.150	0.117	0.202	−0.018	−0.106	0.233
		Sig. (2-tailed)	0.006	0.020	0.000	0.006	0.000	0.679	0.013	0.000
		N	547	547	547	547	547	547	547	547
	10	Correlation Coefficient	0.110	0.088	0.154	0.127	0.173	−0.002	−0.081	0.210
		Sig. (2-tailed)	0.010	0.040	0.000	0.003	0.000	0.962	0.059	0.000
		N	547	547	547	547	547	547	547	547
	11	Correlation Coefficient	0.096	0.071	0.139	0.136	0.138	0.032	−0.069	0.208
		Sig. (2-tailed)	0.025	0.097	0.001	0.001	0.001	0.459	0.108	0.000
		N	547	547	547	547	547	547	547	547
	media	Correlation Coefficient	0.119	0.096	0.160	0.133	0.185	0.006	−0.090	0.235
		Sig. (2-tailed)	0.005	0.025	0.000	0.002	0.000	0.891	0.035	0.000
		N	547	547	547	547	547	547	547	547

Legends: OR, Organizational Religiosity (question 7); NOR, Non-organizational Religiosity (question 8); IR, Intrinsic Religiosity (questions 9, 10, 11 - media).

TABLE 14 | Spearman coefficient (s) – clinical and academic contexts.

Spearman's rho			Clinical and Academic Contexts							
			12	13	14	15	16	17	18	19
Clinical And Academic Contexts	12	Correlation Coefficient	1.000	0.151	0.497	0.333	0.466	0.057	−0.052	0.343
		Sig. (2-tailed)	.	0.000	0.000	0.000	0.000	0.185	0.220	0.000
		N	547	547	547	547	547	547	547	547
	13	Correlation Coefficient	0.151	1.000	0.254	0.230	0.197	0.021	−0.071	0.129
		Sig. (2-tailed)	0.000	.	0.000	0.000	0.000	0.630	0.099	0.002
		N	547	547	547	547	547	547	547	547
	14	Correlation Coefficient	0.497	0.254	1.000	0.375	0.527	0.049	−0.163	0.408
		Sig. (2-tailed)	0.000	0.000	.	0.000	0.000	0.256	0.000	0.000
		N	547	547	547	547	547	547	547	547
	15	Correlation Coefficient	0.333	0.230	0.375	1.000	0.435	0.105	−0.154	0.312
		Sig. (2-tailed)	0.000	0.000	0.000	.	0.000	0.014	0.000	0.000
		N	547	547	547	547	547	547	547	547
	16	Correlation Coefficient	0.466	0.197	0.527	0.435	1.000	0.029	−0.152	0.457
		Sig. (2-tailed)	0.000	0.000	0.000	0.000	.	0.503	0.000	0.000
		N	547	547	547	547	547	547	547	547
	17	Correlation Coefficient	0.057	0.021	0.049	0.105	0.029	1.000	0.072	0.053
		Sig. (2-tailed)	0.185	0.630	0.256	0.014	0.503	.	0.093	0.214
		N	547	547	547	547	547	547	547	547
	18	Correlation Coefficient	−0.052	−0.071	−0.163	−0.154	−0.152	0.072	1.000	−0.157
		Sig. (2-tailed)	0.220	0.099	0.000	0.000	0.000	0.093	.	0.000
		N	547	547	547	547	547	547	547	547
	19	Correlation Coefficient	0.343	0.129	0.408	0.312	0.457	0.053	−0.157	1.000
		Sig. (2-tailed)	0.000	0.002	0.000	0.000	0.000	0.214	0.000	.
		N	547	547	547	547	547	547	547	547

We emphasize that with the appropriate training in Spirituality/Religiosity, the main obstacles pointed out by physicians to take a patient's spiritual history can be overcome. Training should lead them to: (1) acquire a more positive attitude toward the importance attributed to the spiritual approach in clinical practice; (2) have a better understanding of the role of Spirituality in Health; (3) know the foundations of the main religious traditions in order to acquire subsidies to respect patients' beliefs and understand their spiritual needs; (4) develop spiritual care skills to care for patients from different cultures and different spiritual and religious contexts; (5) acquire knowledge on the philosophy of care; (6) be sensitized to a patient's spiritual and cultural needs; (7) recognize a patient's spiritual suffering and promote comprehensive care; (8) be naturally receptive and safe to support and encourage patients' religious beliefs; (9) learn that more than 3,300 scientific studies on Spirituality/Religiosity and Health have proven that religious activities and beliefs are related to better physical and mental health, and quality of life in the most different aspects; (10) explore the relevant instruments published in the literature that guide the taking of a patient's spiritual history; (11) take the spiritual history during the anamnesis, preferably at the end of social history; (12) practice doing spiritual anamnesis a few times to be able to carry it out in a few minutes; (13) become aware of their own finitude, and understand death as a natural process of life (Chibnall and Duckro, 2000; Chibnall et al., 2002; Graves et al., 2002; Sandor et al., 2006; Anandarajah and Mitchell, 2007; Feldstein et al., 2008; Culliford, 2009; Lucchetti et al., 2010, 2013a, 2015; Koenig, 2012a,b, 2015; Koenig et al., 2012; Kübler-Ross, 2012; Lucchetti and Lucchetti, 2014; Talley and Magie, 2014; Arantes, 2016; Cavalcante et al., 2016; Moreira-Almeida et al., 2016; Peres et al., 2018; Puchalski et al., 2020).

It is noteworthy to mention that, in the medical area, the therapeutic use of a patient's spiritual dimension in Palliative Care stands out (D'Alessandro et al., 2020; Puchalski et al., 2020). Other areas, such as Psychiatry and Cardiology, have also shown interest in their patients' spiritual dimension. The *Position Statement on Spirituality and Religion in Psychiatry*, proposed by the Religion, Spirituality and Psychiatry Section of the World Psychiatric Association (WPA), was published, and approved by the WPA executive committee in September 2015 (Moreira-Almeida et al., 2016). In Cardiology, Spirituality is highlighted in the *Updated Cardiovascular Prevention Guideline of the Brazilian Society of Cardiology,* published in 2019, including a new chapter entitled *Spirituality and Psychosocial Factors in Cardiovascular Medicine* (Avezum and Esporcatte, 2019). The *Prevention Guidelines of the Brazilian Society of Cardiology* guide physicians – and health professionals in general – on how to better address spiritual issues during a consultation. It is intended to understand how feelings, such as gratitude, resilience, and forgiveness, and even spiritual conflicts affect a patient's health. Patients' degree of Spirituality and Religiosity can be evaluated in history or spiritual anamnesis because, for those who follow a religion or have strong sense of Spirituality, keeping it active during medical care brings numerous health benefits and improves the doctor-patient relationship (Avezum and Esporcatte, 2019).

There are different ways of including Spirituality in academic activities of medical schools, such as: elective courses; lectures; standardized patient interviews; chaplains' follow-ups; reading scientific articles on Spirituality/Religiosity in clinical practice and related subjects; discussions in small groups; assembly of a practical setting for taking spiritual history (Fortin and Barnett, 2004; King et al., 2004).

The spiritual dimension stood out in the academic and scientific environment in the 1960s, when the first studies on Spirituality/Religiosity in clinical care were published (Puchalski, 2001b). In the academic context of Spirituality/Religiosity in Health, we should highlight the pioneering role of Christina Puchalski, who taught the first elective course in Spirituality and Health at the George Washington University School of Medicine in 1992 (Lucchetti et al., 2012b; Moreira-Almeida and Lucchetti, 2016).

Since then, several Faculties of Medicine have included courses and subjects on spirituality in their curriculum notes: in the United States more than 85%, in Canada 70% and in the United Kingdom between 31% and 59% (Neely and Minford, 2008; Lucchetti et al., 2012b; Moreira-Almeida and Lucchetti, 2016). In Brazil, 10.4% of the Faculties of Medicine have specific courses on spirituality and health and 40.5% included spirituality and health content in their disciplines (Lucchetti et al., 2012b).

Our research object that proposes the insertion of Spirituality/Religiosity in medical education in Brazil is anchored in the relevant approval data of this discipline in several countries, as mentioned earlier. In Brazil and in the world, there has been an increase in the number of Spirituality and Health research groups, events, funding, publications in high-impact journals and space in medical conferences, in addition to recommendations of the main international bodies for the inclusion of Spirituality in clinical care and health education, among other initiatives (Puchalski, 2001b; Modjarrad, 2004; Moreira-Almeida, 2007; Lucchetti and Granero, 2010; Lucchetti et al., 2012b).

We developed this study to verify the opinion of undergraduate medical students regarding the use of a patient's Spirituality/Religiosity as a therapeutic resource in clinical practice and the inclusion of didactic-pedagogical actions in the medical curriculum. The sample consisted of 72% of the total population of EPM medical students whereas the samples by other authors, who also developed their studies with medical students distributed in the six undergraduate years on the theme of Spirituality/Religiosity in clinical practice, comprised a smaller portion of the population: 63% (Banin et al., 2013), 51.5% (Borges et al., 2013), and 60.3% (Lucchetti et al., 2014). The high rate of students' support to our research shows that the theme on Spirituality/Religiosity is considered relevant in the Brazilian medical academic space. First step toward the insertion of changes is the availability and interest of addressing an unusual theme such as the insertion of Spirituality/Religiosity in medical courses. We present the distribution of research participants by religious affiliation: Catholic (29.7%), Evangelical Protestant (12.7%), Spiritist (11.7%), others religious denominations (7.3%), not affiliated/agnostic (26.2%), and not affiliated/atheist (12.4%) (**Table 1**).

In the academic scenario, as far as research is available, the *Duke Religious Index* (DUREL) (Koenig et al., 1997) presents high credibility, a relevant factor for us to include it in our research. According to Koenig and Büssing (2010), DUREL contemplates the different dimensions of religiosity related to health outcomes: organizational (OR) (**Tables 2**, **3**), non-organizational (NOR) (**Tables 4**, **5**) and intrinsic (IR) (**Tables 6**, **7**). They also state that, although religious affiliation is an important fact, it tells us little about the student's religiosity. The statistical test applied showed a significant difference between religious affiliation and students' religiosity. The scores found were high of organizational religiosity (frequency to religious institution), non-organizational religiosity (individual religious experience) and intrinsic religiosity (centrality of religion in life) among students with religious affiliation; low among agnostics; and non-existent among atheists (**Table 8**). We also found a statistically significant positive correlation between all DUREL issues among themselves (**Table 9**).

As for Organizational Religiosity, the percentage we found of 51.8% of student's who attended religious institutions "once a year and never" (**Table 3**) was much higher than the data found in studies that applied DUREL to medical students, such as the one by Lucchetti et al. (2014), who reported 36.6%. The participants of our research who have religious affiliation have a high frequency score at the religious temple (**Table 8**), and a statistically significant positive correlation between OR, NOR and IR, with simultaneous increase of variables (**Table 9**). We verified that Evangelicals were the ones with the highest religious frequency. Most Catholic, Spiritist and other denomination students attended religious institutions "a few times a year," according to Uecker et al. (2007), the attendance to religious services occurred as a family habit that was lost upon starting the studies at the university.

The students' Non-organizational Religiosity was measured by the time dedicated to individual religious activities. Students with religious affiliation have a high score of time dedicated to individual religious activities (**Table 5**), and a statistically significant positive correlation between NOR, OR and IR, with simultaneous increase in variables (**Table 9**). Our results showed that 22.1% of the students were dedicated to individual religious activities daily or more than once a day (**Table 4**), a considerably lower percentage than those found by Borges et al. (2013) and Lucchetti et al. (2014), respectively 38.8% and 32.7%. Uecker et al. (2007) reported that the low percentage of dedication to the practice of religious activities is due to the dazzle with the university and social life of students entering a world full of extra-religious activities. Among religious affiliations, 59.4% of Evangelicals are engaged in individual religious activities at least once a day, followed by 32.1% of Catholics. Dedication of at least once a week to these activities was reported by 45.4% of Spiritists and 42.5% of students from other religious affiliations (**Table 5**).

As for Intrinsic Religiosity, most Evangelicals had religious centrality varying from strong to very strong (82.6%). Already, 63% of Catholics, 62.5% Spiritists, and 67.5% of other religious denominations presented centrality ranging mostly from moderate to strong, suggesting that Religiosity occupies an important space in their lives (**Table 7**). Students with religious affiliation have a high score of centralities of religion in life (**Table 8**), and a statistically significant positive correlation between IR, OR and NOR, with simultaneous increase of variables (**Table 9**). Koenig et al. (2012) pointed out that there is an unequivocal relationship between good health indicators and the exercise of intrinsic Religiosity.

Discussing the results of DUREL, which showed us the religiosity of the research participants, we will go to the discussion of the third block. In it we will evaluate the degree of agreement of students to questions formulated, based on scientific literature, which see Spirituality/Religiosity within a clinical context. We will present questions numbers 12 to 18, discussing each of them.

From all study participants, 79.3% responded favorably to the proposition 12: "A physician should ask about spiritual questions that directly or indirectly influence a patient's health positively" (**Table 10**). There was a statistically significant negative correlation between the year of graduation in which the student is and this question. As the student approaches his/her graduation, the agreement with the assertive one increases (**Table 13**). We also found a statistically significant positive correlation between this question and Intrinsic Religiosity. The higher the IR score, the higher the students' level of agreement with the assertive (**Table 13**). Other studies have observed that most physicians recognize the importance and value of patients' spiritual beliefs in their health and feel that they need to know such beliefs (Anandarajah and Hight, 2001; Chibnall and Brooks, 2001; Monroe et al., 2003; Puchalski, 2006; Lucchetti et al., 2010; Koenig, 2012a,b; Saad and De Medeiros, 2012; Puchalski et al., 2020). The same positive impact was observed in medical students in the samples by Banin et al. (2013) and Lucchetti et al. (2013b). Ellis et al. (1999) showed that most physicians (more than 90%) recognize that spiritual factors are an important health component and most of them (70% to 82%) state that this can influence a patient's health. Moreover, the authors also reported that 85% of physicians said they should be aware of patients' religious/spiritual beliefs, and 89% felt entitled to ask about such beliefs. These data corroborate our research object regarding the insertion of Spirituality/Religiosity in clinical practice.

In the proposition 13: "Regardless of their religious belief, a physician should respect a patient's belief," the degree of agreement was 98.6%. Three students opted for the "indifferent" alternative: a 1st-year atheist; a 3rd-year catholic; and a 6th-year agnostic. Four students marked "disagree": two 2nd-year, agnostic; one of the third-year, atheist; and a fifth-year catholic. A single third-year student, a catholic, marked "I strongly disagree" (**Table 10**). We found a statistically significant positive correlation between this question and Intrinsic Religiosity. The higher the IR score, the higher the students' degree of agreement with this statement (**Table 13**). Kørup et al. (2021) state that a physician should provide professional care, respecting and validating a patient's beliefs, even if they disagree. The results by Barnett and Fortin (2006), in a study conducted with resident physicians and medical students, showed that a physician's spiritual/religious beliefs could affect their ability to communicate and care for patients. They concluded that the strongest indicator for a physician to address spiritual needs or not is linked to that physician's degree of Religiosity or

Spirituality and not to a patient's health condition. Chibnall and Brooks (2001) developed important work on the role of physicians' religious beliefs in clinical practice and presented several suggestions to reduce physicians' discomfort with spiritual anamnesis. Steinhauser et al. (2000) emphasized that detecting when the personal values of health professionals themselves based on a theistic or atheistic worldview-impact patient care is a daily challenge in clinical practice.

In the proposition 14: "A physician's concern with a patient's spiritual dimension demonstrates empathy and improves doctor-patient relationship," we found an agreement of 92.5% (**Table 10**). There was greater agreement with this proposition among students who have religious affiliation, and among agnostics (**Table 12**). We confirmed a statistically significant positive correlation between organizational religiosity and this proposition. The higher the OR, the higher the level of agreement of the students (**Table 13**). We also found a statistically significant positive correlation between this question and Intrinsic Religiosity. The higher the IR score, the higher the students' degree of agreement with this statement (**Table 13**). Some studies, such as the one by Peres et al. (2020), showed that many students agreed that patients should have their beliefs addressed and validated and that those beliefs could have an important impact, not only on the prognosis and outcome of the treatment, but also on the doctor-patient relationship. For D'Alessandro et al. (2020), the respect for a patient's spiritual dimension allows a physician to better understand how a patient experiences the process of illness and to establish a deeper relationship with them. Frankl (1984) tells us that Spirituality can be a source of strength or a source of deep existential anguish. The author states that when, through the spiritual dimension, a physician establishes a connection with a patient, he/she achieves positive results such as those documented in several studies on the doctor-patient relationship. D'Alessandro et al. (2020) claim that patients may develop spiritual distress as the disease progresses. The authors stated that a patient often needs someone who is indeed present, willing to listen to their pains and anxieties to help them find answers, transcend, and reframe suffering. They concluded that it is very important for a doctor to be attentive, to listen empathically, and to establish a relationship of trust so that a patient can express their deepest anxieties.

The proposition 15: "A physician should consider a patient's emotional, sociocultural, and spiritual needs as well as their physical needs in the clinical practice" received 97.1% agreement (**Table 10**). We confirmed a statistically significant positive correlation between this proposition and organizational religiosity. The higher the OR, the higher the level of agreement of the students (**Table 13**). We also found a statistically significant positive correlation between this question and Intrinsic Religiosity. The higher the IR score, the higher the students' degree of agreement with this assertion (**Table 13**). The fact that medical students know the definition of Health recommended by WHO as "a state of complete physical, mental and social well-being and not only the absence of disease or illness" (World Health Organization [WHO], 1946) help them understand and agree with the above assertion. Due to the lack of consensus in the definition of Spirituality, the spiritual dimension was not included in the definition of Health (World Health Organization [WHO], 1999), but the WHO included it as a domain in its Quality-of-Life Instrument (WHOQOL-SRPB, 2002), emphasizing its importance.

The proposition 16: "Care for the spiritual dimension is part of a patient's comprehensive and humanized care" obtained an agreement of 83.7% (**Table 11**). A significant difference was confirmed between Religious Affiliation and this proposition. There was greater agreement among students who have religious affiliation, and among agnostics (**Table 12**). We found a statistically significant positive correlation between this proposition and DUREL, the higher the DUREL scores (OR, NOR and IR), the higher the degree of agreement of the students to this question (**Table 13**). We also confirmed statistically significant positive correlations between the questions of the clinical context from 12 to 16 among themselves, which shows that the increase in the score of the variables is simultaneous (**Table 14**). In the Manual of Palliative Care, D'Alessandro et al. (2020) state that the recognition of spiritual needs is an essential part of patient-centered medicine. For many authors, an awareness of the importance of the spiritual dimension while treating the patient indicates the resurgence of a medical practice in which a human being should be valued in all their complexity (Peres et al., 2007; Lucchetti et al., 2013b; Reginato et al., 2016; Damiano et al., 2017) as well as the inclusion of spiritual anamnesis foreshadow the advent of a more humanized medicine (Reginato et al., 2016). Moreover, most physicians recognize in the relevance of this practice and a considerable number of patients yearn for an approach that includes their spiritual needs (Ellis et al., 1999; McCord et al., 2004; Puchalski, 2006; D'Souza, 2007; Saad et al., 2015; Reginato et al., 2016).

The proposition 17: "Denying his/her own emotions and distancing from a patient's suffering is a defense strategy used by a physician" obtained agreement of 65.6% (**Table 11**). There was a statistically significant negative correlation between the year of graduation in which the student is and this proposition. As the student approaches his/her graduation, the agreement with the assertive one increases (**Table 13**). Some physicians, believing to be protecting themselves from suffering, create a barrier in their feelings and avoid seeing in the patient the fragility of the human being. It's a way they find not to look at their own mortality (Marta et al., 2009).

The proposition 18: "A good doctor should distance himself/herself from a patient's suffering" obtained 90.4% disagreement (**Table 11**). A statistically significant negative correlation was confirmed between organizational and intrinsic religiosities with this issue. The higher the organizational and intrinsic religiosities of the students, the lower the agreement with proposition 18 (**Table 13**). There were statistically significant negative correlations between propositions 14, 15, and 16 and this question. The higher the students agree with the related propositions, the lower the agreement with the assertive 18 (**Table 14**). As Kübler-Ross (2012) and Arantes (2016) advise us, a good doctor must learn to deal with empathy to be able to approach a patient without incorporating their pain. It is not an easy exercise, so they recommend the use of compassion, which

consists of respect, care, mindfulness, and closeness, without the damage that can be caused by empathy.

The last question of our data collection instrument turned to the academic context. The statement 19: "The proposition of didactic-pedagogical actions related to a patient's spiritual dimension in medical education is relevant" obtained 61.7% agreement. Only 11% of the students opposed these actions and 27.3% were indifferent (**Table 11**). There was greater agreement with this proposition among students who have religious affiliation, and lower among agnostics (**Table 12**). We found a statistically significant positive correlation between this proposition and DUREL, the higher the DUREL scores (OR, NOR and IR), the higher the degree of agreement of the students to this question (**Table 13**). We confirmed statistically significant positive correlations between the questions of the clinical context from 12 to 16 with proposition 19 of the academic context. The greater the students agree with the related propositions, the greater the agreement with this proposition (**Table 14**). There were statistically significant negative correlations between proposition 18 and this question. The higher the students agree with the related propositions, the lower the agreement with this assertive (**Table 14**). Corroborating our findings, Lucchetti et al. (2013b) found in their results that 61.6% of the students considered that a physician should be prepared to deal with spiritual issues related to their patients' health and 62.6% were in favor of including this content in the medical curriculum. In the result obtained by Mariotti et al. (2011), although more than 72% of the medical professors investigated agreed that faith or Spirituality could positively influence their patients' treatment, only 50% attributed importance to students' preparation for this approach during the medical program.

During the research, we scored some limitations in our study. Because it is a cross-sectional survey, the students were not followed up during the academic training to know if their opinion about the propositions related to the Spirituality/Religiosity of the patient in clinical practice would change over time. We used a standardized questionnaire developed for this study, which can be influenced by social desirability, moderating the students' responses, due to the social acceptability factor because they are inserted in a medical course. We included in our data collection instrument DUREL, which was designed to measure religiosity in Western religions and may be less accurate in its assessment of religiosity in Eastern religious traditions.

After these reflections, we will make some considerations regarding the conclusions of the research:

(1) Medical students attach significance to patient's spiritual dimension in clinical practice: 79.3% are favorable to a physician ask a patient about spiritual issues; 98.6% agree that, regardless of their religious belief, a physician should respect a patient's belief; 92.5% acknowledge that a physician's concern with a patient's spiritual dimension demonstrates empathy and improves doctor-patient relationship; 97.1% understand that a physician should consider a patient's emotional, sociocultural, and spiritual needs as well as their physical needs in the clinical practice. Although 12.4% of the students declared themselves atheists, this did not interfere in the high percentage of agreement with the questions related to the importance of spiritual anamnesis. Many professionals still stand to the conviction that medicine should remain secular and unrelated to Spirituality/Religiosity as this subject is considered coercive by some patients (Lucchetti et al., 2012b). Our research proved that the majority of EPM medical students attach importance to the spiritual dimension of the patient in clinical practice. Studies corroborate our results by proving that the mere fact that a physician is concerned about a patient's spiritual aspect can improve doctor-patient relationship and, consequently, the impact of performed medical interventions (Chibnall and Brooks, 2001; Peres et al., 2007; Berg et al., 2013; Lucchetti et al., 2013b; Reginato et al., 2016; Damiano et al., 2017).

(2) Students consider that caring for the patient's spiritual dimension is part of the comprehensive and humanized patient care: 83.7% agree that caring for the patient's spiritual dimension is part of the comprehensive and humanized patient care. Care for the spiritual dimension is the care of the "Spirituality/Religiosity of the patient" and should be used as a therapeutic resource in clinical practice through the taking of spiritual history (spiritual anamnesis) of the patient. A comprehensive and humanized patient care is aligned with the concept of total pain, proposed by Cicely Saunders, in 1967, which emphasizes the importance of interpreting the painful phenomenon not only in its physical dimension, but also in its emotional, social, and spiritual dimensions, affecting the genesis and expression of the painful complaint (Kübler-Ross, 2012; Arantes, 2016; D'Alessandro et al., 2020).

(3) The physician doesn't should distance himself/herself from a patient's suffering: 65.6% accept that the denial of their own emotions and the distancing from the patient's suffering is a defense strategy used by a physician; 90.4% disagree that a good doctor should distance themselves from a patient's suffering. According to Castelhano and Wahba (2019), the great challenge for most physicians is to recognize that it uses crystallized defensive attitudes that lead to an affective distancing from a patient. Associated with altruism, compassion is a fundamental tool for the exercise of medicine centered on a patient's integral care that implies the recognition and care of others' suffering, without sharing pain and without failing to look at oneself. All resources should be put into practice to alleviate a patient's suffering, but this should not occur in the detriment of self-care and self-preservation (Puchalski, 2001a, 2006; Kübler-Ross, 2012; Arantes, 2016; Reginato et al., 2016; D'Alessandro et al., 2020).

(4) Students are in favor of proposing didactic-pedagogical actions in medical education related to a patient's spiritual dimension: 61.7% of the study participants considered these actions relevant and only 11% were contrary to them. Despite the scarcity of validated educational models to incorporate Spirituality courses in medical education and the lack of a national guideline on what should be included in the curriculum for this area, we

should consider its importance and insertion as a discipline in medical schools in Brazil (Lucchetti et al., 2012b).

Our research object that proposes the insertion of the discipline of "Spirituality/Religiosity in clinical practice" in medical training in Brazil was anchored in relevant approval data in several countries. We verified the feasibility of incorporating Spirituality/Religiosity in clinical practice.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Research Ethics Committee/Federal University of São Paulo. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

This work was systematized by SB-A supported by her co-advisor LA and her advisor RT. All authors listed have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

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CORRECTION
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Corrigendum: Spirituality/Religiosity as a Therapeutic Resource in Clinical Practice: Conception of Undergraduate Medical Students of the Paulista School of Medicine (*Escola Paulista de Medicina*) - Federal University of São Paulo (*Universidade Federal de São Paulo*)

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A Corrigendum on

Spirituality/Religiosity as a Therapeutic Resource in Clinical Practice: Conception of Undergraduate Medical Students of the Paulista School of Medicine (*Escola Paulista de Medicina*) - Federal University of São Paulo (*Universidade Federal de São Paulo*)

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In the original article, there was an error in the text as published. The term "ciência da religião" was wrongly translated as "science of religion" and "cientista da religião" as "scientist of religion." The correct terms for English native speakers would be "study of religion" and "scholar of religion," respectively.

A correction has been made to *Discussion, Paragraphs 4, 5, and 6.* The corrected paragraphs are shown below.

Stern (2017) states that the differentiation between religion, religiosity and spirituality is very difficult to trace and points out several problems in the WHO definitions from the perspective of the scholar of religion. Initially, the definitions of religion and religiosity are based exclusively on the model of Abrahamic religions. By using the term "Spirituality," which would not necessarily relate to any religion, the WHO supports physicians to act in this field without hurting their codes of ethics but does not identify elements that can be only "spiritual," without being "religious."

The scientific literature presents a wide variety of works that deal with the inclusion of the Discipline of Spirituality and Religiosity in the medical curriculum. However, in pedagogical projects there is no specification of the most indicated professional category to coordinate this course and teach the classes. Stern (2018) believes that it is possible, with the application of concepts from the study of religion, to build professional bridges between study of religion and health

professionals. By the specific training in the theme and acquired skills, the scholar of religion has the most appropriate profile to train medical students in Spirituality/Religiosity.

We agree that academic training does not empower physicians, future teachers, to use the spiritual/religious context in clinical practice, therefore, they will not be able to transmit to their students a knowledge they do not have. It is necessary that a multidisciplinary team act, led by a scholar of religion, who can teach students the bases of religious traditions, so diverse in Brazil, so that when they receive, for example, a patient who is a Jehovah's Witness know that they will not be able to perform blood transfusion without authorization. In the prescription of medications, other religions have restrictions on substances, days of the week, schedules. The scholar of religion will be able to guide students on how to detect spiritual suffering and approach the patient about wanting to talk to the chaplain or, if not, with the religious leader of his religious belief. The doctor can work together with the scholar of religion to explain to the students how to proceed with the taking of spiritual history. Validated simple instruments, as FICA [F (Faith/belief)/I (Importance or influence)/C (Community)/A (Action in treatment)] (Puchalski and Romer, 2000) and HOPE [H (Sources of Hope)/O (Organized Religion)/P (Personal spirituality and practice)/E (Effects on medical treatment and terminal matters)] (Anandarajah and Hight, 2001), for example, can detect, in a matter of minutes, if the patient needs spiritual care, not for the doctor to treat him, but to refer him to the qualified professional.

The authors apologize for these errors and state that they do not change the scientific conclusions of the article in any way. The original article has been updated.

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When the Truth Is Out There: Counseling People Who Report Anomalous Experiences

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In this paper, we propose a clinical approach to the counseling of distressing subjective paranormal experiences, usually referred to as anomalous or exceptional experiences in the academic field. These experiences are reported by a large part of the population, yet most mental health practitioners have not received a specific training in listening constructively to these experiences. This seems all the more problematic since nearly one person in two find it difficult to integrate such experiences, which can be associated with different forms of psychological suffering. After having described briefly several clinical approaches already developed in this area, we outline the main aspects of clinical practice with people reporting exceptional experiences, in particular the characteristics of the clinician's attitude toward the narrative of unusual events. We then present the core components of a Psychodynamic Psychotherapy focused on Anomalous Experiences (PPAE) based on three main steps: phenomenological exploration, subjective inscription and subjective integration of the anomalous experience. Such an approach, based on a non-judgmental and open listening, favors the transformation of the ontological shock that often follows the anomalous experiences into a potential source of integration and psychological transformation.

Keywords: paranormal, anomalous experiences, psychotherapy, transliminality, ontological shock, spirituality

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CLINICAL APPROACHES TO ANOMALOUS EXPERIENCES

Experiences known or considered as paranormal in western culture – usually termed as anomalous or exceptional experiences in the academic field (Cardeña et al., 2014) – correspond to "experiences that are generally rare, spontaneous or provoked, involving from the subject's point of view a non-ordinary interaction with their environment. They generate intense emotions, positive or negative, stemming from their unusual and strange aspects" (Rabeyron et al., 2010; p.634). These experiences can more precisely be classified into ten categories from a phenomenological and anthropological point of view (Rabeyron and Loose, 2015).[1] Firstly, some of these experiences belong to a category involving an unusual "perceptive" interaction with the environment. Thus, during (1) *psi perceptions*, the person has the impression to

[1]This classification is close to the categories of the *Varieties of Anomalous Experiences* (Cardeña et al., 2014). Other classifications relying more on the underlying factors of these experiences have been proposed, especially a classification developed at the IGPP (for more details, see: Fach et al., 2013).

obtain information directly from another person (telepathy), at a distance (clairvoyance) or from the future (precognition); (2) In *vision and apparition experiences*, the presence of something or someone is perceived in a quasi-hallucinatory manner and is sometimes related to a real event (for example, the death of a relative at the same time as the apparition; Fenwick and Brayne, 2011); and (3) *Out of Body Experiences* (OBE) concern a change in body awareness and lead in particular to the feeling of being situated outside of one's body (McCreery and Claridge, 2002; Blanke and Dieguez, 2009).

From a more "projective" perspective, some people believe they can have a paranormal influence on their environment. This is especially the case in (4) *subjective psychokinesis experiences and poltergeists*, which usually involve the perceived ability to interact mentally with objects (Von Lucadou and Zahradnik, 2004) and (5) *magnetism or healing experiences*, which suppose inexplicable interactions between living being (Schmidt et al., 2004). A third category concerns "encounter" experiences in which people have the impression that they are in contact with "another world." This includes (6) *Near-Death Experiences* (NDE; van Lommel et al., 2001; Mobbs and Watt, 2011) occurring especially after comas or clinical death, and which some people (after "seeing," for example, a tunnel or deceased loved ones) interpret as being a journey in the afterlife (Parnia et al., 2014). A belief in life after death is also frequent in (7) *mediumistic experiences* which correspond to the alleged ability to communicate with the deceased (Taylor, 2005; Kamp et al., 2020; Elsaesser et al., 2021). In experiences of (8) *reincarnation*, the person, sometimes a child, experiment with, and believe in, past life memories (Stevenson, 1967; McNally, 2012); and (9) *Mystical experiences* can also be classified in this encounter category and correspond to an intense and global feeling of having "become one" with God or the universe. Finally, maybe the most surprising of these experiences are (10) the *abductions*, in which people are convinced that they have been abducted by aliens (Mack, 1994; Clancy et al., 2002).

Taken as a whole, approximately between one-third and half of the population reports at least one of these experiences during their lifetime[2] (Ross and Joshi, 1992; Cardeña et al., 2014) and it is common for the same person to report several of them. Accordingly, it seems appropriate to approach and conceptualize these experiences holistically, both from a clinical and a theoretical perspective as is attempted in this paper. Several of these experiences, especially mystical experiences, have also been frequently interpreted, or even induced, by religious settings (Kripal, 2010). They are currently developing in western societies, in the context of a decrease in the influence of religions, where worldviews are more influenced by scientific and technical representations. They also frequently implicate a spiritual dimension which has been studied in particular by the field of transpersonal psychology (Tart, 2009). In this regard, Grof and Grof (1989) has proposed to consider these experiences as "spiritual emergencies," which underlines their traumatic aspect but also their transformational potential (Kennedy et al., 1994; Ruttenberg, 2000; Palmer and Hastings, 2013).

Recent advances in several domains have provided a better understanding of these experiences. A lot of research on this topic has indeed been published in the fields of psychiatry (Lomax et al., 2011; Kamp et al., 2020), clinical psychology (Kramer et al., 2012; Roe, 2020), psychoanalysis (Eshel, 2006; Brottman, 2011; de Peyer, 2014; Si Ahmed, 2014; Reichbart, 2018), and cognitive neurosciences (Brugger and Mohr, 2008; Krippner and Friedman, 2009). A more specific approach to these experiences has also been developed by anomalistic psychology (Holt et al., 2012; French and Stone, 2013; Cardeña et al., 2014) and psi studies (Radin, 2000; Cardeña et al., 2015; Cardeña, 2018). These different lines of research, developing in complementary areas, underline that these experiences happen to people of all ages, regardless of their gender, their education, or their culture.

We will center our attention in this paper on the clinical approach of anomalous experiences. If nearly half of the persons affected consider these experiences as being pleasant, or even seek them out, the other half develop different forms of psychological and somatic suffering following them (Landolt et al., 2014; Rabeyron, 2020). Nevertheless, these experiences cannot be reduced to psychopathology, and as will be described with more details later, the relationships between anomalous experiences and mental disorders are complex and vary considerably from one person to another (Goulding, 2004a,b; Schofield and Claridge, 2007; Simmonds-Moore, 2012; Evrard, 2013). Moreover, these experiences are frequently associated with traumatic experiences, especially during childhood (Irwin, 1996), and share several characteristics with traumatic reliving as illustrated in particular by abductions (McNally et al., 2004).

The potential suffering related to these experiences can also be increased by the difficulty in talking about them due to the fear of being considered weird or crazy by relatives or medical staff (Wilde and Murray, 2010; Roxburgh and Evenden, 2016a,b). Indeed, certain aspects of these experiences suggest indeed interactions with the environment which deviate from the dominant representation of reality in western culture. Cardeña et al. (2014) have insisted on this aspect by defining anomalous experiences as "uncommon experiences (e.g., synesthesia), or those that, although they may be experienced by a significant number of persons, are believed to deviate from ordinary experience or from the usually accepted explanations of reality according to Western mainstream science" (p. 4). Consequently, many people prefer not to speak about their anomalous experiences and feel a form of culpability, or even shame, toward intimate experiences they prefer to keep secret due to their fear of not being understood.

This fear is not totally irrelevant given that most of the clinicians have not received a specific training in this domain. Thus, in a study conducted in Netherlands with 640 mental health practitioners (Corbeau, 2004), nearly half of them responded that their patients reported anomalous experiences, but four out of five of these clinicians also reported a lack

[2]There are nevertheless large differences in the frequencies of these experiences. For example, psi experiences are far more frequent than abduction or reincarnation experiences. More details about this topic in particular in: Cardeña et al. (2014) and Rabeyron (2020, p. 19).

of information about this topic. Similarly, academic researchers in the field of anomalous experiences report that they are ill-equipped to deal with the psychological distress that negative experiences of this kind can produce (Coelho et al., 2008). Anomalous experiences can challenge clinicians and academic researchers with narratives that may contradict their own conception of reality (Roxburgh and Evenden, 2016a). These experiences can then induce an "ontological shock" (Mack, 1994) in those who report them, but also in those who listen to them, due to a discrepancy between the reality as it was perceived before the experience and as it appeared afterward.

Consequently, specific psychological care is necessary to help people share these experiences and, more generally, we will describe how clinicians may accompany, and sympathetically support, their patients when they report such experiences. In this perspective, after a brief overview of the clinical traditions in this field, we will describe the approaches of the main counseling centers specializing in this domain. We will present in particular the approach developed at the *Center for Information, Research and Counselling about Exceptional Experiences* (CIRCEE) before proposing the main components of a Psychodynamic Psychotherapy focused on Anomalous Experiences (PPAE).

CLINICAL SETTINGS IN THE FIELD OF ANOMALOUS EXPERIENCES

There is a limited but quite long tradition of thinking about clinical counseling of anomalous experiences. It began at the end of the 19th century in the *Society for Psychical Research* in London, the *American Society for Psychical Research* in Cambridge, Massachusetts, and the *Institut Métapsychique International* in Paris. These societies were collecting these experiences in order to improve the understanding of their phenomenology (Gurney et al., 1886). It was a first step toward a clinical approach in this domain by shedding light on the necessity to account for the existence of such human experiences. A more clinical approach was developed in psychoanalytical circles who have expressed an interest in these experiences from their outset, in particular with the seminal writings of Freud, Ferenczi, and Jung about telepathy and occultism (Rabeyron et al., 2020). At this time, psychoanalysts were particularly interested in the spontaneous occurrences of telepathic phenomena shared with their analysands and catalyzed by the regression induced by the psychoanalytical setting. Other psychoanalysts have then continued to work on this topic – in particular Devereux (1953), Ehrenwald (1971), Eisenbud (1946), Servadio (1935), and Ullman (1973) – and have proposed a wider understanding of the relationships between the unconscious and these experiences.[3] More recently, since the early 2000s, interest in psychoanalytic circles has been growing toward the clinical aspects of anomalous experiences, especially in the United States, with analysts like Mayer (2001, 2007), Eshel (2006, 2010, 2013), Totton (2003), de Peyer (2014, 2016), and Reichbart (2018).[4] For example, Mayer (2007) explained that she "gradually had to face the realization that there were things my patients had been only half-telling me for years, things they viewed as too weird or too risky to reveal for fear that I would not believe them or – worse –would think they really were crazy" (p. 7). Consequently, these analysts question how they could, and should, be able to listen to and understand such experiences when they are reported by their analysands.

Coincident with these writings from psychoanalysts, a psychotherapeutic approach of anomalous experiences has been developed in several European countries since the 1960s.[5] In Germany, such an approach has been developed initially by Hans Bender at the *Institut für Grenzgebiete der Psychologie und Psychohygiene* (IGPP; Bauer, 2004), in France by Hubert Larcher (Evrard, 2008) at the *Institut Métapsychique International* whose work has been pursued by the clinical psychologist and psychoanalyst Si Ahmed (2014). In Scotland, a clinic counseling service was offered with the foundation of the *Koestler Parapsychology Unit* at Edinburgh University whose main approach was based on cognitive behavior therapy with some multi-modal additions (Tierney, 2012). These first counseling services can be considered as the premise of what has been called "clinical parapsychology" (Evrard, 2007) and whose main objective is to help people to understand and cope with these experiences. In the 1980s, a few clinicians thus started to specialize in this domain and several colloquia were held about the links between clinical practice and anomalous experiences. For example, a conference has been organized about spontaneous psi cases at the University of Berkeley, in 1987, followed by a symposium entitled "psi and clinical practice" in 1989, at London, whose contributions led to a classic book in the field (Coly and McMahon, 1989).[6]

The publication of the *Varieties of Anomalous Experience* by the *American Psychological Association* (APA), in 2000, republished in 2014, has also been a founding step in this domain and represents an excellent synthesis of knowledge about anomalous experiences. The community of clinicians working on this topic has then gradually grown since the 2000s, which resulted in the first meeting of international experts on anomalous experiences in 2007, at Naarden, in Netherlands. Some of the interventions during this meeting led to a collective work intended to be a guide for clinicians confronted with these experiences (Kramer et al., 2012). Two years later, in 2009, the first conference on "Mental Health and Exceptional Experiences" was held at the University of Liverpool Hope (Simmonds-Moore, 2012). The

[3]This interface between psychical sciences and psychoanalysis led to a symposium coined "psi and psychoanalysis" at the first international congress of parapsychology, at Utrecht, in 1953.

[4]An annual symposium on this topic is proposed each year at the congress of the *American Psychoanalytical Association* in New York.

[5]Also, in the United States, for a recent and original theoretical framework about psi experiences relying notably on a clinical point of view, see the work of Carpenter (2012).

[6]In 1995, a symposium was also organized by the *Parapsychological Association* as part of its annual convention on therapeutic strategies concerning anomalous experiences.

aim of these different events was to bring together clinicians specialized in this field in order to share research and improve the quality of clinical approaches.

Currently, the main center specialized in this domain is the IGPP founded in Freiburg im Breisgau, Germany, in 1950 by Hans Bender, already mentioned, who was a medical doctor and a professor of psychology. The IGPP counseling was initially set up in collaboration with the Institute of Psychology of the University of Freiburg in 1996 (Bauer, 2004). A specific system for documenting anomalous experiences (DOKU) and a phenomenological questionnaire (PAGE; Belz-Merk, 2000; Landolt et al., 2014) have been developed there to better understand these experiences (Fach et al., 2013; Landolt et al., 2014). This institute receives about 2000 requests per year with an average of five contacts per request, i.e., an annual active file of about 500 people. Up to four clinical psychologists have worked part-time in this counseling service and the IGPP offers specific training courses recognized by the *Order of German Psychologists*.

A second organization specialized in this topic, also in Germany, is the *Scientific Society for the Advancement of Parapsychology* (*Wissenschaftliche Gesellschaft zur Förderung der Parapsychologie*), founded in Germany, in 1981, by Johannes Mischo, who was then Hans Bender's successor to the chair of psychology and border areas of psychology at the University of Freiburg. Since 1989, particularly in response to a wave of interest in the paranormal among young Germans, the WGFP has taken a clinical orientation by developing a counseling service in the same city as the IGPP in Freiburg im Bregsau (Zahradnik, 2007). Directed by the clinical psychologist and physicist Walter Von Lucadou (1995), it has been recognized as a public utility and financed by the German government since 1991. Von Lucadou has published numerous articles and books based on data collected within the WGFP using mainly a systemic approach. His work is known for its originality from a theoretical point of view (with the Pragmatic Information Model; Von Lucadou, 1995) and for his long experience in the field of poltergeist cases (Von Lucadou and Zahradnik, 2004).

Following the example of the clinical settings developed in Germany, we have created,[7] in 2009 in France, a teletherapy counseling service specialized in anomalous experiences: the Center for Information, Research and Counselling about Exceptional Experiences (CIRCEE, *Centre d'Information de Recherche et de Consultation sur les Expériences Exceptionnelles*). Before describing the main counseling aspects of anomalous experiences, a few words seem necessary to describe CIRCEE which is also a network that brings together French researchers and clinicians interested in anomalous experiences (psychologists, psychiatrists, philosophers, neuroscientists, etc.). The center has a Web site (www.circee.org) and most of its activity comes from its counseling service, composed currently of two clinical psychologists (working part time) and a supervisor. Since its opening in September 2009, CIRCEE has been contacted by about a thousand people and psychological counseling has been conducted with more than 750 people. More precisely, over the last 5 years – from March 2016 to March 2021 – 450 therapies have been carried out, i.e., nearly 90 therapies per year. The duration of these therapies is variable but rarely exceeds 15 sessions (45 min, weekly frequency).

Patients generally contact CIRCEE after searching the Internet about their paranormal experiences or are referred by medical doctors and clinical psychologists who have heard about the counseling service. Almost all the sessions are carried out by teletherapy (phone or zoom)[8] since we are contacted by people who live in all parts of France and in French-speaking countries (Switzerland, Belgium, Quebec, etc.).[9] While there might be reasons for concern that teletherapy could hinder the quality of the clinical encounter, we found, after more than 10 years of clinical practice with such an approach, that it presents as many advantages as disadvantages[10] as confirmed recently by the development of teletherapy in other fields (e.g., teletherapy for post-traumatic stress disorder; Turgoose et al., 2018), especially since the COVID-19 crisis (Burgoyne and Cohn, 2020).

The first session usually permits to exchange with the persons about their expectations and is an opportunity for a first global description of the anomalous experiences. We also explain during this first interview how we work[11] and what the person can expect from us. Different outcomes are possible after this first session: (1) For about half of the cases, this session is sufficient for people who find satisfactory answers to their questions about anomalous experiences and who do not wish to engage in a more in-depth analysis; (2) More rarely, the persons expectations or situation are at odds with what we propose. For example, some people might be looking for someone who could help them to develop or improve their paranormal abilities. We are also sometimes confronted with patients who are clearly describing a psychotic breakdown, with hallucinations and delirium, rather than

[7]With Renaud Evrard – a clinical psychologist specialized in anomalous experiences and an associate professor in clinical psychology – and David Acunzo, a neuroscientist doing research in the field of anomalous experiences after a PhD at Edinburgh university.

[8]A PhD has been conducted at the IGPP on the particularities of this type of practice in the field of anomalous experiences (Fangmeier, 1999).

[9]The main exception concerns a few cases in which the sessions have been conducted at the home of the patients, which is sometimes necessary, especially for poltergeist cases. For the description of such a case, see, for example, Rabeyron (2020, p. 99).

[10]When using the phone, we do not have access to the patient's non-verbal behavior (unless we use Zoom) which can be relevant for clinical evaluation, but we usually gain in ease of expression. Furthermore, the phone reduces the impact of the therapist demeanor which sometimes affects defense mechanisms that are frequently associated with anomalous experiences. It also allows the clinical psychologist not being in visual contact with the patient during the session which might favor free association.

[11]The person first sends a short description of the anomalous experiences by using an online form on the CIRCEE Web site. We then contact the person by email to propose a first session by phone or Zoom. At the beginning of this first session, we explain to the patient that we are clinical psychologists specialized in anomalous experiences and that we are here to understand their experiences with an open and non-judgmental approach. At the end of this first session, depending on the demand of the patient, we discuss the need and the relevance of other sessions.

an anomalous experience *per se*.[12] In this type of situation, we usually suggest to the patient a reorientation toward a psychiatrist for a medical evaluation;[13] (3) The patients are looking for a more in-depth understanding of the psychological dynamics associated with their experiences, which is usually the case when these experiences are a source of suffering. These experiences may also appear as some kind of "anomaly" or "enigma" that the person needs to better understand, opening the way for a psychological work focused initially on the anomalous experiences.

SPECIFICITIES OF THE CLINICAL PRACTICE IN THE FIELD OF ANOMALOUS EXPERIENCES

Before further describing the details of the psychological support proposed in the counseling service, it seems relevant to evoke briefly the type of knowledge and the clinical attitude necessary when dealing with people describing anomalous experiences as illustrated in the left circle of **Figure 1**.

First of all, knowledge about psychopathology is useful in order to better understand the complex relationships between anomalous experiences and psychopathology (Tierney, 1993; Wallon, 1994; Evrard, 2013, 2014). In this regard, anomalous experiences have long been a topic of debate concerning the distinction between the normal and the pathological (Evrard, 2014). Overall, the current literature shows that anomalous experiences cannot be systematically

[12]Like other counseling services of this type, we are indeed contacted by people who present prodromal symptoms of psychotic disorders, especially paranoid schizophrenia. These patients usually interpret manifestations of their disorders (unusual perceptions, hallucinations, influence syndrome, cognitive distortions, etc.) as having a paranormal source. The number of sessions with these patients is usually limited as they are often disappointed that we cannot confirm their paranormal abilities. Moreover, our clinical setting is most of time not suitable for such patients for whom psychiatric care, medication and hospitalization may be necessary.

[13]A patient might be experiencing a psychotic breakdown and have, at the same time, anomalous experiences. When the patient is able to describe these experiences and that we evaluate that the clinical setting of CIRCEE is safe for the patient, we may propose other sessions.

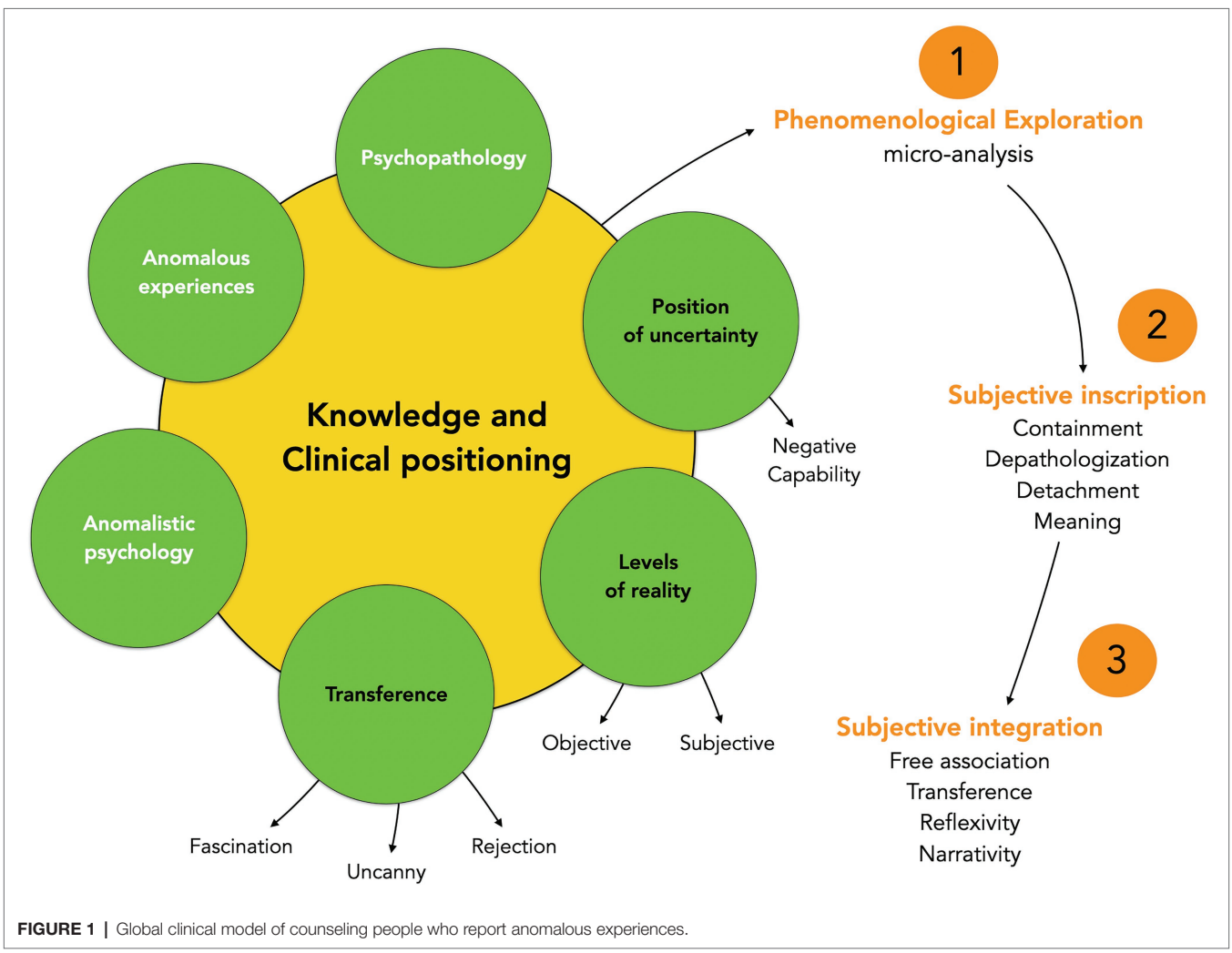

FIGURE 1 | Global clinical model of counseling people who report anomalous experiences.

associated with psychopathology (Goulding, 2004a,b, 2005; Kerns et al., 2014). More precisely, several studies have shown a possible link between paranormal beliefs, magic thinking, and bipolar disorders (Eckbald and Chapman, 1983). People who believe in paranormal also present higher scores for hypomania and a negative relationship has been reported between belief in the paranormal and psychological coping (Irwin, 1991). Moreover, more specific psychopathological condition, like depression, have been correlated with certain exceptional experience, especially mystical experiences (Thalbourne, 1991). On the other hand, other research has failed to find a link between anomalous experiences and mental disorders (Reinsel, 2003; Goulding, 2004a,b). For example, there is no clear link between paranormal experiences and depression in other studies (Windholz and Diamant, 1974) and several studies have shown that anomalous experiences might improve mental health, wellbeing, and personal growth (Kennedy et al., 1994; Kennedy and Kanthamani, 1995).

Studies about psychopathology and anomalous experiences thus lead to contradictory results. This is particularly visible in the studies about schizotypy,[14] a multidimensional factor of personality used to measure a tendance to psychosis (Claridge, 1997). Several researchers have indeed shown a possible link between schizotypy and anomalous experiences (Schofield and Claridge, 2007). Schizotypy is then considered, in the quasi-dimensional model (Meehl, 1990), as the expression of a mental disorder associated with anomalous experiences. But people who report such experiences usually have high levels on scales measuring unusual beliefs and perceptions, but also report low score on negative symptoms scales. Consequently, the notion of "healthy schizotype" has been proposed (McCreery and Claridge, 2002; Goulding, 2005; Mohr and Claridge, 2015) and a total model of schizotypy has been developed. In this model, people can report high scores on schizotypy scales without suffering from mental disorders and people who report anomalous experiences could then be considered as "happy schizotypes."

Clinical practice with people reporting such experiences underline the high diversity of configurations between anomalous experiences and psychopathology. This relationship cannot be easily reduced to a binary distinction between "normal or pathological" and probably that most screening scales for mental health and personality traits cannot render precisely the complexity of this relationship, explaining the contradictory results mentioned previously. This complexity also explains why it can be difficult for a clinician to differentiate precisely what is an anomalous experience and what is psychopathological, which can lead to misdiagnoses for clinicians who are not specialized in this domain (for example, a classical mistake is to prescribe an antipsychotic for the "treatment" of an anomalous experience).[15] Mental health aspects associated with anomalous experiences are actually very diverse and depends on many factors (the type of anomalous experience, the personal situation of the person, the psychological structure,[16] etc.). We can more precisely discriminate in particular six configurations concerning the relationship between anomalous experiences and psychopathology as illustrated in **Figure 2**. Only a detailed clinical analysis, on a case-by-case basis, can then provide a relevant analysis of the relationship between anomalous experiences and psychopathology.

Beyond these psychopathological aspects, a knowledge of the phenomenology of anomalous experiences is also useful even if it is not necessary to have had such an experience oneself. The clinician has to be able to construct a precise representation, and understanding, of the patient's experience and should have a global knowledge of the notions, beliefs, books, known figures in the field of the paranormal. From this point of view, clinical work in this domain shares characteristics with ethnopsychiatry, as the paranormal acts as some kind of parallel world to the mainstream culture, as illustrated by the case of Paulette.[17] This woman, in her sixties, contacted the counseling service because she was disturbed by voices that she heard on a daily basis. After losing a child when she was younger, she and her husband became interested in the paranormal and survival of life after death. They had been working with mediums in order to contact their deceased child using electronic devices. Paulette had no idea that she was going to "open a door" on her "psychic abilities." Indeed, after a few months, she began to hear voices that she initially liked because they spoke to her about her family and reminded her about nice events. However, other voices that were more disturbing started to appear as well as strange phenomena in her home. Paulette and her husband observed unexplained movement of objects and strange behavior of household appliances. She then tried to alleviate her anxieties through relaxation and the use of an electronic device for "magnetism." The seers, healers, and magnetizers she asked to help her mentioned that she was "affected by the lower astral."

The voices began gradually to "get on the household appliances" and became more and more intrusive, which finally led Paulette to several hospitalizations. Psychiatrists then tell her that she was severely depressed and prescribed

[14]See also the debates about the attenuated psychosis syndrome (Evrard and Rabeyron, 2012).

[15]This does not mean that experiences interpreted as being paranormal cannot be associated with mental disorders. For example, and as already mentioned, many patients suffering from schizophrenia have delirium concerning telepathy and influence syndrome. But it is important to not reduce all telepathic processes to this specific psychiatric condition.

[16]Using a psychoanalytical approach, we also usually take into account the predominant psychological structure of the person. There are three main structures in psychoanalytical models (neurosis, borderline, and psychosis) and the expression of the anomalous experiences will vary with these structures that can be discriminate with specific factors. For more details about these factors, see: Bergeret (1985), Maleval and Charraud (2003), Evrard (2014), and Rabeyron (2020, p. 127).

[17]Clinical case material presented in this paper has been disguised in a manner than none of the patients might be recognizable. The case of Paulette has been collected by one of the clinical psychologists of CIRCEE (Samuel Caussié). All the other clinical cases have been collected by the author of this paper.

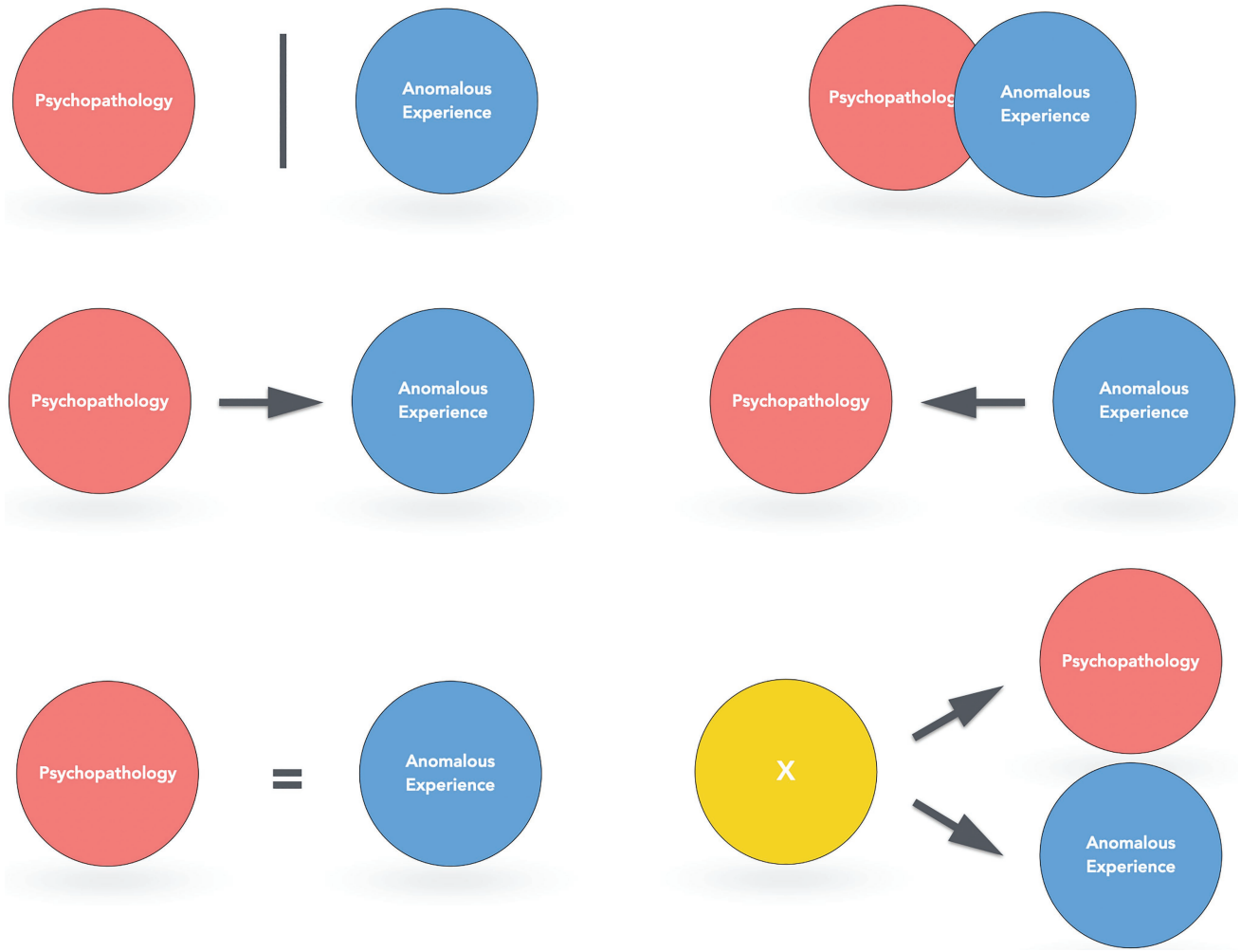

FIGURE 2 | Six configurations of the relationship between anomalous experiences and psychopathology: (1) no apparent relationship between these two domains (e.g., a precognitive dream without psychopathology); (2) the anomalous experience is induced by psychopathological aspects (e.g., depression and anxiety might favor the emergence of an anomalous experience); (3) what is reported as an anomalous experience is actually a mental disorder (e.g., delirium about telepathic abilities in schizophrenia); (4) psychopathology and anomalous experiences are overlapped and they cannot easily be distinguished (e.g., certain mystical experiences during maniac episodes); (5) the anomalous experience induces psychopathology (e.g., PTSD after an abduction); and (6) another common factor favors the emergence of anomalous experiences and psychopathology (e.g., thin mental boundaries or a tendency to dissociation).

medication, which according to Paulette was not very helpful. She finally chose to stop these treatments even though she continued to see her psychiatrist regularly. The "world of the paranormal," described by people like Paulette, is composed of symbols, personalities, places, and rituals that the clinician has to know about in order to improve the therapeutic alliance and the feeling of the patient that she or he is being understood. These people frequently follow a path that combines Western medicine and alternative practices (Kessler-Bilthauer and Evrard, 2018). It is therefore fairly common to see these patients after the psychiatrist, the psychologist, the hypnotist, the healer, the seer, and the exorcist who have already proposed different explanations for these experiences and how to interpret them.

Anomalistic psychology is also a useful area of knowledge to improve the understanding of the factors which may contribute to the emergence of anomalous experiences (Holt et al., 2012; French and Stone, 2013), especially the personality traits and related psychological factors (false memories, cognitive illusions, etc.) frequently associated with them (psychic permeability, fantasy-prone personality, trauma, etc.). Case studies and experimental psi research are also a useful resource concerning the more objective aspects of these experiences (Radin, 2000; Irwin and Watt, 2007; Cardeña, 2018). These different perspectives contribute to a global theoretical framework that guides the clinician's listening. This may even sometimes concern very concrete elements. For example, the malfunction of certain household appliances – alarm clocks, microwaves, television, etc. – could induce electromagnetic waves that promote the occurrence of hallucinatory processes (French et al., 2008). The same is true for certain molds, such as *stachybotrys chartarum*, which are sometimes found in places considered

as being haunted (Belkin, 2001). In some poltergeist cases, it may also be relevant to determine the source of certain noises, a classic example being the footsteps reported in the attic which are sometimes created by animals (owls, rodents, etc.) or movements in building structures due to ambient temperature change (for other factors associated with "haunted houses," see Dagnall et al., 2020).

Beyond these three domains of expertise (psychopathology, phenomenology of anomalous experiences, and anomalistic psychology), clinical observation and clinical attitude rely on the basic ingredients of any clinical practice. Some facets of the therapeutic relationship might nevertheless be pushed to the extreme in this field, in particular transferential dynamic – the mutual and unconscious psychological influence of the patient on the therapist (Levy and Scala, 2012)[18] – is often intense and induce reactions of fascination and rejection. Fascination because the reported situations may induce effects of sideration echoing the psychological functioning of the patient.[19] On the contrary, rejection can take the form of disinterest, disqualification, and even irony toward the incongruity of some of these experiences. These reactions of fascination and rejection are often associated with strange feelings – more precisely what is called the "uncanny" in psychoanalysis (Allik, 2003) – due to the confrontation to the "unknown" or the "extraordinary" as illustrated by the situation of Maurice.

Maurice, a scientist in his sixties, lived through several spontaneous psychokinesis experiences which greatly disturbed him because they seemed irreconcilable with his scientific training. He described during the sessions a strange phenomenon that occurred during a scientific seminar. He was thinking about his son, worried about difficulties he encountered with him, when he found the key of his hotel room totally twisted on a table. A similar anecdote had happened to him previously with the discovery of a nail standing upright on a table at his home. He recounted with more details another experience that troubled him greatly. While enjoying a vacation with his family, Maurice took several pictures with a Polaroid camera he had just acquired. He was then in a "strange state," thinking about a recently deceased uncle. While wondering if this uncle could see him from where he was, Maurice took a picture that profoundly upset him and his family: the picture, of his daughter, included a form in a mirror that looked like his uncle, a cigarette in his mouth, with a familiar expression. Maurice was fascinated by this picture and his father also found a striking resemblance with Maurice's uncle, while his wife has been so scared by this supposed "paranormal photography" that she totally rejected it and eventually burned it.

Maurice could not to show this photography since it has been burned, but it is not uncommon for other patients to show photos and audio or video recording of supposed paranormal events. The usual implicit questioning from the patient is the following: "What I have experienced is real and I can prove it. Do you believe me now?." Given that a clinical psychologist, especially in psychodynamic therapies, is supposed to be interested in everything the patient can say or show (Chouvier and Attigui, 2012), we take a look at all the "paranormal stuff" that might be proposed by the patient. We choose not to ignore this type of questioning about the reality of the events and we take into account all the different elements the persons want to share with us. Moreover, this initial step about the "objective" aspects of the experience seems necessary before the patient is able to explore the more "subjective" dimensions of the anomalous experience. The aspect is particularly important given that psychological processes are metaphorically "projected" on these objects that can be considered as a "medium" or an "interface" with the unconscious, in the same manner that a dream or a work of art can be analyzed. This can also lead to sometimes propose possible explanations concerning certain "paranormal photography" (e.g., dust, optical illusion, and flash effects). The same is true, for example, for more specific experiences like sleep paralysis[20] for which a little information given by the clinician can make a big difference for patients frightened by what they are experiencing.

We also rely on a position of "undecidability" as proposed initially by Georges Devereux (1953) in the field of ethnopsychoanalysis. This undecidability means that the clinician has to suspend the judgment concerning the ontological dimension of the paranormal experiences. This attitude implies, for both the patient and the clinician, a "negative capability" which correspond to the capacity to tolerate doubt and uncertainty (Bion, 1965). For example, when a person considers a dream to be of a premonitory nature or describe an alien abduction experience, although the "objective" nature of the experience may be discussed, we try to not reduce the experience to what the clinician might say or think about it. Devereux (1953) explained this attitude about psi in these terms: "This is the most satisfying scientific attitude in the current state of our knowledge, but it does not simply require intellectual ingenuity in unveiling the logical characteristics that explain the nature of the link, but also a formidable capacity to tolerate frustration" (p. 32). So, even if we discuss with the patient the objective or ontological dimension of the anomalous experiences, our aim is mainly to help the patient to construct his or her own representation of the experience. This attitude seems the most appropriate as it offers a "non-judgmental space" in which the person can elaborate the meaning associated with the anomalous experience (Roxburgh and Evenden, 2016a,b). Indeed, if the clinician expresses "too much" interest in the reality of the

[18]In psychoanalytical therapies, transference describes more precisely how the patient has an unconscious tendency to project feelings, desires, and expectations from past relationship to the current relation with the therapist. The transference is both a tool for understanding the patient's psychic life and a leverage for the therapeutic process.

[19]For example, after listening to the description of a Near-Death Experience, the clinician might "share" with the patient, for a few moments, the absence of fear concerning after life due to the force of the impact of such an experience on the psyche (Rabeyron and Bergs, 2020). At the opposite, some experiences like abductions, can be very disturbing, in the same manner, induce a strong feeling of uncanny in the clinician mind. For an example of such a clinical case, see for example: Rabeyron, 2018.

[20]"Sleep paralysis involves a period of time at either sleep onset or upon awakening from sleep during which voluntary muscle movements are inhibited" (Denis et al., 2018, p. 1).

phenomena, he risks being fascinated by the experiences and will not be able to help the patient be more objective about the potential meaning of the experience. The clinician has to be very careful from this point of view because the patients are often trying, consciously or unconsciously, to push the clinician toward a "validation" of the reality of the experience. On the other hand, if the clinician is not interested in the reality of the experiences (and, more precisely, thinks *a priori* that these experiences are impossible), the patient will be frustrated and have the feeling that the therapist is not interested in some part of his or her intimate experience (Roxburgh and Evenden, 2016a,b).

This attitude of undecidability is relatively simple to understand, but not always easy to apply in practice when we encounter situations in which we cannot understand precisely what happened to the person as illustrated by the following situation. Augustine, in her twenties, contacted the counseling service to describe an experience she had a few years ago and which she had recently discussed with the friend who was with her that day. They had gone for a walk in the woods at a picturesque site near an abbey, at a crossroads that they used to call the "no man's land" because it was on private property. They suddenly saw "lights" and feared that it was forest rangers. They decided to get back in their car and then saw, for the duration of one minute, these lights passing in front of them. These lights were a few dozen centimeters long and appeared as "white pellets" passing over the road at a human height. Augustine thought that these lights might be related to the fact that people had been shot there during World War II. Two years later, Augustine – who had not opened up to anyone until then about this – decided to speak about this experience with her mother. The latter told her that she had a similar experience, when she was her age, in the same woods, and in a car with Augustine's father.[21] This narrative is a good example of "apparitions" or "visions" in which several people are involved. They are usually very disturbing for those who report them and it is often complicated to understand precisely what happened. In this regard, the clinician has to be able to handle his own frustration to not understand the nature of some of these experiences.

[21]In this type of situation, and as will be described later, we first listen with attention to the experience with a non-judgmental stance and by using micro-phenomenology technics. Such an approach helps the person to "re-process" the experience, even if it was not traumatic one for Augustine. It was rather some kind of anomaly that she was not able to understand, something "impossible" that happened to her. Then, we have tried to understand how Augustine was interpretating this experience in order to have a more global view of the "subjective context" of the anomalous experience. Two sessions have finally been conducted with Augustine who was not interested in doing more sessions. From a psychodynamic point of view, we had not been able to understand precisely the potential "function" of this experience. Neither did we have an "objective" explanation for what Augustine saw that night. But, sometimes, what is the most important is not that the patient has found an explanation or the meaning of the experience but rather that he or she has met someone that could listen with openness and attention to their experience. This is maybe what is the most therapeutic in the field of counseling of anomalous experiences.

PSYCHODYNAMIC PSYCHOTHERAPY OF ANOMALOUS EXPERIENCES

We are now going to describe more precisely how we work with people reporting anomalous experiences by proposing a model of psychotherapy – the Psychodynamic Psychotherapy of Anomalous Experiences (PPAE) – whose main principles, summarized in the right part of **Figure 1**, will be explained below. PPAE relies mainly on a psychodynamic approach which is described by Shedler (2010) as "a range of treatments based on psychoanalytic concepts and methods that involve less frequent meetings and may be considerably briefer than psychoanalysis proper. Session frequency is typically once or twice per week, and the treatment may be either time limited or open-ended. The essence of psychodynamic therapy is exploring those aspects of self that are not fully known, especially as they are manifested and potentially influenced in the therapy relationship" (p. 98). More precisely, Blagys and Hilsenroth (2000) have described the seven most classical characteristics of psychodynamic therapies: (1) focus on affect and expression of emotion; (2) exploration of attempts to avoid distressing thoughts and feelings; (3) identification of recurring themes and patterns; (4) discussion of past experience; (5) focus on interpersonal relations; (6) focus on therapy relationship; and (7) Exploration of fantasy life. The same principles are used in PPAE but are more focused on the anomalous experiences and the feelings associated with them.

When necessary, we can also use other psychotherapeutic approaches, in particular a phenomenological approach as explained below. Indeed, the counseling of anomalous experiences, like many other clinical practices, frequently leads to theoretical and clinical integration of different techniques or theories in order to adapt as closely as possible to the situation of the patient.[22] More specifically, we do not follow an interview grid given that the psychodynamic approach is founded on a non-directive stance allowing to follow more precisely the free associations of the patient (Rabeyron and Massicotte, 2020). Nevertheless, we can identify three main "steps" in most of the work done with the patients: (1) phenomenological exploration (how the patient describes the experience?), (2) the subjective inscription of the experience (how the patient "feels" the experience?), and (3) the subjective integration of the experience (how the patient understands the experience). We are now going to describe the main aspects of these three steps even if their length and their evolution might vary considerably from one person to another.

Phenomenological Exploration of the Anomalous Experience: Description of the Experience

An initial phenomenological description of the experience is often relevant during the first session. The aim is to encourage the

[22]The technique or the theory used by the clinician is probably less important than common factors in psychotherapy as shown by many studies in the evaluation of psychotherapy (Cuijpers et al., 2019). This is probably also true for the counseling of anomalous experiences.

person toward an "embodied" account of the anomalous experience in a state which permits her/his to "re-experience" it from a first-person point of view (Depraz, 2014). This phenomenological exploration is also intended to help the person to get back at a sensorial and emotional level. Several methods exist to explore the phenomenological aspects of an experience and we use in particular a technique called "cognitive analysis" (Finkel, 2017) or "micro-analysis" (Rabeyron and Finkel, 2020b). This method is at the crossroad of several theories and fields of research, based on methods inspired by phenomenology (Giorgi and Giorgi, 2003) as well as introspective psychologists, like Binet, of the late nineteenth century. This method has also a number of similarities with explanatory interviews (Vermersch, 2012) and micro-phenomenology[23] (Petitmengin and Bitbol, 2009; Bitbol and Petitmengin, 2017; Petitmengin et al., 2018), and induces a state which shares characteristics with hypnosis (Roustang, 2003; Erickson et al., 2006) and EMDR (Tarquinio et al., 2017).

If a patient is asked to describe a near-death experience, she or he might evoke the impression of having been through a tunnel at the end of which a light was perceived. This description is mainly expressed in a symbolic manner given that the patient is presenting a verbal description of the experience from memories. However, this description is a reduced and approximate account of what really happened from a subjective point of view. And the clinician also constructs an approximate representation of the patient's experience taking the form of the representation of the tunnel described by the patient. An interview using micro-analysis leads the patient to a state of "evocation" helping him to "re-experience" the initial state at a sensory and emotional level, thus leading to a more detailed, and reliable, description of the anomalous experience. In this manner, the clinician obtains a very precise account of the experience which seems closer to what the patient has really experienced.

In order to induce this state, the person is invited first to return to the beginning or shortly before the experience ("Can you describe where you are just before the experience?"). Phenomenological questions will then be asked to guide the patient: "What do you see? What do you hear? What do you feel?." These questions are asked in the present tense and are intended to "warm up" the memories of the experience. They are presented in terms of "how" and not "why," so as to facilitate a concrete re-experiencing rather than a reflexive and symbolic description. The questions are kept to a strict minimum in order to reduce the impact of the suggestion: "What happens next? How do you know that…? How do you feel…?"

The clinician then carefully observes how the patient reacts. The aim is to verify, by means of different clues, that the patient is indeed re-experiencing the situation in a concrete way at sensory and emotional levels. This state of evocation will be noticeable thanks to a slowing down of the voice, a certain fixity of the gaze, eye movements that signal a search for sensory information, a phenomenological richness in the description of the experience, and the use of the present tense. The goal is thus to obtain an experience that is sufficiently close to the initial anomalous experience thanks to a precise phenomenological description, even if the intensity of the description is less than the intensity of the initial experience itself.[24]

The detailed description of the experience in this state of evocation favors its integration through an effect of reliving the representations and emotions. Indeed, the slowing down of the subjective experience helps the patient to become more "aware" of psychological elements that have gone through her or his experience in a way that was too brief to be integrated at a reflexive level. For example, certain emotions that have been cleaved from subjectivity and that were not "felt" (Winnicott, 1989). From this point of view, micro-analysis operates like the digestive system by breaking down nutrients (in this case psychological elements) in order to absorb them as already proposed by Bion (1965). The same process probably occurs with other psychotherapeutic techniques – especially hypnosis, EMDR (Calancie et al., 2018), or psychodrama (Wieser, 2007) – and relies on the principle that the recall of traumatic experiences may induces therapeutic effects (Ford, 2018; Engelhard et al., 2019).

Compared to these other approaches, cognitive analysis permits a very precise description of the patient's representations (Finkel, 2017). Mental activity is more precisely separated into three main types of mental objects: sensations (visual, auditive, or kinesthetic), emotions (primary and secondary), and symbolic (verbal language; Rabeyron and Finkel, 2020a). These mental objects "appear" within the attentional buffer which is itself connected to a long-term information storage system. The subjective experience also relies on the attentional processes that can be present in the internal or the external world. The stream of consciousness can then be conceptualized as a cognitive algorithmic sequence – i.e., a finite sequence of internal and external states and actions – which is a synthetic representation of the successive mental states of the patient (Rabeyron and Finkel, 2020a,b).

Subjective Integration of the Anomalous Experience: Feeling of the Experience

This phenomenological approach then opens the way to a more in-depth work of elaboration of the feelings associated with the anomalous experiences. We can identify in particular three axes of work with the patient during this step (emotional containment, de-pathologization, and detachment; see right part of **Figure 1**), even if it is difficult to distinguish these axes given that they often occur in parallel and that their evolution may be very different from one person to another.

Emotional Containment

The first axis involves the containment of the anxieties associated with the anomalous experiences while the patient frequently

[23]Micro-phenomenology is a recent phenomenological approach that permit to explore very finely subjective experience thanks to specific interviews technics. It gives a very precise and details description of the inner experience.

[24]It may also happen that the clinician needs to "reduce" the intensity of the state of evocation (by the questions asked to the patient) in order to avoid the person being emotionally overwhelmed.

asks: "what has just happened to me"? In this regard, the IGPP reports that nearly 80% of the people who contact them report anxiety as a consequence of the experiences they have encountered. The "ontological shock" – initially described by the psychiatrist John Mack (1994) for alien abduction experiences – is also found after many anomalous experiences. This shock is usually the consequence of an anomalous experience which does not "fit" with the previous conception of the reality of a person (a sort of "personal paradigm of reality"). Something "impossible" has happened, which is particularly disturbing for the psychological functioning (whose main aim is to predict reality and its proprieties), leading to an overflow of the person's descriptive capacities (Belz-Merk, 2000). These people are frequently in a crisis situation and they need some kind of reassurance as illustrated by the case Laetitia.

Aged about 30, Laetitia contacted the counseling service because she was very disturbed by phenomena occurring at the hospital where she was working as a nurse to the point that she was afraid to go there. For about 3 weeks, phenomena had been disturbing the night shifts. A door "opened by itself," lamps lit up for no reason, and several people heard "voices, breathing and shouting." Laetitia even had the impression, during a ward-round with one of her colleagues, that she was being chased. The most disturbing thing happened when a door she had just locked then opened while no one was in the room. Laetitia had been taking these issues very seriously, especially because this was not the first time she had been confronted to this kind of phenomenon. When she was a child, she said "objects moved" in her room and "drawers opened by themselves." In this type of situation, the session is focused on the emotional tension associated with these experiences in order to help Laetitia to understand the nature of the experiences she reported and how she could apprehend them in a more appropriate manner. Overtly, we listen to the patient in an open and non-judgmental attitude in order to increase their ability to speak freely of an experience that was not described before due to the fear of being considered crazy. Implicitly, we tell the patient "Here, you can say everything you want, even experiences that seem impossible." This attitude also suggests that we "take seriously" what the person is saying in order to help the expression of all the emotions linked to the experience, in particular feelings of fear, culpability, and shame, that were not expressed before.

Depathologizing

A second axis concerns the "de-pathologizing" of the experience. Many people experience intense fear that they are going crazy after an anomalous experience and ask: "does this experience mean I am crazy?." This anxiety is increased by the fact that the paranormal is often stigmatized in our society as a sign of madness and this is why many people avoid talking about these experiences with a psychiatrist or a psychologist.[25] This fear is not totally without foundation and it happens that some of these experiences are confused with or reduced to a medical condition.[26] This pathologization of anomalous experiences can sometimes even induce a "secondary trauma" when the person attempts to share such an experience and has the feeling that it is reduced to a mental disorder (Evrard, 2007; Roxburgh and Evenden, 2016a).

Because of this, the clinician should reassure the person regarding the nature of his or her experience and support the understanding of the potential relationships between anomalous experiences and psychopathology. In this regard, we usually explain that such experiences do not mean they are becoming crazy and that many people have experienced similar things. This can seem obvious, but in certain situations, it might bring a real relief because the stigmatization of these experiences can be particularly pronounced. For example, Juliette reported frequent vision of "balls of light" both in her normal state of consciousness or on the verge of sleep. She did not know what to do with these visions which disturbed her deeply to the point that she had lost her job. She described a spiral of anguish and misunderstanding toward these experiences. An exchange with her, in a non-judgmental way, working notably on the possibility that these experiences might be the consequence of a high transliminality helped her to put words on these experiences which diminished her anxiety. She progressively found a way to cope with these experiences and regained an equilibrium state allowing her to follow her usual activities even if these visions continued.

Nevertheless, clinical work does not consist only of reassuring the person and "depathologize" the experience. As already mentioned (see **Figure 2**), there are many relationships between psychopathology and anomalous experiences. Consequently, the clinician has to support the patient in the recognition of the potential relationships between these factors. More precisely, two classical mistakes have to be avoided: reinforce the defensive aspect of the experience by refusing to consider what it conveys of the psychological suffering of the person (for example, consider psychotic symptoms only as the emergence of some mediumistic abilities); conversely, reduce the experience to a mental disorder (for example, the prescription of antipsychotics after an out of body experience). We try, instead, to support the person toward a better understanding of how anomalous experiences and potential psychopathology could be related as illustrated by the case of Charles.

Charles was employed as an engineer after scientific studies and had no interest in the paranormal. He then experienced "flashes" about personal events of people he could meet and started wondering if he was a psychic. He also began to practice healing and developed an interest in mediumship. Then, in a context of professional harassment, Charles experienced a period of "acute distress" which finally led to his admission to a psychiatric hospital after he thought that he was possessed and that the end of the world was coming soon. When he contacted CIRCEE, he was not sure about what he was

[25]The IGPP reports that almost half of the people who contact them already see a psychologist or a psychiatrist, which also corresponds to the data we have collected in the counseling service. They have usually chosen to not speak about these experiences with their current therapist.

[26]In the same manner than hypnosis has been considered for a long time only as a pathological state (Roustang, 2003).

confronted with: was it some kind of "awakening" or was he suffering from a mental disorder? Should he become a healer, a medium or should be treated as a psychiatric patient? He was torn between the conviction of having a gift – seeing events by clairvoyance, being able to heal people through magnetism – and the feeling of losing grip with reality because of some kind of amplified "sensitivity." He also had the feeling that his thoughts were "going off the rails" and usually experienced, at these moments, a strong psychological distress associated with an intense fear of a breakdown.

Charles seemed to combine symptoms of mental disorders and anomalous experiences even if there is not clear limitation between these two domains. In this type of situation, it seems to be appropriate to help the patient to understand the relationship between these two dimensions and other psychological factors. Anomalous experiences are indeed linked to specific personality traits, like transliminality (Thalbourne, 2000), thin mental boundaries (Houran et al., 2003), absorption (Irwin, 1985), dissociation (Ross and Joshi, 1992), fantasy-prone personality (Wilson and Barber, 1983), and hypnotizability. These personality traits, which are usually highly correlated, are not pathological in themselves (Cardeña et al., 2014) but might favor the emergence of anomalous experiences and some kind of specific relation to the external and the internal worlds. We would finally have 10 sessions with Charles in order to help him to understand what could be considered as a psychotic breakdown and what could belong to the domain of anomalous experiences. He finally managed to regain a certain psychological balance and his interest in the paranormal has gradually decreased, leaving more space for existential questioning concerning the meaning of life and his professional future.

Detachment

Many patients are convinced that their experience is unique and particularly significant, saying something like: "what happened to me is incredible. I am unique and different!." This uniqueness may reflect the narcissistic dimension associated with anomalous experiences, which is also frequently present in the terms used to describe them, for example, the feeling to have been "chosen" or to be an "exception" during a mystical or an abduction experience (Rabeyron, 2018). This desire to be "different" or to be "an exception" can be understood as the expression of deprivation or suffering during childhood. Certain of these people might have felt a prejudice and the anomalous experience appears, from an unconscious point of view, as a form of compensation as proposed by René Roussillon (2015) who has underlined that the "stance of exception (…) characterizes a certain form of torsion of narcissistic regulation and the relationship to the human condition" (p. 44). This psychological functioning emerging as anomalous experiences would thus express the return, through the paranormal, of narcissistic suffering. These experiences then translate a narcissistic fragility into a feeling of omnipotence which appears all the more grandiose as it supports a fragile narcissism. It is therefore difficult for the person to take a certain distance from the experience, because one of its functions is precisely to get the feeling to be different. To know without knowing, to know at a distance, to free oneself from the usual boundaries of space and time would then be the barely disguised expression of omnipotence of thoughts and magical thinking in order to control the world and avoid potential traumatic experience.

The outstanding aspects of these experiences might also induce strong negative feelings when the experience becomes terrifying (especially with abduction and poltergeist cases) and the person is not able to be objective about the experience as illustrated by the situation of Pauline. During the sessions, she described psi perceptions that "came back in droves" when she became pregnant at the same time as grieving for her grandmother. She was then embarrassed on a daily basis by "telepathic experiences" and tried to "shut it down" because she was feeling "hypersensitivity" at the surface of her skin. At this time, she also had two precognitive dreams. The first was about the Beslan bombing, involving the killing of children. She also had a dream about a terrorist attack in Spain. She then wondered if she was going crazy but she was reassured to see that this event finally happened in reality. Nevertheless, when Pauline had these dreams, she was so anxious that she did not want to leave her house. The clinical work seeks to help the patient to distance themselves from the experience, but most of the time this task is all the more complicated when the experiences are intertwined with unconscious aspects. Thus, the fact that Pauline considered these dreams as precognitive experiences, and not the potential expression of her own unconscious, prevented her from trying to understand the meaning of these experiences (In this case, dreaming of children who are killed when she is about to become a mother could be very disturbing). In this regard, these precognitive dreams might be considered as a defense mechanism (projection) that involve projecting anxieties that cannot be symbolized in the outside world.

These anxieties do not appear in delirious and hallucinatory forms but rather are expressed during dreams and hypnagogic states. Here, we observe a defense mechanism that can be found in many anomalous experiences and which is based on a projection principle: "I am not the cause of the phenomena encountered, they are the consequence of paranormal forces" or "this dream does not concern me, it is a precognitive dream." The most intimate elements of the psychological life are thus "externalized" before being the object of denial. In Pauline's case, a sympathetic and open listening finally helped her be more objective about her precognitive dreams and finally managed to question their meaning.

Subjective Integration of the Anomalous Experience: Meaning of the Experience

The third step after the phenomenological exploration and the subjective inscription is the elaboration of the underlying meanings of the experience in spite of an initial attitude of many patients which might be summed up as: "this experience makes no sense." The anomalous experience is indeed frequently described as meaningless and appears as a "foreign body" within the psyche. We usually try to question the reasons why a person reports an anomalous experience at a given moment in life. The phenomenological analysis, emotional

containment, de-pathologizing, and distancing then operate as preliminary steps before the integration of the meaning of the anomalous experiences. We thus start with an "exceptional demand" which often become "more ordinary," and therefore more "thinkable" by the patient, in order to put the anomalous experiences into perspective from a more global psychological point of view. The experience thus appears as a starting point, a doorway, from which therapeutic work can be initiated.

It then appears that the paranormal experience frequently corresponds to diverse psychodynamic functions. The clinician can help the person understand these underlying psychodynamic aspects of the experience. Each person has a different and specific relationship toward the anomalous experiences, but we can nevertheless observe some redundancies in the psychological difficulties encountered by the patients. The analysis of interviews conducted at the IGPP, using a Plan Analysis (Caspar, 2007), has shown that anomalous experiences usually correspond to five prototypes of psychological needs associated with unconscious dynamics: (1) externalizing personal difficulties (2) making life more predictable and controllable (3) regulating self-esteem (4) seeking meaning and (5) reducing emotional outbursts by avoiding painful events (Belz and Fach, 2015).

More precisely, after many sessions with people reporting anomalous experiences, we have developed a specific model of the emergence of these experiences (Rabeyron et al., 2010; Rabeyron and Loose, 2015) taking into account childhood aspects, structure of personality, negative life events, and transformational processes as illustrated by **Figure 3**. Many sessions with patients reporting anomalous experiences have led us to observe that they usually appear during, or after, a strong emotional and negative even, for example an accident, a romantic break-up or the death of a loved one (fourth step in **Figure 3**).[27] We have proposed to call this specific reaction a "paranormal" or "anomalous" solution (Rabeyron et al., 2010) which is usually closely related to paranormal beliefs (fifth step). There is also frequently an inaugural paranormal experience, i.e., a first anomalous experience that leads to many others and that echoes an earlier trauma during childhood as already underlined by Irwin (1996). This first step, during childhood, may correspond to a specific traumatic event, recurrent early pathological intersubjective relationship or a family environment in which the paranormal was prevailing. These different factors seem to favor an "anomaly prone personality" (Simmonds-Moore, 2012) characterized by personality traits already mentioned (second step on **Figure 3**: fantasy-prone personality, transliminality, interpersonal control, dissociation, absorption, and hynotizability). The fifth and last step correspond to the transformational aspects of the anomalous experience that we sometimes observer after the experience and which is often associated with an increase in wellbeing and creativity (Rabeyron, 2020).

[27]This link between negative life events, trauma, and anomalous experiences has been confirmed using a quantitative approach showing that people report more negative life events in the year preceding the emergence of anomalous experiences (Rabeyron and Watt, 2010).

In this model, the first and inaugural anomalous experience can be considered to be a specific coping strategy, which takes the form of an original reaction to negative life events. However, this strategy is rarely obvious to the patients, and most of the time they do not speak spontaneously about the negative life events or they do not see a connection between the anomalous event and their personal life. This model can guide the psychological counseling and help the person understand the meaning of the experience and its relationship with a broader perspective on personal life.

From this point of view, the sharing of such an experience with another person, especially a clinical psychologist, is in itself a first of step for the integration of the underlying psychological aspects of the experience and its meaning from a personal point of view. Indeed, the anomalous experience appears as an experience that needs to be shared in order to be metabolized, its sharing with another person being part of its future elaboration (Rabeyron, 2020). Such a process can be particularly beneficial when the person has the ability to elaborate psychological processes that have been "projected" into the environment as illustrated by the case of Patricia. She described how she felt unsettled by vivid premonitions she was experiencing on a regular basis when she contacted CIRCEE. These premonitions occurred especially when she was about to fall asleep, mainly in the form of symbolic expression (for example, "a torn turtleneck" or a "chest of drawers without a handle") about her personal life and close relatives. She then needed to "translate" these dreams in order to understand their meaning. For example, "meat dreams" were, in her opinion, frequently the sign of negative future events and such dreams happened before she encountered difficulties at her job. These precognitive impressions have always been present in her life, but they were particularly pronounced a few years ago after several breakups. Patricia finally managed to elaborate these experiences and has been able to consider potential links between her personal life and the emergence of these dreams, which progressively helped her to reduce her anxiety.

The phenomenon reported by Patrick seems to be based on the same principles. He was experiencing recurrent and disturbing precognitive dreams. For example, he dreamed of a mechanical breakdown and discovered the next day that his water heater was broken. Another dream concerned two policemen he finally met afterward a few days later. He was wondering about the cause of these dreams, whether he was really perceiving the future and to what extent he himself was the cause of events that occurred later. He proposed this interesting metaphor during a session: time is similar to the backdrop of a canvas on which the "threads of the future" are grafted, giving him the impression that the future is somehow already existing. He was wondering if it was possible to change the future and was very afraid of influencing it which led him to existential questioning: "what is the point of continuing to live if the future is already written?." Here, the metaphor of the canvas could be interpreted as a metaphor of the unconscious where the threads of the future are grafted into the canvas of the past. The fear of influencing the future might also be an expression of magical thinking and give a feeling of control in order to avoid unpleasant events.

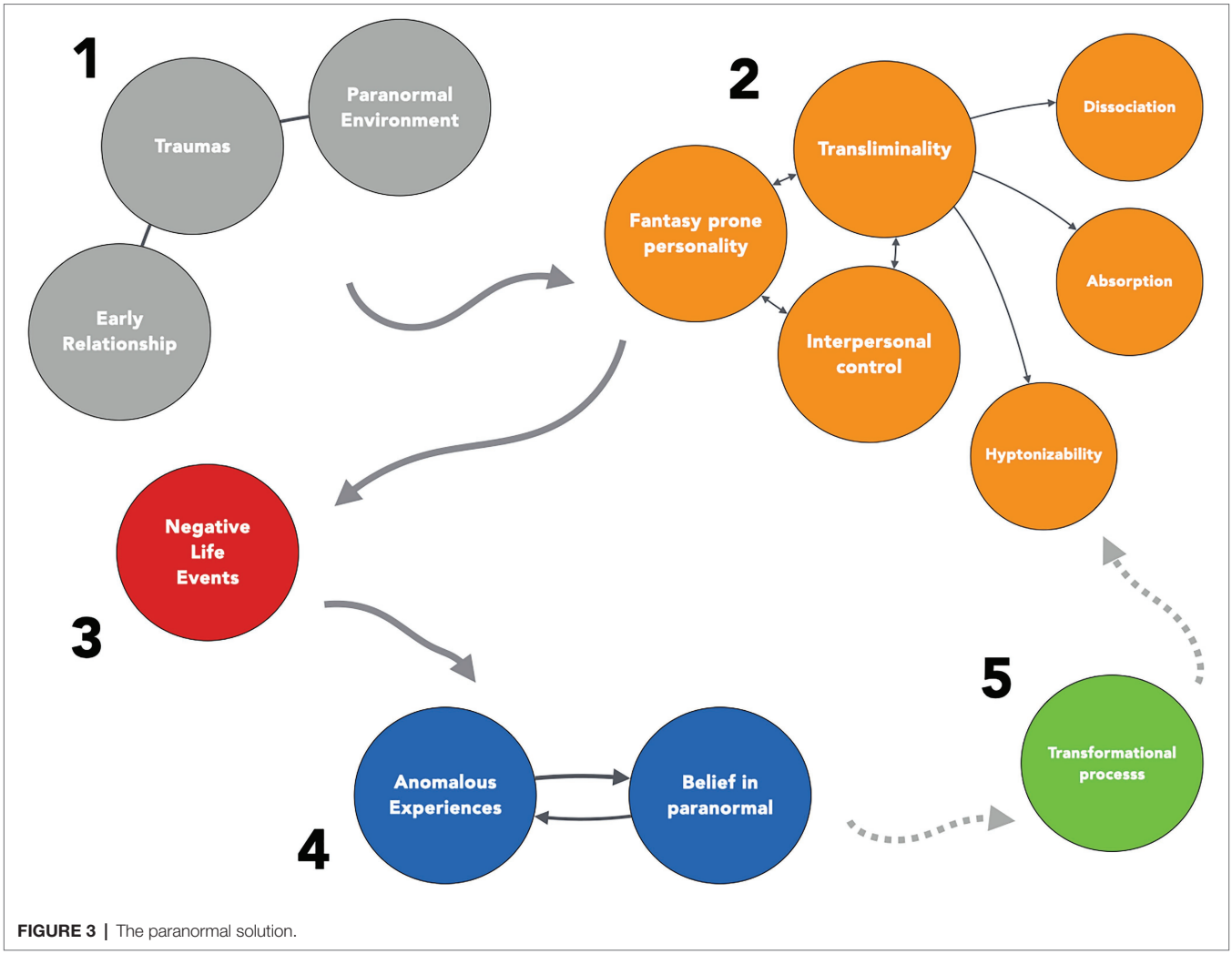

FIGURE 3 | The paranormal solution.

This association between magical thinking, projection of anxieties, and precognitive experiences is also illustrated by Pascal who contacted the counseling service concerning precognitive and *déja vu* experiences. It began when he was a child after his father has been electrified by a stingray while fishing. Pascal was traumatized by this event and has since been very afraid that his parents could die. In the aftermath of this episode, he experienced *déja vu* on a very frequent basis, up to five times per day. He described these as "movies" that he perceived as memories but which then really happened in real life. Pascal also reported frequent presentiment experiences. For example, he sensed that "something bad was going to happen" before he learned that a friend had an accident. But he also realized during the sessions that things were maybe more complicated than they seemed. For example, he had seen in dreams the death of a famous singer or experiencing finding treasure, neither of which occurred. Pascal finally came to the conclusion that these experiences were a mixture of forebodings, desires, and fears.

As illustrated by these different cases, the clinical work consists of helping the patient to integrate the potential meaning of these experiences and also, more generally, what might be symbolized in this manner. This implies being able, for the patient and the therapist, to "play" with the experience in order to release its symbolic potential beyond its defensive aspects. The core principles of psychodynamic therapies, already mentioned previously (see: Blagys and Hilsenroth, 2000; Shedler, 2010), are used during this process, especially the analysis of transference, free association, symbolization, reflexivity, and narrativity as illustrated on the right part of **Figure 1**.[28] More specifically, we pay close attention to the transference on the clinician (how does the patient "replay" elements of his or her own history in the therapeutic relationship?), to free association (how the patients pass spontaneously from one idea to another and how associativity helps to understand the relationship between the anomalous experiences and the unconscious?), to symbolization processes (how the patients transform their experience, especially by the use of play, dream, and creativity?), to reflexivity (how the patients increase their ability to auto-represent their psychological functioning and thus manage to increase objectivity toward the anomalous experiences?),

[28]For more details on these concepts, see in particular: Roussillon, 2014.

and to narrativity (how the patients can tell a coherent story of personal experience in which the anomalous experiences are integrated?). Psychotherapeutic work oriented along these different axes will favor the progressive integration of the anomalous experience. This initial topic may even become secondary and more "classical" processes might emerge during the therapy. Finally, when the underlying psychological issues require more intense or longer care, we encourage the patient to continue the therapeutic journey in a more appropriate setting for a longer psychotherapy.

CONCLUSION

A significant proportion of the population report anomalous experiences and about one person in two will present difficulties in integrating them. In this regard, these "subjective anomalies" can be associated with different forms of psychological suffering and have complex relationship with psychopathology. This implies that clinicians should be trained to recognized and understand these experiences.

After having described in broad outline the type of clinical setting already developed in this domain, we have presented the clinical practice developed specifically for anomalous experiences at the CIRCEE. We have more precisely presented the leading principles of a Psychodynamic Psychotherapy focused on Anomalous Experiences (PPAE) based on three main components: phenomenological exploration (description of the experience), subjective inscription (feeling of the experience), and subjective integration (meaning of the experience). Such an approach implies general and specific knowledge (about psychopathology, anomalous experiences, and anomalistic psychology) and a specific clinical attitude (recognizing extreme forms of transference of rejection, fascination, and the uncanny; taking into account objective and subjective levels of reality; and develop an approach based on non-judgment and undecidability). These different elements lead to an open and neutral listening which favors the transformation of the ontological shock that follows some of these experiences into a potential for integration and psychological transformation.

Only a few clinicians work in counseling services specialized in this area. But the model we have proposed could also be useful for those who work in more classical clinical settings when they encounter such experiences. From this point of view, it appears that most clinicians are still not taught, or trained, to recognize these experiences (Corbeau, 2004). It follows that sometimes an attitude of rejection can develop associated with a form of stigmatization of these experiences and their reduction to mental disorders. It seems more appropriate to welcome these unusual experiences in a way that conveys to the patient that they are understood, even when these experiences challenge the therapist's conception of reality. This attitude is all the more important in that these experiences often expressed indirectly the most intimate aspect of personality and in particular traumatic experiences. Such a clinical attitude helps the person to "go through" the ontological shock associated with some of these experiences, developing the capacity to regain a state of psychological balance and the ability to give a meaning to the experience. This process can also be an opportunity for maturation and transformational processes sharing certain characteristics with post-traumatic growth (Schubert et al., 2016). More specific studies on these transformational processes appear as a promising area of research, especially in their relationship with spiritual aspects considering their potential positive impacts on mental health and wellbeing (Brown et al., 2013; Oman, 2018; Kao et al., 2020).

Further developments in this domain could also aim at evaluating the efficacy of counseling focused on anomalous experiences. Such an approach has been initiated at the IGPP where the counseling service has been evaluated positively by the patients and led to a decrease in distress and the development of coping strategies (Landolt et al., 2014). We have also observed qualitatively that many patients seem to be relieved after the counseling sessions. The opportunity to discuss with specially trained clinicians seems to contain the downward spiral, at the somatic and psychological levels, in which some of these patients are stuck. These evaluations could rely on mental health scales, notably in the long term, in order to evaluate the evolution of the patients after the therapy. It could also help in the understanding of their evolution depending on personality traits and the type of anomalous experiences. These data could improve the coherence and the relevance of the counseling approach proposed to these patients due to a better understanding of these different aspects. This specific knowledge could also be applied more frequently in the training of clinicians in order to help them to work more effectively with their patients when such experiences emerge during the therapeutic process.

DATA AVAILABILITY STATEMENT

The original contributions presented in the study are included in the article/supplementary material, and further inquiries can be directed to the corresponding author.

ETHICS STATEMENT

Written informed consent was obtained from the individual(s) for the publication of any potentially identifiable images or data included in this article.

AUTHOR CONTRIBUTIONS

The author confirms being the sole contributor of this work and has approved it for publication.

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The Relationship Among Spirituality, Fear, and Mental Health on COVID-19 Among Adults: An Exploratory Research

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The novel coronavirus disease (COVID-19) is impactful on all aspects of individuals' lives, particularly mental health due to the fear and spirituality associated with the pandemic. Thus, purpose of this study was to identify the relationship among fear, spirituality, and mental health on COVID-19 among adults in Malaysia. This study also examines spirituality as a mediator in relationship between fear and mental health. The study involved around 280 adults in Malaysia. This research is a quantitative study. Data analysis method (SEM-PLS) has been used for data analysis. Based on descriptive analysis, mental health questionnaire indicated that 60.0% of them are at a poor level of mental health whereas 57.5% of respondents showed a moderate level of COVID-19 fear, and 60.4% of respondents owned moderate level of spiritual well-being. The results also demonstrated that respondents that have a high level of fear would have a high level of mental health; interestingly, those with a high level of spirituality will have a lower level of mental health. Findings indicated that spirituality significantly mediated the relationship between fear and mental health. This research will help to demonstrate how important spirituality values to control mental health to be more positive among adults in Malaysia. The main contributions of this study are to help come out with new intervention method for those who are mentally ill and need help.

Keywords: spirituality, fear, mental health, COVID-19, adults

INTRODUCTION

In early 2020, coronavirus disease (COVID-19), originating from Wuhan in Hubei province, began to spread throughout China (Li et al., 2020). World Health Organization (WHO) stated that there is a high risk of COVID-19 spreading to other countries worldwide. In March 2020, WHO assessed that COVID-19 could be characterized as a pandemic (WHO, 2020). As a result, the majority of countries in the world have to take drastic measures to adopt a nationwide lockdown and practice social distancing to fight against and to flatten the curve of the COVID-19 infection. The spread of the disease without any vaccine and uncertainty and low expectations of COVID-19 not only threaten people's physical health but also poses challenges to people's mental health for the entire human race. For instance, in Italy, local people have high levels of stress due to no firm estimate

of how long the pandemic will last and how long our lives will be disrupted or whether or not our loved ones or we will be infected (Montemurro, 2020).

In China, fear of abandonment, neglected death toll increase among patients, and feelings of loneliness and anger have developed among people who are quarantined (Xiang et al., 2020). Research by Zhang et al., 2020 shows that being quarantined decreases face-to-face connection and social interaction, and it contributes to the stressful situation among people. Besides, in India, most of the people are in fear, disgust, stress, and extreme sadness about the lockdown on March 25, 2020 (Barkur and Vibha, 2020), sleep difficulties, and paranoia about acquiring COVID-19 infection (Roy et al., 2020). One of the reasons is social isolation which can cause people to get stress (Holt-Lunstad et al., 2015).

Even though many coping techniques and procedures have been formulated for COVID-19, past studies have proved that spirituality values improve people's well-being. Richards and Bergin (2005) and Young et al. (2007) have demonstrated the connection between spirituality with mental health and well-being. Spirituality has helped people with making decisions and helping people to cope with stress when they have difficulty in life (Pargament et al., 1988; Thurston, 1999). When people are practicing spirituality values, they can overcome depression (Westgate, 1996; Srinivasan et al., 2003) and anxiety (Graham et al., 2001). Brown et al. (2013) in his research have proven that spirituality well-being has a significant effect on anxiety and depression and those who have a higher level of spirituality have a reduction in their mental illness. Furthermore, some research studies have been performed to investigate how spirituality could help people to improve their self-esteem, giving them moral support and searching meanings of life among patients with cancer (Thune-Boyle et al., 2006).

Another critical element that needs to be looked into is the fear of illness. Fear is related to the contemporary mental health system (Laurance, 2003). Fear is defined as the unpleasant emotional state that is elicited by a perceived threat (de Hoog et al., 2008). Due to the lack of control on the pandemic in terms of unavailability of an effective vaccine and treatment cure, individuals naturally began experiencing fear regarding developing the disease. Literature suggests that whereas fear of COVID-19 propels individuals to observe the rules that will help to minimizing the spread of the virus, it may also result in an array of psychological effect such as anxiety (Roy et al., 2020) and depression (Holmes et al., 2020). Fear is also linked with mental illness with different types of sociocultural factors such as our belief and dominant culture (Halliwell, 2009). Previous studies have highlighted that there is a significant relationship between the fear of illness and mental health (Laurance, 2003). Even though fear and mentality are positively related, but there is very few research that explores the relationship among fear of COVID-19, the value of spirituality, and mental health among adults in Malaysia. These three aspects are closely related, but how can they be seen during the COVID-19 pandemic. Even though spirituality and fear have been discussed in the past, there is still the question of how spirituality could help people who have mental illness and fear of disease. Research is still lacking regarding the pandemic, notably the COVID-19 pandemic.

The main aim of this study was to examine the relationship between fear of COVID-19 and mental health with an adult sample as mediated by spirituality. The hypotheses of the study included that (a) there is significant relationship between fear and spirituality, (b) there is significant relationship between spirituality and mental health, (c) there is significant relationship between fear and mental health, and (d) spirituality mediates the relationship between fear and mental health. As no studies per see examined such link between the concepts, exploring such relationship is certainly worth studying.

LITERATURE REVIEW

Relationship Among Fear, Spirituality, and Mental Health

According to behavioral explanations, spirituality and health are much related because of people behaviors, motivation, belief, attitudes, and thoughts. Physical and mental health are related to psychosocial variables, such as stress, lifestyle behaviors, and health-related cognitions. This helps us to understand how the practice of faith and spiritual path may import impact on psychological health. Individual prayers or worship may produce solution for emotions such gratitude, humility, forgiveness, and some of them be fear of doing bad things. As conclusion, the connections among mental health, spirituality, and fear are described (Levin, 2009).

Relationship Between Fear and Spirituality

Previous research has proved that those who have a fear of diseases but have spirituality values have positive mental health (Hayman et al., 2007; Koenig, 2010). Study by Fardin (2020) indicated that spiritualty aids people to have mental relaxation in times of crisis. Some of the religious solutions proposed against the COVID-19 prevalence could be helpful. This shows that spirituality values can help people who have a fear of coping with difficult situations. Thus, this research proposes the hypothesis below:

> H1: There is significant relationship between fear and Spirituality.

Relationship Between Spirituality and Mental Health

Spirituality is unique in its definition because there is no precise definition of spirituality. Spirituality is looking for meaning in life, peace, bliss, understanding, faith, and love. Rosmiran (2020) mentioned that she has been talking and advising her patients to always have faith and hope to overcome their mental issue, especially during the COVID-19 pandemic. Even patients have been anxious about their life in this pandemic but hope and faith could help them to overcome their mental health state more positively. This proves how much spirituality values could boost up more positive mental health. Many past researches have discussed the relationship between spirituality and mental health (Seybold and Hill, 2001; Miller and Thoresen, 2003; Powell et al., 2003). Thus, this research proposes the hypothesis below:

H2: There is significant relationship between spirituality and mental health.

Relationship Between Fear and Mental Health

The fear of COVID-19 is undoubtedly affecting mental health condition of people. Research by Zhang et al., 2020 shows that during quarantine, people lose face-to-face connection and social interaction, and it contributes to a stressful situation among people. Fear can cause many mental health issues because people get worries related to disease and also because they have been isolated at home for a more extended period. People who already have some mental health issues will be more exceptional in having mental health risks such as fear and anxiety. This statement has been proven by Druss (2020). Fear is not only related to disease but also toward social distancing, and this has been proven by Holt-Lunstad et al. (2015), whereby social distancing can cause many health problems such as fear, guilt, unhappiness, and depression. His finding shows how much fear can contribute to mental health, and it becomes worse for those who already have some mental health issues. In China, fear of abandonment, being neglected and rising death among patients, and feelings of loneliness and anger have developed among people who are quarantined (Xiang et al., 2020). When social distancing was practiced in Malaysia, many adults feel that they are alone and are influenced by the many social media information. Thus, this research proposes the hypothesis below:

H3: There is significant relationship between fear and mental health.

Spirituality as a Mediator

Based on previous study, spirituality is the important variable as a mediator (Reutter and Bigatti, 2014; Trigwell et al., 2014). Spirituality values can help people to cope with fear and mental health issue. When spirituality values are high, people give less importance to emotion and become more focused on daily work. Even if people are experiencing social distancing and also having less social connectedness with their friends, family members, and colleagues, with spiritually, they can have faith and hope. This spirituality reduces their fear of disease. Spirituality makes them stronger in their relationship with fear and mental health (Bonelli et al., 2012). Furthermore, in Malaysia, adults are multiethnic whereby each of them has different faith and belief systems in society (Rathakrishnan et al., 2021). In light of these results, it is possible to conclude that spirituality assists individuals to cope better with life disruptions and allows them to view life more positively. Thus, this research proposes the hypothesis below:

H4: Spirituality mediates the relationship between fear and mental health.

THE RESEARCH FRAMEWORK

Figure 1 indicates the research constructs and the operationalization of the constructs based on the past studies.

Figure 1 shows the research framework of the study on how the fear impacts on spirituality with mental health, and spirituality becomes a mediator in relationship between fear and mental health. This is very crucial which concerns the spirituality of awareness and understanding of what issue the adults experiencing in their mental state and how it is related to fear also become an important element to consider necessary during the COVID-19 pandemic. Stemmed from the above framework, this research, therefore, derived a few hypotheses that are constructed as follows:

H1: There is significant relationship between fear and spirituality.
H2: There is significant relationship between spirituality and mental health.
H3: There is significant relationship between fear and mental health.
H4: Spirituality mediates the relationship between fear and mental health.

RESEARCH METHODOLOGY

Research Design

This study has used convenient sampling design, and the total of 280 questionnaires was received from the respondents. Random sampling is the purest form of probability sampling. Each member of the population has an equal chance of being selected. This simple random sampling design has the least bias and offers the most generalizability (Sekaran and Bougie, 2013).

Sample

In this study, the population is the adults in Malaysia. Adults are classified as individuals who are above the age of 18 years. In 2019, there were approximately 21.82 million adults in Malaysia. According to Raosoft calculator the with the 90% and 0.05 is 271 sample size.

Instruments and Measures

Spiritual well-being questionnaire (SWBQ) was a set of self-rating questionnaires designed to measure personal's well-being, communal well-being, environmental well-being, and transcendental well-being (Gomez and Fisher, 2003). It consisted of a total of 20 items, containing five items for each domain

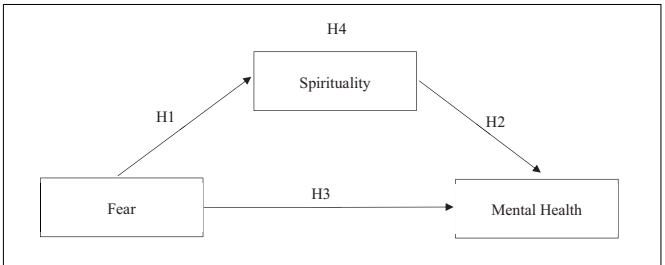

FIGURE 1 | Research framework. Obtained from Universiti Malaysia Sabah.

mentioned previously. It used a four-point Likert scale (1 = very low, 2 = low, 3 = high, and 4 = very high).

Fear of COVID-19 Scale (FCV-19S) was seven items scale for measuring fear of COVID-19 (Ahorsu et al., 2020). The response type was modified from a five-point Likert scale to a four-point Likert scale (1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree).

Patient Health Questionnaire for Depression and Anxiety (PHQ-4) was used to measure respondents' mental health in terms of depression and anxiety (Kroenke et al., 2009). It consists of four items where two items are taken from Generalized Anxiety Disorder-7 (GAD-7) and another two from the Patient Health Questionnaire-8 (PHQ-8). It uses a five-point Likert scale (0 = not often at all, 1 = not so often, 2 = somewhat often, 3 = very often, and 4 = extremely often). The greater the score in PHQ-4, the greater the level of depression and anxiety, and hence the lower the level of mental health. For this research, all measures for SWBQ, FCV-19, and PHQ-4 have been used 3 scales (low, moderate, and high) as suggested by Mohd Majid (2002).

Procedure

In this study, the respondents were recruited using a convenience sampling technique. The entire study was obtained ethical approval board reference to JKEtika 3/20 (11) from the Ethical Board of University Malaysia Sabah. Prior to data collection, signed consent was obtained from each respondent, and they were assured with anonymity and confidentially of data. A total of 280 respondents were selected for the purpose of this research.

Data Analysis

Data analysis method (SEM-PLS) has been used for data analysis.

RESULTS AND DISCUSSION

Table 1 shows that about one-third (36.1%) of the respondents were men and the other 63.9% were women. In this survey, 198 (70.7%) of the respondents are aged from 18 to 35 years old and 82 (29.3%) aged from 36 to 56 years old with the mean age of 29.5. Most respondents (68.2%) were single, 31.4% married, and 0.4% divorced. Totally, 171 (61.1%) of the respondents were undergraduate, 66 (23.6%) were graduate, and 43 (15.4%) were postgraduate. In addition, 204 (72.9%) respondents stayed in urban areas, whereas 76 (27.1%) in rural areas.

Based on descriptive analysis as shown in **Table 2**, most respondents (41.4%) self-reported a good level of mental health, whereas the mental health questionnaire indicated that 60.0% of them are at a good level of mental health. Overall, 96.4% of respondents showed a moderate level of COVID-19 fear, and 60.4% of respondents owned a moderate level of spiritual well-being. About half of the respondents (50.7%) indicated a moderate level of spiritual transcendence.

TABLE 1 | Distribution of respondents.

	Frequency	Percentage (%)
Gender		
Male	101	36.1
Female	179	63.9
Age group		
18–35 years	198	70.7
36–56 years	82	29.3
Marital status		
Single	191	68.2
Married	88	31.4
Divorced	1	0.4
Education		
Undergraduate	171	61.1
Graduate	66	23.6
Postgraduate	43	15.4
Location		
Urban	204	72.9
Rural	76	27.1

TABLE 2 | Descriptive analysis on mental health, fear of COVID-19, and spirituality well-being (*N* = 280).

Variables	Frequency	Percentage (%)
Self-report mental health status		
Poor	9	3.2
Fair	51	18.2
Good	116	41.4
Very Good	71	25.4
Excellent	33	11.8
PHQ-4		
Good	168	60.0
Moderate	99	35.4
Poor	13	4.6
FCV-19S		
Low	4	1.4
Moderate	270	96.4
High	6	2.1
SWBQ		
Low	11	3.9
Moderate	169	60.4
High	100	35.7

Data Analysis Approaches

In this study herein, the structural equation model used partial least squares regression (PLS regression) path model to verify research hypotheses regarding the effect of spirituality between the fear of COVID-19 and mental health. For analysis tool, the SmartPLS 2.0 program was used. The PLS regression path model stands for a structural equation model. It is based on principal component, that is, total dispersion. This technique can evaluate measurement for validity of variable and structural model (Hair et al., 2016).

Measurement Model Analysis

In this study, to analyze measurement models, the confirmatory factor analysis (CFA) was conducted. The results are derived from

TABLE 3 | Result of crossloading/loadings.

	Fear	Mental health	Environmental	Transcendental	Personal	Communal
F1	0.720					
F3	0.789					
F7	0.758					
MH1		0.807				
MH2		0.806				
MH3		0.821				
MH4		0.777				
S11			0.942			
S13			0.948			
S15			0.919			
S17				0.832		
S18				0.852		
S19				0.828		
S2					0.886	
S5					0.754	
S6						0.880
S10						0.777

analysis on the PLS measurement model. The convergent validity, internal consistency, and discriminant validity were analyzed the measurement model to evaluate and identify the suitability of them (Hair et al., 2016).

Convergent Validity

Convergent validity can be comprehended through individual measuring items for reliability purpose. For individual measuring items with reliability, the loading values should be 0.7 ideally, and 0.6 at minimum in **Table 3** (Hair et al., 2016).

As shown in **Table 1**, all the individual measuring items' value is above 0.720, in which all the items exceed 0.70 or above. Thus, all the measuring items used in this study are valid and indicate that all items secured convergent validity.

Internal Consistency

As internal consistency is a level of validity in which a latent variable set of specific observed variable reflects latent variable, Cronbach's alpha, average variance extracted (AVE), and composite reliability were used to analyze the internal consistency of measuring model. Generally, it has reliability if it is 0.6 or above in Cronbach's alpha and if it is 0.5 or above in AVE value, and it has internal consistency if it is 0.7 or above in composite reliability. As the internal consistency shown in **Table 4**, all the items exceed the above-stated threshold, which secures internal consistency (Hair et al., 2017).

TABLE 4 | Internal consistency.

Constructs	Composite reliability	Cronbach alpha	Average variance extracted (AVE)
Communal	0.815	0.600	0.689
Environmental	0.955	0.930	0.877
Fear	0.800	0.626	0.572
Mental Health	0.879	0.819	0.645
Personal	0.807	0.600	0.677
Transcendental	0.875	0.787	0.701

Discriminant Validity

The level of discriminating a concept of a specific latent variable from a concept of other latent variables is called discriminant validity. In this study, a variable has validity if it uses a square root value of mean dispersion extracted value of all the extracted variables, and an AVE square root value is higher compared with correlation coefficient. The AVE value should 0.70 or above (Hair et al., 2017).

The establishment of discriminant validity of the constructs was presented in **Table 5**. The threshold criteria at below 1 have achieved to all constructs (Henseler et al., 2016). Thus, it shows that each construct achieved the discriminant validity.

Structural Model Analysis

The structural model evaluates variance explanation power (R^2) of structural concept and also evaluates significance of path coefficient (β) expressing causal relationship information between two variables through structural equation analysis.

In **Table 6**, the finding that presented H1 strongly supports (standardized beta = −0.761, $p = 0.00$) that the fear has significant effects on spirituality, and H2 was supported the spirituality significant effect on mental health (standardized beta = −0.212, $p = 0.03$).

Meanwhile, in H3, there was no significant association found between fear and mental health (standardized beta = 0.136, $p = 0.18$). The findings also show that the modeled constructs explain substantial variances in endogenous constructs with good predictive relevance. R2 values were found to be at substantial level for one endogenous construct: SPY ($R^2 = 57.9\%$); and two endogenous constructs: MH ($R^2 = 10.7\%$). **Figure 2** demonstrates the structural and measurement models of this study.

Mediation Effect of Spirituality Between Fear and Mental Health

Table 7 presents the results of hypothesis testing for the indirect path. The findings in **Table 7** concluded a significant indirect effect of spirituality on the relationship between fear and mental health (β = 0.161, *t*-value = 2.156, *p*-value = 0.03). The results confirmed that spirituality is a mediator that completely mediate the effects of fear on mental health, and thus it supports H4.

Coronavirus disease pandemic is impactful on people's life due to several reasons such as lockdowns (Meda et al., 2020) and associated isolation (Hwang et al., 2020), fear of worthlessness, and fear of infection (Dubey et al., 2020). Two of the critical antecedents of such mental health problems might include fear of COVID-19 and spirituality. Thus, this study aimed to investigate whether (a) fear of COVID-19 is related to spirituality, (b) spirituality is related to mental health, (c) fear of COIVD-10 is related to mental health, and (d) whether spirituality mediates the relationship between fear of COVID-19 and mental health. In this regard, this study reports three main results: (a) fear of COVID-19 significantly impacts on spirituality, (b) spirituality significantly impacts on mental health, and c) spirituality mediates the relationship between fear of COVID-19 and mental health.

Relationship Between Fear and Spirituality

Concerning the first hypothesis, this study revealed that fear and spirituality had a significant relationship on mental health. Such results indicate that even if people are afraid of COVID-19, the importance of faith will transcend this anxiety and it brings more positive vibration and compassion within themselves where it makes someone deal with their state of mental health. Such results support the findings of Polizzi et al. (2020), according to which many citizens were happy to uphold spirituality values in times of crisis. They agree that even such actions will offer them more positive values and contribute to better mental health.

Significant Relationship Between Spirituality and Mental Health

In accordance with the second hypothesis, the findings of the SMART PLS analysis conveyed that spirituality significantly effected on the mental health. This finding shows how important spirituality values are when looking into mental health among people, especially during the COVID-19 pandemic. In her writing, Rosmiran (2020) said that she spoke and encouraged her patients to always have faith and hope in overcoming their mental problems, especially during the COVID-19 pandemic. In this pandemic, many patients became worried about their futures, but hope and faith could make them more effectively transcend their state of mental health. This reveals how much faith ideals will improve more positive mental health, and this research shows how belief has more impact when it comes to mental health relative to anxiety.

Relationship Between Fear and Mental Health

Furthermore, the third hypothesis result found that fear of COVID-19 does not significantly effected on the mental health. People get worried quickly and are worried of diseases, especially during the COVID-19 pandemic. People are fearful easily because of the volume of social media information related to cases of people being hurt and dying every day. This condition is referred

TABLE 5 | Discriminant validity.

	Communal	Environmental	Fear	Mental health	Personal	Transcendental
Communal	0.830					
Environmental	0.774	0.936				
Fear	−0.658	−0.575	0.756			
Mental Health	−0.257	−0.200	0.297	0.803		
Personal	0.762	0.797	−0.744	−0.319	0.823	
Transcendental	0.469	0.448	−0.605	−0.327	0.542	0.837

TABLE 6 | Result bootstrapping.

Hypothesis	Path	Beta	S.D	*t*-value	*p*-values	Results	f^2	R^2
H1	FR → SPY	−0.761	0.033	23.070	0.00	Supported	1.373	0.579
H2	SPY → MH	−0.212	0.099	2.139	0.03	Supported	0.021	0.107
H3	FR → MH	0.136	0.103	1.325	0.18	Not Supported	0.002	

TABLE 7 | Mediation effect result.

Path	Hypothesis	Indirect Effects				Results
		Beta	Standard deviation	*t*-value	*p*-value	
FR → SPYmediated by MH	H4	0.161	0.075	2.156	0.03	Supported

****p < 0.001; SPY, spirituality; FR, fear; MH, mental health.*

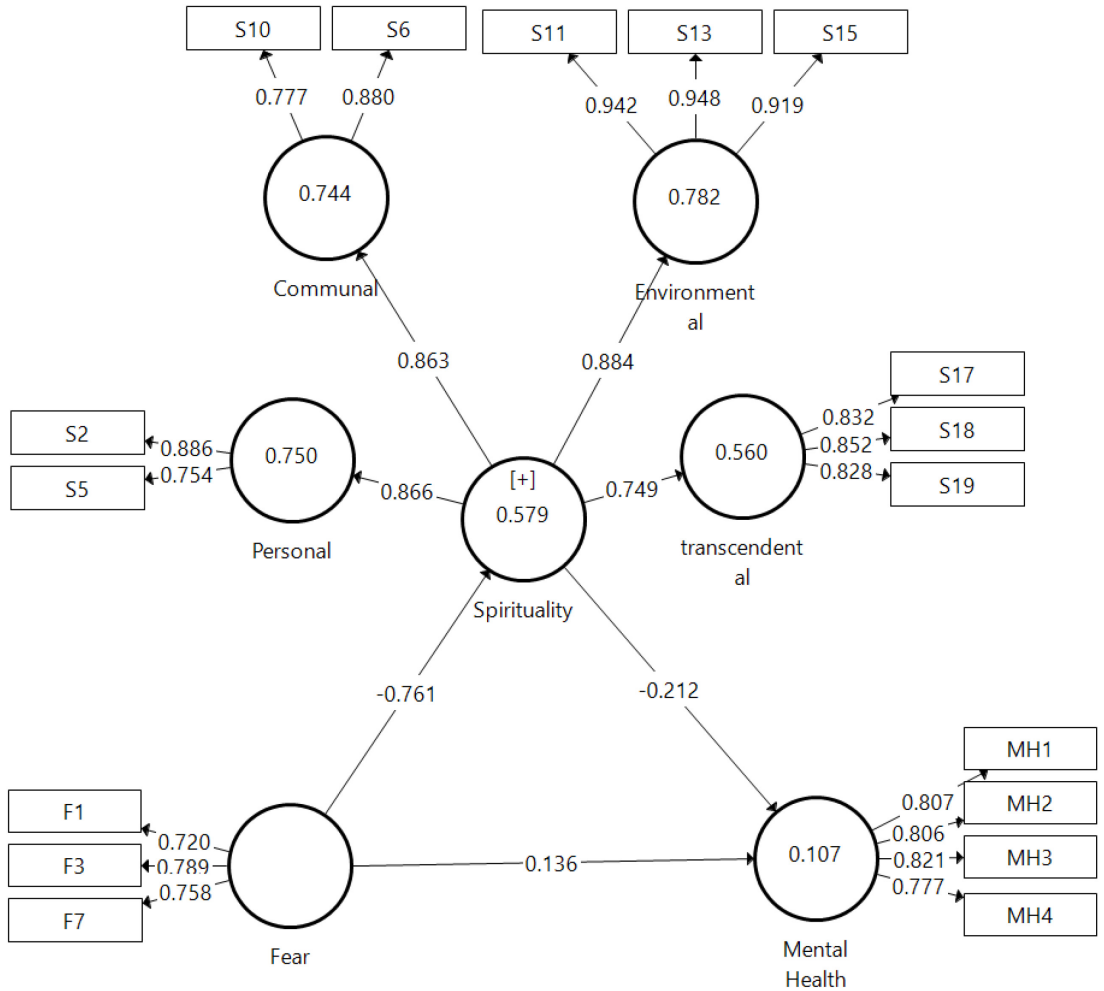

FIGURE 2 | Structural model analysis results. Obtained from Universiti Malaysia Sabah.

to as hypochondriatic anxiety disorder or health anxiety disorder. Fear and anxiety over well-being will trigger certain mental health problems, such as excessive stress and worries, and if ignored too, such doubts and suspicions can create many other mental health issues. But by spirituality, respondent's fear of COVID-19 was overcome and their mental health reduced. It is the evidence based on this study, which clearly does not impact the skepticism of COVID-19 on mental health. COVID-19's mistrust of faith impacts on mental health. It illustrates how spirituality values can help people deal with anxiety and mental health problems. Adults also need a lot of exposes to COVID-19 pandemic and how they can protect themselves (Rathakrishnan and Alfred, 2013). Adults who staying in rural area more are affected by their psycho well-being and mental health especially on COVID-19 pandemic (Rathakrishnan et al., 2019).

Finally, the fourth hypothesis found spirituality significantly mediated the relationship between fear of COVID-19 and mental health. This study affirms the importance of spirituality as a factor between fear and mental health. When spirituality values are high, people give less importance to emotion and become more focused on daily work. Even if people are experiencing social distancing and also having less social connectedness with their friends, family members, and colleagues, with spiritually, they can have faith and hope. This spirituality reduces their fear of disease. The result further shows that spirituality values could help people with fear to manage their mental health better. Spirituality makes them stronger in their relationship with fear and mental health. This result helps add to the overgrowing call for the mental health professional and counselor in hospital, school, and university. Fear of the disease can be reduced if spirituality well-being is imposed to increase positive mental health, especially throughout the COVID-19 pandemic. That means counselors and mental health professionals need to integrate spirituality well-being with fear and mental health. This spirituality values help adults to overcome fear, and it will increase positive mental health. Furthermore, this finding supports that counselor should consider spirituality values to reduce the number of people who have mental health and fear of COVID-19. An intervention to help adults who are having fear and mental health issue should focus on spirituality (Beckstein et al., 2021). This will help adults

to increase their belief and positive values to control their fear and mental health issues (Liu et al., 2020, Rathakrishnan and George, 2021). Another essential point is that counselors and mental health professionals need to understand the role of spirituality in the life of the client (Seybold and Hill, 2001; Miller and Thoresen, 2003; Koenig, 2010). Counselors need to understand how to integrate their client's spirituality values in their intervention and to help clients who have a fear of the COVID-19 and mental health issue. The process of intervention should focus on spirituality and values of positive well-being (Seligman, 2002).

Limitation

Justification in terms of location, time, or respondents' characteristics also needs to be taken care. This study has the characteristics of a pilot study due to the limited sample size of adults. There should be more data collected.

Improvement

In future, research also can focus on more respondents and gives important of value of spirituality on the mental health and what type of invention using spirituality could ease the mental health among adults. Thus, it could be interesting in future occasions to assess the use of measures on other aspects of spirituality or religiosity (closeness to God, religious support.) and even introduce qualitative methodology.

CONCLUSION

In conclusion, this study has identified the mediating role of spirituality in the relationship between fear of COVID-19 and mental health. The result demonstrated that there is a link between fear of COVID-19 and spirituality toward mental health. For future research, there is a need to conduct more research related to spirituality, fear, and mental health among people who are going through a COVID-19 pandemic. Fear of COVID-19 is an issue that needs to be explored to understand further about how it affects mental health among adults in Malaysia. Because people cannot be connected, it makes them more stressful and fearful of this disease. With more research and findings, there could be more counselors and mental health professionals who are culturally based and can tackle more issues related to mental health during times of a pandemic. This will help more counselors and mental professionals become well-equipped with more specific intervention methods for a pandemic.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Universiti Malaysia Sabah [JKEtika 3/20 (11)]. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

All authors listed have made a substantial, direct, and intellectual contribution to the work, and approved it for publication.

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Mental Health Staff Perspectives on Spiritual Care Competencies in Norway: A Pilot Study

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Spirituality and spiritual care have long been kept separate from patient care in mental health, primarily because it has been associated with psycho-pathology. Nursing has provided limited spiritual care competency training for staff in mental health due to fears that psychoses may be activated or exacerbated if religion and spirituality are addressed. However, spirituality is broader than simply religion, including more existential issues such as providing non-judgmental presence, attentive listening, respect, and kindness (International Council of Nursing [ICN], 2012). Unfortunately, healthcare personnel working in mental health institutions are not well prepared to address spiritual concerns or resources of their patients (Cone and Giske, 2018). Therefore, a mixed-method pilot study was conducted using a self-assessment survey tool to examine spiritual care competencies of mental health staff in Norway and to understand the perspectives of mental health staff in the Scandinavian context (Stockman, 2018). Five questions and comments related to survey items provided rich qualitative data. While only a small pilot with 24 participants, this study revealed a need for spiritual care educational materials targeted specifically for those who work in mental health, materials that address the approach of improving attitudes, enhancing skills, and increasing knowledge related to spirituality and spiritual care of patients.

Keywords: spirituality, spiritual care, competencies, mental health, nursing, mixed-method

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INTRODUCTION

According to Nolan et al. (2011), the spiritual domain is multidimensional, and it includes existential concerns, value-based issues, and transcendent considerations, including religion, faith, and view of life. Unfortunately, there is limited knowledge about the perspectives of those who work in mental health facilities. Spirituality is a large umbrella term accommodating existential phenomena such as love and connectedness (Rykkje et al., 2015), meaning and purpose (Balgopal and Montplaisir, 2011), and hope (Harley and Hunn, 2015), as well as transcendence (Walsh, 2010; Pargament, 2013; Weathers et al., 2016). However, many still associate spirituality only with religion (Saleem et al., 2014), particularly in Norway where this pilot study took place. The association between spirituality and religion is especially so in Scandinavian countries where there is a long history with Christianity as the dominant religion and the term has elements of the word for religion within it. Furthermore, even though the spiritual domain includes far more than religion (Nolan et al., 2011; Skevington et al., 2013; Weathers et al., 2016), many mental health clinicians

avoid spiritual and existential concerns because of the fear of activating a religion-related psychosis (Koslander et al., 2009; Ouwehand et al., 2014; Borge and Maeland, 2017; Neathery et al., 2020).

In their phenomenological study of spirituality in mental health, Tokpah and Middleton (2013) note that "spirituality is central to but forgotten in psychiatric nursing practice" (p. 81), which supports the earlier work of Swinton (2001). These findings are echoed by Norwegian researchers who point out that even though a person-centered, and whole person approach is being promoted in mental health care, spirituality is not yet a legitimated theme (Borge and Maeland, 2017). A large study done among psychiatric mental health nurses in the United States reported that the "most frequent barriers to providing spiritual care were lack of education and fear of exacerbating psychiatric symptoms" (Neathery et al., 2020 p. 370). There is a demonstrable need for more professional education on spirituality and spiritual care in mental health care because health care professionals working in this field lack competences in addressing spiritual concerns of patients (Helminiak, 2001; Saleem et al., 2014; Medås et al., 2017; Patterson et al., 2018; Neathery et al., 2020).

There are many sources of research showing an association between faith and positive health benefits such as coping with illness and faster recovery (Koenig et al., 2012). From a Scandinavian point of view, there have been critical voices to the mainly American research around faith and health due to the differences between how faith is practices and lived out in Scandinavia (Hvidt et al., 2020). Even though Scandinavia has 1,000 years of Christian history and most have had Lutheran state churches until recently, Scandinavian countries are seen as some of the most secular societies in the world (Hvidt et al., 2020). Although the majority of the population in Norway belongs to a Christian denomination (68% belongs to the Norwegian Church, and 7% to other Christian denominations [Statistics Norway, 2021a,b], church attendance is low, and it may seem like people live passive religious lives; thus, it is almost taboo to talk about religion (Giske and Cone, 2015; Kuven and Giske, 2019; Hvidt et al., 2020), which also means the many Scandinavians do not have a language to talk about their spiritual concerns.

Holmberg et al. (2021) point to the need to develop spiritual literacy amongst professionals in Norway, which is also discussed by others (Giske and Cone, 2015). However, when facing crisis and illness, many Scandinavians start thinking about God and reflect about their situation (Hvidt et al., 2017). Hvidt et al. developed two concepts that might be helpful in discerning what meaning religious faith might have in people's lives and how helpful their faith is for them in times of illness. "Restful religiosity" is used about people who rest intrinsically in their faith, where faith is internalized through identification and the person deeply hold the values of the religion. "Crisis religiosity" is used about people where challenging life events such as crises and illness increase their reliance on religion (Hvidt et al., 2017, 2020). Hvidt et al. (2017) ask the question if crisis religiosity has become the predominant form of religious expression in the Scandinavian population.

Koslander et al. (2020), also reporting from Scandinavia, found that patients who had been inpatient in psychiatric care described their experiences of spiritually as going beyond religion, even though religious experiences were part of it. Spirituality could provide resources such as hope, connectedness, meaning, and coherence in life, but also give rise to doubt, anxiety and feelings of loneliness, and hopelessness. Koslander et al. (2020) therefor advise mental health nurses to approach spirituality as a dialectic matter and being open to their patients, as spirituality often is in a dialectic relationship to each other as both a resource and a challenge. In one study exploring the relationship between religious and spiritual needs that are met versus unmet needs, van Nieuw Amerongen-Meeuse et al. (2020) found that it is very important for nurses and other mental health practitioners to give personalized attention to religion and spirituality in their conversations with patients.

Recently there has been more research related to the lack of preparation nurses report for addressing the spiritual domain with their patients (Ross et al., 2018) and the strategies being used to address this issue (Rykkje et al., 2021). A large study by van Leeuwen and Schep-Akkerman (2015) exploring nurse perceptions of spiritual care in Netherlands revealed that there are significant differences between health care settings (hospital care, mental health, home care) in almost all areas measured. They recommend that "nursing practice, nursing education, and nursing management should consider an emphasis on spiritual competence development related to working settings of nurses" (van Leeuwen and Schep-Akkerman, 2015, p. 1354). Moreover, even though mental health services currently focus on a recovery-oriented, person-centered approach, the spiritual domain is often neglected (Davies et al., 2019), and overall, there is limited research and specific education globally addressing spirituality and spiritual care in mental health facilities (Tokpah and Middleton, 2013; Saleem et al., 2014; Bitter et al., 2020).

This pilot study, planned and implemented by the authors as co-Primary Investigators (co-PIs), had two aims. First, we aimed to evaluate use of the Tool among mental health staff, and secondly to describe the views on spirituality and spiritual care of healthcare personnel working in a Norwegian mental health institution and to identify their knowledge, skills, and attitudes related to spirituality and spiritual care of patients in their workplace.

MATERIALS AND METHODS

Participants

This mixed-method pilot study was conducted at one mental health hospital in Western Norway by two researchers, one American and one Norwegian (the authors). Ethical approval for the study was discussed with Norwegian Data Protection Services. Since no personally identifiable data were to be gathered, informed consent was implied by a willingness to participate and staff returning the filled in survey to hospital leaders. A convenience sample of health care staff from five different wards were invited to take part in the survey; it must be noted that due to the pandemic, researchers were not able to do recruitment personally. Twenty-four healthcare personnel from different professional backgrounds (nurse, social educator, nurse

assistants, aides) returned the survey. Although several ward leaders were approached to help with recruitment, half of the answers came from one ward where interest in the topic was high. Demographic data are found in **Table 1**.

The Survey

The survey focused on spirituality in nursing care. The survey instrument is a recently developed and tested EPICC Spiritual Care Competency Self-Assessment Tool, hereafter called the "Tool," with parametric testing that showed its validity and reliability as an instrument. Developed from the EPICC[1] Spiritual Care Educational Competence (SCEC) Standard for bachelor students (McSherry et al., 2020; van Leeuwen et al., 2020), the Tool provides an opportunity to personally assess one's competencies, based on the elements of the EPICC SCEC Standard, and to evaluate one's growth when used again over time. The Tool includes 28 questions where participants can score their knowledge, skills and attitudes on a 5-point Likert scale addressing four areas of spiritual care competencies; (1) Intrapersonal spirituality, (2) Interpersonal spirituality, (3) spiritual care Assessment and Planning, (4) spiritual care Intervention and Evaluation. During its initial parametric testing after being developed, the Tool scored a very high Cronbach *alpha* (0.910), so it was determined to be reliable, and its validity was sound (Giske et al., 2022).

There are six demographic elements in the survey: profession, age, gender, further education, years working in mental health, and the ward where they primarily worked. After filling in the EPICC SCEC, participants were invited to write a short reflection regarding their own spiritual care competences. There are also five ending questions, two of which can be self-rated on a 1 to 5 Likert scale: (1) how important it is to be able to conduct a spiritual assessment, and (2) how well prepared they feel to conduct a spiritual assessment. Three other questions address the following: (3) have they had had any education in conducting a spiritual assessment, (4) how do they collect patient information to carry out a spiritual assessment, and (5) have they had experiences in supervising nursing students in following up patients spiritually. Four of these questions have a quantitative format as well as room for comments, so those numerical answers were added to the survey dataset for quantitative analysis. Lastly, participants were invited to share further comments if they wished. All written comments were analyzed qualitatively.

Data Collection and Analysis

The leaders of the hospital agreed to take part in the pilot, which is the first part of a bigger study where a Ph.D. student is conducting interviews regarding spiritual care with patients and later with staff at two of the wards in the hospital. The Norwegian co-PI delivered the survey to one of the nurse leaders who distributed them to five of the hospital wards. The completed questionnaires were placed in an envelope to be picked up by the co-PI (second author) after 5 weeks, in February 2021. We had hoped to have a higher number of surveys returned, but Covid-19 restrictions prevented us from personally recruiting or discussing the pilot with staff ourselves, so we had to rely on the identified gatekeepers. Reasons for the low response rate were later explained by the nurse leaders as due to two other studies going on at the same time, but the low numbers may have more complex reasons than that. Since this survey was a pilot study in this mental hospital where no spiritual care research had yet been done, we felt it warranted a voice in the research literature; hopefully, future research will be done on spiritual care in this and other mental health institutions in Scandinavia.

Data from the surveys were entered into a spreadsheet that was then imported into quantitative software, and the open comments were translated into English by the Norwegian co-PI for discussion and analysis by the two co-PIs. Of the questions at the end of the survey, numbers 1, 2, 3, and 5 were easily quantified and added to the SPSS dataset. The American co-PI analyzed the quantitative data using SPSS version 28, and a number of tests were run: *t*-test, ANOVA, chi-square, correlation, and factor analysis. The open comments from the survey as well as questions 3, 4, and 5 were analyzed using reflexive thematic analysis (Byrne, 2021). The co-PIs/authors used open coding followed by selective coding to analyze the comments separately, and we later discussed codes and themes together before agreeing on the final themes and sub-themes.

RESULTS

Quantitative Results

The quantitative results of the survey include a look at the reliability of the Tool in light of the resent psychometric testing done by those who developed the instrument. The American co-PI consulted with a statistician to make sure all tests were accurately done and evaluated. Additionally, the participant demographics, the four spiritual care competencies, and the four quantitatively focused questions were analyzed.

Demographics

The 24 participants answered the questionnaire with few areas of missing data. Every ward that was approached about the project had at least one or two participants, though one ward with an engaged leader provided half of the respondents. Additionally, 17 of the 24 had bachelor degrees in nursing (BSN) or in social education (BSSocEd), so the group had a high level of education as a whole. Only a quarter were male, but nursing is generally a female dominated profession, so that is not unusual. Most did not have preparation or training for spiritual care, and had uncertainty about how important it is in the care of mental health patients. While we asked for their age, we entered data as decades, and most were young adults (20–39 years old).

Evaluation of the Tool

While this pilot study had a small sample size (n = 24), the co-PIs thought it would be good to examine the psychometric results and compare findings from this pilot among mental health nursing staff with results from the original parametric testing of the Tool. Using the SPSS-28 software, the statistician consultant computed the overall Cronbach *alpha* (0.838) for the

[1] www.epicc-network.org

TABLE 1 | Demographic data.

Category	Variables and values				
Profession	BSN = 12	BSSocEd = 5	Other = 7		
Further education	Yes = 7	No = 15	Missing = 2		
Gender	Male = 6	Female = 17	Missing = 1		
Wards of work	S1 = 12	4 Others = 12			
Age in decades	20 s = 11	30 s = 8	40 s = 4	50 + = 1	
Years working mental health	Less than 2 = 4	2–5 = 9	6–11 = 3	12 + = 7	Missing = 1

Tool used in mental health, which for a pilot study is very good. While the evaluation of the Tool in mental health showed a high *alpha*, we thought it would be interesting to do an item analysis on each of the four competencies. This revealed that each of the four competencies had one question that scored quite low compared to the others within the subgroup. For Competency 1—Intrapersonal Spirituality, question 6 (of 7) was a complex question on Attitudes that addressed multiple concepts. When removed from that first competency, the *alpha* score of that competency went from 0.548 to 0.638. Competency 2—Interpersonal Spirituality had a complex Knowledge question (#2 of 5) that addressed both awareness of and impact of knowledge; removal of that item raised the Cronbach *alpha* score on that second competency from 0.556 to 0.661. Competency 3—Assessment and Planning of Spiritual Care again had an Attitudes question that was complex (#7 of 8), in that it combined several attitudes rather than simply addressing one. The score there moved from 0.667 to 0.699, a small but significant change. Finally, in Competency 4—Intervention and Evaluation of Spiritual Care, the second question in the Knowledge category (#2 of 8) was complex in that it addressed both patient needs and resources, which made it difficult to answer. The Cronbach *alpha* score moved from 0.677 to 0.724 on that last competency. These issues will be raised with the SEP Team that developed the Tool in case there is a real need for modification of the Tool, which is seen in its complete form in the article by Giske et al. (2022), for future use among students and nurses working in a variety of fields.

Quantitative Analysis of Survey Questions

The survey Tool was created with four competencies based on the idea of knowing yourself (1-intra-personal) and how you relate to others (2-inter-personal), and then about learning how to assess and identify a problem or need and to create a plan of care (3-assess/plan), as well as how to intervene with compassion and to evaluate, document, and modify a care plan (4-intervene/evaluate) with attitude, skills, knowledge addressed in each competence. It is interesting to note that in all four of the competencies, the skills questions scored well in factor analysis. Some questions on Attitudes (#6 in Competency 1 and #7 in Competency 3) were difficult to understand (Cone and Giske, 2018), so they had a lower score, while two Knowledge questions (2nd question in both Competencies 2 and 4) were complex and multi-faceted, which made them hard to answer.

What is quite interesting is that the most significant and strongest relationship among these variables is the one between personal, intra-spirituality and the healthcare provider's ability to intervene and evaluate the spiritual care given ($r = 0.819$, $p < 0.001$). Two other significant relationships between the competency scales that relate to intra-spirituality are with inter-personal spirituality ($r = 0.582$, $p = 0.003$) and with assessment and planning of spiritual care ($r = 0.472$, $p = 0.020$). This means that the more you know yourself and your beliefs, values, and what is important to you, the more able you are to facilitate spiritual care and to check and see if it was useful and successful or not.

It is interesting that the inter-personal spirituality element of spiritual care has a significant positive correlation to all the other scales, including the one to intra-personal spirituality mentioned above. Inter-personal spirituality also relates to spiritual care assessment and planning ($r = 0.487$, $p = 0.016$) as well as intervention and evaluation ($r = 0.596$, $p = 0.002$), which may, in some part be connected to the training in therapeutic communication that nurses receive and to the teamwork that nurses are encouraged to engage in when providing patient care (Institute of Medicine [IOM], 2010). Assessment and planning for spiritual care have only a moderately strong correlation to intra- and inter-personal spirituality, but these relationships are still very significant ($p < 0.05$). Attitudes, knowledge, and skills in spiritual care assessment and planning naturally relate to one's ability to intervene and evaluate in a strong and significant way, which also makes sense, but it is good to see this confirmed.

Questions at the End of the Tool

How Important Is Spiritual Assessment in Mental Health?

Due to the small sample size, no statistical significance was found with *t*-tests, though age revealed a difference between younger and older staff that approached significance. There was a relationship, again only approaching statistical significance, between bachelor-educated staff and the importance placed on the spiritual domain in mental health. This is also true of the question about how important spiritual assessment is and years of experience in mental health work. The ANOVA to determine differences between the importance of spiritual assessment and the four competencies showed that mental health staff who believe that spiritual assessment is important have a greater ability to work with each other (2-Interpersonal) and to conduct spiritual assessment (3-Assess and Plan) than those who do not (see **Table 2**). These differences were highly significant ($p = 0.022$ and $p = 0.029$, respectively).

TABLE 2 | Importance of spiritual assessment—ANOVA.

ANOVA					
Model	**Unstandardized coefficients**		**Standardized coefficients**	**t**	**Sig.**
	B	**Std. Error**	**Beta**		
(Constant)	−2.049	1.685		−1.216	0.240
Intra-spirituality	0.226	0.576	0.112	0.392	0.700
Inter-spirituality	1.171	0.492	0.500	2.379	0.029
SC-assess and plan	1.034	0.409	0.521	2.528	0.022
SC-evaluate and intervene	−0.896	0.677	−0.405	−1.324	0.203

Dependent Variable: Q1-How important is it for nurses and mental health workers to do spiritual assessment?

How Well Prepared Are You for Spiritual Assessment?

Chi-square tests revealed a linear association between years of work in mental health and a sense of preparedness for spiritual assessment, but most of the demographic elements do not have a significant relationship found through cross-tabulation of data due to the small sample size. When considering preparedness for addressing spirituality, it is interesting to note that there is a linear relationship between both groups of staff with bachelor other education as opposed to those with less or no formal training, which means that the more formal education you receive, the better prepared you are for spiritual assessment. The relationship between bachelor prepared nurses as opposed to other types of training approached significance with the sense of preparedness for spiritual assessment. This may be more related to the registered nurse's overall training in assessment of the whole person than to any spirituality education, since only three participants noted that they had some level of training related to spiritual care.

What Training Have You Received for Spiritual Assessment?

Most of the participants noted that they had not received training in spiritual assessment. With only 3 of 24 responding yes, the lack of specific spiritual care education that prepares staff in mental health in this domain is clear, but no quantitative tests were useful in exploring this further. Qualitative findings shed some light on this element.

What Experience Have You Had of Supervising Students in Spiritual Care?

This final question would show significance with a larger sample size, but clearly, those with bachelor education in nursing or in social sciences and education (n = 17 of 24) are the ones chosen to supervise students in clinical practice. A sample of 17 participants with a degree is not enough to demonstrate statistically significant differences or clear relationships. We can simply infer, from linear associations, that the more education one has, the more experience you may have with addressing the spiritual in patient-centered, whole person care and/or supervising students. This is an example of holding to high standards for clinical education and student supervision, which is clear in this sample of mental health staff.

Qualitative Results

Participants were asked one question to help them reflect on the tool and three other questions where they could comment on other aspects of spirituality and spiritual care. Reflexive thematic analysis (RTA) (Byrne, 2021) to identify and select codes was a useful approach to these open comments by mental health nursing staff. We will present our RTA findings for each of these questions, some of which had only a simple theme while others had sub-themes as shown below.

Personal Competencies

Staff were open and honest about reflecting on their competence in spiritual care after scoring themselves with the Tool. Fifteen of the 24 respondents addressed this question. Within their personal competence, four sub-themes emerged: the need for improvement, the environment in mental health, attitudes of healthcare staff members, and personal attributes of healthcare team members.

Need for Improvement

Half of the respondents who answered this question noted that they need improvement in the spiritual domain. A need for raised awareness was a common theme. Increased knowledge was also a need among staff. One noted that they are not religious and have little preparation for addressing the spiritual, while another reported being a "person of faith" and would like to improve being able to appropriately address such concerns with their patients.

Mental Health Environment

Many of the respondents note that their workplace is not the best environment for addressing the spiritual domain. Some say this is because many patients "have delusions related to religion or are in a crisis situation" so they need to be careful in how they address patients' beliefs and life views. Others report that there is little spiritual care focus at work, with one stating there is "little focus on the theme in the context of where I work." question.

Healthcare Team Attitudes

When considering the attitudes, skills, and knowledge approach to evaluating the spiritual domain with healthcare staff, it was interesting to note that awareness, knowledge, and skills in spiritual care need improvement, however, most respondents reported appropriate attitudes when considering the spiritual

care of their patients. One reported respecting their patients and patient "views of life, spirituality, and faith." Another noted always trying to "accommodate and facilitate for spiritual needs." One noted that it is easier to address when their personal values match those of their patient. A few mentioned that "existential questions" are good to discuss with their patients. Finally, several reported being open and wanting to talk about what is important to the patient and about what will help them improve.

Personal Attributes of Staff

This sub-theme may be a factor that underlies the generally open attitude of healthcare staff reported in this study. A few noted that their "inherent personality" and their own professional achievements help them address difficult topics. One mentioned "being a person of faith" and said they were concerned that "I might find it good to talk about existential questions/life view/faith and wish to be open about talking about such themes with those around me." Another shared "I use my personal experience from life in meeting people in crisis." Others reported that they are a little "distant" from the spiritual domain and do not think about it either at work or elsewhere.

Previous Preparation

The three participants who reported that they had had training in spiritual care assessment provided open comments. One said they had gone to a faith-based bachelor's program where there was an emphasis on spirituality and spiritual care. Two respondents noted that they read articles about the topic, and one had spiritual training unrelated to their profession. They do not explain what or where. It is interesting to consider whether the strong correlations found between the competencies in spite of a lack of preparation may be more related to their general nursing preparation than to any specific education in spiritual care.

Patient Assessment of Spirituality

Of the 24 participants who filled out the Tool, two participants reported that they do not assess spiritual issues at all, but 13 of them addressed the question on how they assess the deep, spiritual concerns of their patients. This is an amazing response in light of the lack of specific training in this domain. These staff appear to be very attuned to care of the whole person. Two sub-themes emerged.

Ways of Gathering Information

Within this sub-theme, communication was the key. Staff said they need to ask the patient directly about any issues that are spiritual in nature. This includes taking a history, observing carefully, listening well, and "mirroring" patient conversation so there is dialog where issues can be clarified for accuracy. Open-ended questions were seen as very effective and focusing on the future or next steps was a good approach with patients. Also mentioned is the location (not in public places) and timing (when they are alone with the patient) of these encounters.

Sources of Information

Participants reported that they use many sources in their assessment. The patient is important, but they also talk with colleagues and with family members to help them understand a specific patient issue, and some discussed reading materials that they searched for in books, articles, or on the internet. Documentation was mentioned as being another source of information. Talking with the priests and chaplains are also ways of gathering information about the patient and specific patient concerns.

Training Others

Only five of the 24 participants reported that they have had experience in guiding nursing students in the spiritual area, and they all commented on how they supervise students. Four of the respondents commenting were nurses, and one was a social educator. Two sub-themes emerged: Talking about the content and choosing the appropriate setting.

Talking About the Content

Staff talked about the theme of spirituality with students. One trainer reported that they reflect "together on existential questions and needs that come forth when one is seriously mentally ill," especially if the person was admitted by coercion due to the nature of the illness. The students can also consider the way ahead for the patient moving forward after a period of illness since recovery is the goal for these patients with mental health problems.

Choosing the Appropriate Setting

As for training in the clinical setting, the environment was noted as being very important. It is not appropriate to discuss such private things as spiritual concerns in a common room or where others can overhear the conversation; it would be better to talk with the patient in his or her room if the topic is important for them. One person also noted in a final comment that "Religion and life view are and shall not be a theme in the common areas of the ward as this, from experience, might cause discussions, misconceptions, disagreement." Students are encouraged to learn about and become familiar with the spiritual domain so that they are more comfortable with the topic and can address it with their patients when a patient raises such issues.

DISCUSSION

Usability of the Tool in Mental Health

The overall Cronbach *alpha* score (0.838) of the Tool among this sample of mental health staff is high, though not as high as the original testing of the Tool (0.910), which is published elsewhere. Factor analysis of the survey competencies showed that one question in each competency loaded with a very low score due to those questions addressing more than one concept or construct related to spiritual care. Since the goal of this pilot study was to evaluate its use among mental health staff rather than students, we encourage further development and modification of the Tool by its developers. These items reveal a weakness in the Tool that its developers will no doubt need to address at some future date.

The Cronbach *alpha* for this pilot was fairly high, which was consistent with its original parametric testing, demonstrating the overall reliability of this spiritual self-assessment tool. There

was a small positive gain when the lowest scoring items were removed, which is a point for the developers to consider as they examine the use of the Tool in a variety of settings. It is interesting to note that scores for the questions on Skills remain strong and are well understood across all competencies. The weakest questions on Attitudes in Competency 1 and 3 actually had multiple concepts within one question, making it hard to choose the best answer. Knowledge scored the lowest among the attitude, skills and knowledge subsets, which is not surprising when you note that very few of the participants had any further training that would help prepare them for spiritual care (see **Table 1**). Again, question 2 in both Competency 2 and 4 are complex questions, the first asking about awareness and impact, and the second about needs and resources, both of which are multi-faceted. Questions where the primary focus is hard to identify or those that include more than one concept or construct are difficult to answer in any survey. Modification of an instrument, which we recommend for this Tool, is part of an instrument's development into the most useful tool possible (DeVellis, 2012).

Implications From Demographic Data

It was important to us that we not include demographic data that could reveal participant identities, so we had only six questions. The issue of gender is not really a useful one since nursing is a female dominated profession, but men tend to move into the higher stress or intensity areas like intensive care, emergency nursing, and mental health (Evans, 1997). With one quarter of our sample being male, this fits into global patterns for nursing staff in mental health. Age and work experience had a strong and significant relationship to each other, which makes sense, but we also found that age and experience approached statistical significance in relation to understanding inter-personal spirituality and assessing patients spiritually. These findings emphasize the importance of personal maturity and work experience with teamwork. Moreover, connecting with others in a collaborative way to accomplish patient-centered spiritual care is critically important in mental health (Herrman, 2017; Milstein et al., 2017; Poncin et al., 2019).

Another interesting element of our sample is that one ward had half the participants. The recruitment efforts were made through the institutional leaders and the leaders of each ward. One ward leader was very interested in the study and encouraged staff on that ward to participate. This emphasizes the role of leadership in research where gatekeepers provide access to participants. Those who become engaged and interested in the project may recruit more participants; moreover, if we want role models in healthcare, leaders also need development (Jenkins et al., 2020). This has implications for researchers, especially in areas where limited studies have been conducted on sensitive topics or with particularly vulnerable people groups.

Educational Preparation for Spiritual Care

Most of the staff indicated a lack of training related to the spiritual domain. The qualitative findings revealed the need for raised awareness about spiritual care and especially regarding how to develop discernment of how and when to talk with patients in ways that could be supportive, even when patients are delusional or in crisis. The fear of harming mental health patients by opening up for or addressing spiritual and religions matters is well known from the literature (Koslander et al., 2009; Ouwehand et al., 2014; Borge and Maeland, 2017; Neathery et al., 2020). Health care staff in mental health hospitals who are working with very ill patients have an ethical and professional duty to develop knowledge, skills, and attitudes to assess and address their patients also in the area of spirituality; this domain is an aspect of whole person patient-centered care (Saleem et al., 2014; Medås et al., 2017; Patterson et al., 2018). In discerning how to assess patients spiritually, Koslander et al.'s (2020) advises mental health nurses that spirituality can be both a resource and a challenge and is worth noticing, acknowledging, and discussing among the healthcare team members. In a Scandinavian context, it might also be helpful to try to determine if patients have a restful religiosity that is deeply integrated into the person and thus might provide support in times of illness, or if there is some conflict related to their belief system. Crises religiosity, where illness might lead to increased religiosity has not proven to give the same comfort and health benefits as a steady faith or belief system (Hvidt et al., 2017, 2020).

This pilot study revealed that mental health staff with a bachelor's degree had a higher understanding of spiritual assessment and care even though just three reported to have had any training in spiritual care assessment. To interpret these fining is challenging as more staff might have had some training, but just did not remember it or they might not have considered it spiritual in nature. The high comfort with interpersonal spirituality may indicate that nursing education does a very good job of teaching nursing students therapeutic communication techniques as well as about the value of providing compassionate care and working together to give the best possible patient care. However, the findings do indicate a need for universities to prepare students in a way so that nurses can feel better prepared and that staff can be better role models for students (Kuven and Giske, 2019). Only five out of 17 participants who responded to the request for comments said that they supervised nursing students in assessing patients spiritually during their clinical studies in mental health. With the discernment needed for doing this well, these results call for an increased focus on supervision in spiritual care during students' placements and for more training that will integrate the spiritual domain into mental health care (Grams et al., 2007).

Continued Education in Nursing

The results showed that the better the staff know themselves, own beliefs and values, the more able they were to facilitate spiritual care for patients and too evaluate if the care given of help to patients or not. The importance of this finding cannot be overstated. Nurse educators and clinical leaders need to make

sure that staff have the opportunity to learn and encouragement to grow within themselves in order to be more able to help others in the spiritual domain.

Limitations

In addition to this pilot having a small sample size, which limits the ability to find statistically significant differences and/or relationships between survey items, the study was carried out at one site where there was not an evenly distributed number of people from each ward in the sample. Moreover, a factor analysis of the Tool itself, while indicating a strong reliability score that shows its relationship to the constructs of spirituality and spiritual care, demonstrates a need for modification and simplification of some questions. Additionally, qualitative data revealed some redundancy among the questions as well as a lack of clarity on the main point of some questions. Finally, survey tools rely on self-report, which has implicit bias.

CONCLUSION

Spirituality and spiritual care are important topics to address in mental health; however, there is limited research that addresses spiritual issues in mental health nursing. This pilot study evaluated the Tool for use among mental health nurses in a mental hospital setting, and the findings support that the Tool can be helpful in determining spiritual care competencies among mental healthcare staff. The caring attitudes and communication skills reflected in the responses is clear evidence that good nursing is whole person and patient centered. This pilot reveals a need for spiritual care educational materials that are targeted specifically for those who work in mental health, materials that address the approach of improving Attitudes, enhancing Skills, and increasing Knowledge related to spirituality and spiritual care of mentally ill patients. Moreover, for a relatively small pilot, the study demonstrated significant findings on what mental health personnel need to know and how they can better support their patients spiritually.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusion of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Norwegian Protected Data Services. Written informed consent for participation was not required for this study in accordance with the national legislation and the institutional requirements.

AUTHOR CONTRIBUTIONS

TG and PC: research design and planning, qualitative data analysis, and manuscript writing. TG: data collection. PC: quantitative data analysis. Both authors agreed to the final manuscript.

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Cognitive Health and Differential Cortical Functioning in Dissociative Trance: An Explorative Study About Mediumship

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Aim: To evaluate the cognitive functioning of subjects practicing trance mediumship in Brazil.

Method: The study was based on the measurement of cognitive functions of 19 spirits mediums through neuropsychological tests such as the Brief Cognitive Screening Battery (BCSB), the Verbal Fluency Test (FAS), the digit span test, the cube test, the five digit test (FDT) and an evaluation of mental health through scales such as the Beck Depression Inventory (BDI), the Self-Report Questionnaire (SRQ), and the Trauma History Questionnaire (THQ). The sample included the participation of spirit mediums divided into two groups. The more experienced group (MEG) with 11 subjects had more than 10 years of mediumistic practice, while the other less experienced group (LEG) with 8 subjects had 1–5 years of experience. The inclusion criteria were psychophonic mediums (who have the ability to communication when deceased beings communicate directly via speaking) with regular trance practices for at least one year. The data collected were analyzed using the SPSS statistical package.

Results: Regarding performance on the BCSB and digit span test, all subjects reached scores at the median or higher in comparison to standardized scores of Brazilians. Scores of 90% on the cube test and 42% on the FAS were reached in comparison to median or higher values, versus the median of standardized scores among Brazilians. On the FDT, we found statistical significance ($p = 0.038$) in the choice stage, with higher performance of subjects whose initial age of trance recognition occurred before 21 years old. On the BDI scale, no participant met the criteria for major depression. The SRQ showed an incidence of common mental disorders in 21% of the sample, which was more prevalent in the LEG ($p = 0.008$).

Conclusion: The cognitive functioning of subjects who practice trance mediumship in Brazil is associated with cognitive health. Executive dysfunction may be a tendency in LEG. However, an incidence of common mental disorders in the LEG was observed. Executive processing was higher in the subgroup with early practices of recognizing the phenomenon.

Keywords: mediumship, cognitive function, cognitive health, Brazil, dissociative phenomenon

INTRODUCTION

Mediumship is a spiritual phenomenon displayed in different cultures and religious traditions; it has been reported throughout the history of humanity, where a person claims to communicate with deceased people (Moreira-Almeida et al., 2008). In this situation, there are reports that associate this phenomenon with the total and/or partial loss of consciousness (Bastos et al., 2018) and the ability to make judgments. Rituals in various forms are regularly performed in both religious and non-religious contexts, and numerous cultures around the world believe that this form of communication provides truthful information (Wahbeh et al., 2019).

Mediumistic experiences are usually dissociative, such as motor automatisms that involve writing, sensory, cognitive language, or more complex situations such as in "possession" (Peres et al., 2012). These are understudied cultural phenomena. Although nonpathological dissociation is quite common in the general population, dissociative experiences are studied as a risk factor for dissociative disorder or pathology (Facco et al., 2019). The DSM-5 states that such dissociative experiences should not be viewed as inherently pathological (American Psychiatric Association, 2013). In some studies, essential differences between dissociative disorder and mediumship were 221 verified, in which mediumship was considered to be a nonpathological form of dissociation (Mainieri et al., 2017; Vencio et al., 2019) and a protective factor against mental health conditions (Moreira-Almeida et al., 2008). In this research, Moreira-Almeida et al. studied 115 Brazilian mediums and showed adequate mental health in this group.

Analysis of cognitive performance, associated with dissociative experiences, is scarce in the literature. There is only one publication that has demonstrated neuropsychological findings, focusing on the evaluation of cognitive functions in people with altered states of consciousness (Al-Adawi et al., 2019). This study revealed executive dysfunction in so-called "spirit possession" among practitioners of only one type of trance mediumship.

Dissociation is commonly understood as a kind of built-in defense mechanism that allows individuals to psychologically protect themselves from extreme emotions and excitation triggered by a traumatic event (Vinhosa Bastos et al., 2018).

Thus, diagnosed executive dysfunction may result from a higher prevalence of traumatic experiences, from the difference between trance and possession regarding the preservation of frontal circuits, or from the quality of thought content during trance. Hence, there is a need to analyze the cognitive performance of subjects in other populations with different subtypes of trance beyond possession. The main research question is if mediumistic trance practice may impair the cognitive process. Our research hypothesis is that practitioners of mediumistic trance have preserved cognitive performance.

Therefore, we aimed to evaluate cognitive health among practitioners of mediumistic trance. In addition, cognitive performance and cortical functioning can be evaluated by focusing age of the person when the experience occurred, mental health comorbidities (such as previous traumatic experiences), and early recognition of mediumship according to milestones for neuronal specification.

METHODS

Nineteen—19 subjects completed all steps of this research; they were native Brazilians without residence abroad who regularly participate in religious activities of Kardecist Spiritism. Spiritism is a faith of which approximately 3 million Brazilians are reported to be followers (Instituto Brasileiro de Geografia e Estatística, 2010), and has intrinsic cultural components in which some of its members report having dissociative, mediumistic trance experiences. Research authorization was granted by the local Research Ethics Committee (#3.922.991). The study complied with the Declaration of Helsinki, with Brazilian legislation of resolutions 466/12 and 510/16 regarding research involving human beings.

Study Setting and Participants

The research was carried out in cities in the northeastern region of Brazil. The recruitment of participants was performed using the snowball sampling strategy, a technique in which a participant indicates another who meets the necessary requirement to participate. This is a non-probability sampling method that can be useful when the researcher is not able to known the number of persons with this ability in the population. The study staff did not known the participants identify during sociodemographic questionnaire applying. They only received their identity in order to complete the cognitive testing.

Nineteen psychophonic mediums who regularly attended Spiritist centers were included. These subjects reported having the ability to communication when deceased "beings" communicate directly via speaking. After initial selection, the subjects were divided into two groups. The first was considered to be the more "experienced" group (MEG) with 11 subjects, while the second was considered to be the less "experienced" group (LEG) with 8 subjects. Experience was defined by the length of time they had practiced mediumship (weekly or monthly). For the MEG, more than 10 years and a minimum of 1 trance activity per week were taken into account. For the LEG, 1–5 years of practice and up to 4 practices of the phenomenon per month were accepted. The period between 6 and 9 years was considered intermediate (the intermediate group).

Subjects who were absent from the activities developed in the Spiritist centers for more than 1 year were excluded, as well as those with decompensated psychiatric disorders (depression, schizophrenia), reports of sleep disorders (such as parasomnias, REM sleep behavioral disorder), a diagnosis of epilepsy according to the criteria of the International League Against Epilepsy (ILAE), subjects on psychoactive medications, reports of drug use or abuse, and subjects in the intermediate group.

A comparison of neuropsychological performance between the MEG and LEG was performed to analyze the differences in cortical processing. In previous studies with

neuroimaging in meditation using the mindfulness technique, different patterns of cortical activity and higher speed in executive processing have been observed depending on the years that subjects had previously practiced meditation (Falcone and Jerram, 2018).

Procedures

The data from the sociodemographic questionnaire were collected using Google forms; the participant's identity and any form of identification were concealed. The following data were requested: date of birth, gender, level of education, profession/occupation, ethnicity, and marital status.

For the purposes of inclusive criteria, they were asked about the ability to enter into a mediumistic trance, especially in laboratory and scientific research environments; the period when they started practicing mediumship; what type of mediumship they practiced (psychophonic, psychographic, clairvoyant); how often they entered into a mediumistic trance, weekly and/or monthly; and how the participant characterized their state of consciousness during mediumistic communication (conscious, semiconscious, unconscious).

To verify the exclusion criteria, they were asked about the existence of previous diseases; if they continuously and/or daily used psychiatric medications; if they had ever had a seizure or sleep disorder; and if the time of mediumistic practice corresponded to the intermediate period of 6–9 years.

Due to the COVID-19 pandemic, we sought to preserve the participants' health by maintaining face-to-face contact only for the application of neuropsychological tests. Thus, some instruments were adapted to an online format via Google forms: The informed consent form, the Beck Depression Inventory (BDI), the Self-Report Questionnaire (SRQ), and the Trauma History Questionnaire (THQ) were used exclusively for research purposes. After verifying the inclusion criteria, neuropsychological tests were applied, and cognitive functions were evaluated.

Cognitive Assessment

All tests and scales used have been validated and/or studied for use in the Brazilian population, so the scores obtained were compared with the values from standardized tables and their respective cutoff points, as well as stratification of the subjects according to expected scores for age and education. A rationale for choosing the cognitive and mental health tests/questionnaire was the use of tests that allowed analyzing each cognitive domain and diagnosing cognitive impairment accurately.

The **Brief Cognitive Screening Battery** (BCSB) is a battery of tests for the evaluation of perception/identification, naming, incidental memory, immediate memory, and late memory (Nitrini et al., 2004). To evaluate perception and naming, the participant was presented with a sheet of paper containing 10 images and asked to name each image. The numbers of items evoked provided the late memory score (1–4: below average; 5: average; 6–10 above average).

The verbal fluency test (FAS), considered "interference" in the previous battery, was applied. The FAS test was used to request the production of words obeying the initial letter rule. In addition to assessing components of executive function, it can measure the ability of controlled oral word association. The total score was given by summing all correct words beginning with the three letters (F, A, S); for statistical analysis, the score obtained was converted into percentiles (5–25: below average; 50: average; 75–95: above average) (Marquine et al., 2021).

The BDI is a self-assessment scale consisting of 21 groups of statements where depressive characteristics/attitudes and symptoms are quantified. Each category describes a specific behavioral manifestation of depression (Beck et al., 1961). The diagnosis of major depression will be categorized with a BDI $>$ 19 points.

The **SRQ** is a self-report questionnaire (Harding et al., 1980) validated for the Portuguese language (Mari and Williams, 1986). It consists of 20 questions designed to identify common mental disorders at the primary care level, which are characterized by non-psychotic symptoms such as insomnia, fatigue, irritability, forgetfulness, difficulty concentrating, and somatic complaints (Oliveira Bernardes Santos et al., 1970). Eight or more positive answers (yes) suggest the presence common mental disorders.

The THQ is a self-report questionnaire adapted to Portuguese (Fiszman et al., 2005), composed of 24 questions with "yes" or "no" answers divided into three fields: 4 questions related to traumatic situations involving crimes, 13 questions related to trauma in general and disasters, and 6 questions related to the experience of physical and/or sexual violence. For the purpose of this statistical calculation, we used the number of "yes" answers.

The **digit span test** is one of 15 subtests of the *Wechsler Adult Intelligence Scale* (WAIS), which was developed as a measure of attention, concentration, and memory (Glassmire et al., 2016). On this test, progressive sequences of numerals were presented orally, whereby the examinee reproduced them immediately after the presentation. The test is applied in two stages. In the first or direct stage, the examinee repeats the sequence of digits in the same order as presented. In the second, or indirect, stage, the digits are reproduced in the opposite order to the one presented by the examiner. The score considered for statistical analysis will be the weighted score (0–19) obtained from the absolute number of digits repeated (0–6: low performance; 7–12: average; 13–19: above average).

The **Wechsler Abbreviated Scale of Intelligence** (WASI) is a brief, reliable measure of intelligence in clinical and research contexts. It can be applied to people aged 6–89, and provides scores for verbal IQ, performance IQ, and total IQ. It is composed of four subtests: vocabulary, cubes, similarities, and matrix reasoning. The cubes subtest was chosen because it assesses skills related to spatial visualization, visuomotor coordination, and abstract conceptualization (i.e., it gauges perceptual organization and general intelligence) (Hilsabeck et al., 2003). On this subtest, the participant uses the cubes to reproduce 13 two-color models within a given time period, which progress in increasing difficulty, starting with two cubes, the simplest, up to nine cubes, the most complex. The score considered for statistical analysis will be the score (0–6: low performance; 7–12: average; 13–19: above average) obtained from the absolute number of digits repeated.

The **five digit test** (FDT) evaluates an individual's speed and mental efficiency in any language. It is a test of cognitive functions

based on simple linguistic concepts: reading digits from 1 to 5, counting elements from 1 to 5, and producing words using the quantities "one," "two," "three," "four," and "five." The FDT has four stages associated with different cognitive processes that can be grouped into automatic (reading and counting) and controlled (inhibition and choice) processes; these provide information about certain mental processes: (1) the overall speed of cognitive processing; (2) verbal fluency (i.e., the ability to find the words one wants to say); (3) the participant's focused attention and his/her reaction to continued effort; (4) the participant's ability to muster the additional cognitive effort needed to control involuntary responses and switch between two different mental operations. The score considered for statistical analysis will be the score obtained for reading, counting, inhibition, choice, flexibility, and inhibition in percentiles (5, 25, 50, 75, 95). To categorize them, 5–25 percentiles are below average, 50 on the average and 75–95 above average.

DATA ORGANIZATION AND STATISTICAL ANALYSIS

The data collected were tabulated in Microsoft Windows Excel and analyzed with the help of the SPSS statistical software package version 20.0 (IBM Corporation, Armonk, United States). Windows Excel tables were used to characterize the participants' profiles and the sociodemographic questionnaire.

The performances in neuropsychological tests were categorized as below or above the mean according to previously validated means to the Brazilian population. These performances were defined as dependent variables. The independent variables were socio-demographic variables (group type, gender, age, schooling time, and marital status). A ROC curve defined age and schooling time categories after visual choices looking for the best areas under the curve. The chi-square test and its complementary tests (Fisher or Likelihood ratio test) evaluated the difference between the MEG and LEG and the relevance of the results collected on the neuropsychological tests. Differences were considered significant at $p < 0.05$.

RESULTS

Sample Characteristics

The participants had a mean age of 45.1 ± 9.8. The mean age at which the manifestation of mediumship was perceived was 21.4 ± 12.9 years. The sample was 68% female and 32% male.

There were 8 individuals in the LEG, representing 42% of the sample, and 11 in the MEG, denoting 58%. Regarding the level of consciousness during the mediumistic trance state, 58% were conscious, 32% were semiconscious, and 11% were unconscious. Those who reported being unconscious belonged to the MEG group.

As for level of education, 37% of the participants had up to 12 years of schooling, and 63% had 12 or more years of schooling. Regarding marital status, 37% were in a stable relationship, and 63% lived alone or with relatives.

Psychiatric Findings

The SRQ showed an incidence of common mental disorders in 21% of the sample ($p = 0.008$, chi-square test), all belonging to the LEG, according to **Table 1**.

Using the BDI, major depression was ruled out in 100% of the subjects. On the THQ, 100% of the sample mentioned having experienced at least one traumatic event, 10% had only experienced trauma related to crime events, 26% had only experienced trauma in general and during disasters, 31% had experienced situations related to crime and trauma in general, and 31% had experienced trauma related to physical and/or sexual violence. Those who experienced physical/sexual violence had also experienced all other events, as shown in **Table 2**.

Cognitive Performance

In the evaluation of cognitive functions, on the BCSB, 100% of the subjects exhibited scores in the average and/or above average range at the end of the test, which evaluates late memory. The same outcome was found on the digit span subtest of the WASI; 100% of the subjects performed above or equal to the average found among Brazilian individuals. On the cubes subtest, 90% of the subjects scored higher than or equal to the average. On the FAS (verbal fluency) test, only 42% of the subjects scored higher than or equal to the Brazilian average (31% in the MEG and 10% in the LEG), as seen in **Table 3**.

On the FDT test, in the evaluation of the automatic processes that involve reading and counting, 53% showed percentiles equal to or higher than the average, of which 64% belonged to the MEG. In the controlled choice process, 68% had percentiles equal to or higher than the average; of these subjects, 64% belonged to the MEG. When the FDT subtest named controlled choice process was performed, there was statistical significance related to the

TABLE 1 | Frequencies of participants showing common mental disorders by Self Report Psychiatric Screening Questionnaire (SRQ) with respect to the group and the socio-demographic variables in subjects practicing trance mediumship.

Variables	*n*	SRQ		
		≥8	<8	*p*
Group type				0.008
LEG	8	4	0	
MEG	11	0	15	
Gender				0.75
Female	13	3	10	
Male	6	1	5	
Age*				0.906
<21	10	2	8	
≥21	9	2	7	
Schooling time (years)				0.188
≤12 years	7	1	6	
> 12 years	12	3	9	
Marital status				0.539
Cohabits with partner %.	7	2	5	
Lives alone or with relatives	12	2	10	

**Early age of perception of mediumship.*

TABLE 2 | Performances in Trauma History Questionnaire (THQ) and Beck Depression Inventory (BDI) scales with respect to group and socio-demographic variables in subjects practicing trance mediumship.

Variables	*n*	THQ						BDI	
		Crimes	*p*	General trauma	*p*	Physical and sexual	*p*	Depression	No depression
Group type			0.345		0.202		0.636		
LEG	8	0		8		2		0	8
MEG	11	2		9		4		0	11
Gender			0.637		0.310		0.911		
Female	13	0		11		4		0	13
Male	6	0		6		2		0	6
Age*			0.701		0.115		0.405		
<21	10	0		10		4		0	11
≥21	9	1		7		2		0	8
Schooling time (years)			0.210		0.289		0.677		
≤12 years	7	1		6		1		0	7
>12 years	12	0		11		5		0	12
Marital status			0.865		0.253		0.419		
Cohabits with partner %.	7	0		7		3		0	7
Lives alone or with relatives %	12	1		10		3		0	12

**Early age of perception of mediumship.*

age of perception of mediumship, with $p = 0.038$—chi-square test (**Table 4**).

Regarding performance in controlled process alternation, 63% had a score higher than or equal to the average; of these subjects, 45% belonged to the MEG. In the evaluation of inhibitory control, 58% had a score higher than or equal to the average, and 45% belonged to the MEG. On the cognitive function of flexibility, 74% had a score higher than or equal to the mean, and 64% belonged to the MEG.

DISCUSSION

The present study performed a broad neuropsychological evaluation of subjects who regularly participate in cultural or religious activities in which they experience dissociative mediumistic trance phenomena. The results were able to suggest cognitive health regarding the different cognitive domains evaluated: executive functioning, memory, visuospatial functioning, attention, and language. In addition, an exploratory analysis was performed that included comparisons between subjects with regard to descriptive epidemiological variables of the sample, and the same analysis was stratified into subgroups according to the time of recognition and perceptions of mediumship.

Worse performance was observed in brief psychiatric assessment scores in the LEG. The depression scores of both groups validated the findings in the following neuropsychological evaluation. Both groups performed above the average related to the population regarding the tests assessing visuospatial functioning and memory. Concerning the tests that evaluated frontal processing, there was a tendency for the MEG to perform better than the general population average in the following modalities: cognitive flexibility, the automatic processes of reading and counting, and the controlled process of choice. Subjects who experienced dissociative mediumistic trance phenomena before the age of 21 exhibited above-average frontal cortical processing in the choice control scores, which was statistically significant.

Mental Health in Dissociative Mediumistic Trance

In a comparative study between mediums and individuals with dissociative identity disorder, mediums differed from persons with dissociative identity disorder, indicating better social adjustment, lower prevalence of mental disorders, lower use of mental health services, no use of antipsychotics, a lower prevalence of histories of physical or sexual abuse in childhood, and sleepwalking (Moreira-Almeida et al., 2008). As a result, mediumship stood out, demonstrating better mental health and social adjustment. Other research compared spiritualist mental mediums to non-medium spiritualists. It suggested that mediums had better psychological wellbeing and reported lower psychological distress (Roxburgh and Roe, 2011). Another study with 3,023 participants suggested that individuals who claimed mediumship had higher dissociation scores than non-claimants, but neither group exceeded the threshold for pathology (Wahbeh and Radin, 2017).

According to Bastos et al. (2018), during mediums' training, prior to communicating with dead individuals, one of the most important skills to be acquired is control over the manifestations of possession. There is a role of learning this control of the possession phenomenon, which focuses on reading and education, as to the principles of the spiritism and behavioral adjustment to cultural rules (Espirito Santo, 2010). This process reflects broad acquisition and application of aspects of executive processing, with inhibitory control over

TABLE 3 | Performances in FAS, CUBES, DIGITS subtest with respect to group and socio-demographic variables in subjects practicing trance mediumship.

Variables	*n*	FAS			CUBES			DIGITS			BCSB—Late M.		
		<mean	≥mean	*p*	<mean	≥mean	*p*	<mean	≥mean	*p*	<mean	≥mean	*p*
Group type				0.198			0.763			0.348			0.228
LEG	8	6	2		1	7		0	8		0	8	
MEG	11	5	6		1	10		0	11		0	11	
Gender				0.127			0.412			0.943			0.13
Female	13	6	7		2	11		0	13		0	13	
Male	6	5	1		0	6		0	6		0	6	
Age*				0.845			0.277			0.596			0.33
<21	10	6	4		0	10		0	10		0	10	
≥21	9	5	4		2	7		0	7		0	9	
Schooling time (years)				0.598			0.36			0.198			0.556
≤12 years	7	5	2		1	6		0	7		0	7	
>12 years	12	6	6		1	11		0	12		0	12	
Marital status				0.361			0.405			0.891			0.179
Cohabits with partner %	7	5	2		0	7		0	7		0	7	
Lives alone or with relatives %	12	6	6		2	10		0	12		0	12	

**Early age of perception of mediumship.*

TABLE 4 | Performances in five digit test (FDT) test with respect to group and socio-demographic variables in subjects practicing trance mediumship.

Variables	*n*	FDT															
		AP. reading			AP. counting			CP. choice			CP. alternance			Inibition			Flexibility		
		<mean	≥mean	*p*	<mean	≥mean	*p*	<mean	≥mean	*p*	<mean	≥mean	*P*	<mean	≥mean	*p*	<mean	≥mean	*p*
Group type				0.432			0.307			0.763			0.095			0.425			0.507
LEG	8	5	3		5	3		2	6		1	7		2	6		1	7	
MEG	11	4	7		4	7		4	7		6	5		6	5		4	7	
Gender				0.667			0.5			0.988			0.895			0.664			0.634
Female	13	7	6		7	6		4	9		5	8		6	7		3	10	
Male	6	2	4		2	4		2	4		2	4		2	4		2	4	
Age*				0.084			0.067			0.038			0.081			0.063			0.723
<21	10	6	4		7	2		1	9		2	8		2	8		2	8	
≥21	9	3	6		2	7		5	4		5	4		6	3		3	6	
Schooling time (years)				0.579			0.888			0.909			0.676			0.125			0.22
≤12 years	7	5	2		5	2		2	5		2	5		3	4		3	4	
>12 years	12	4	8		4	8		4	8		5	7		5	7		2	10	
Marital status				0.652			0.78			0.283			0.119			0.839			0.589
Stable relationship %	7	4	3		4	3		2	5		3	4		3	4		1	6	
Lives alone or with relatives %	12	5	7		5	7		4	8		4	8		5	7		4	8	

**Early age of perception of mediumship.*

the possession phenomenon, as well as cognitive flexibility for changes in relation to the trance state and readjustment to the real environment.

Spirit possession cannot be considered pathological in relation to mental health, except when it causes clinically significant discomfort and impairment in social and occupational functioning (van Duijl et al., 2010). However, in this study, a difference was found in the prevalence of common mental disorders only in the LEG (i.e., in the group with less time of regular study and systematic activities aimed at controlling mediumship). It is inferred that the regularity of practices in the cultural and religious aspects of this practice may favor the concept of spirit possession as a phenomenon and not a disorder.

Another study suggested that performance on the verbal fluency test was significantly different among participants with intermittent dissociative phenomena when compared to transient dissociative phenomena (Al-Adawi et al., 2019). Such a finding did not corroborate the current study's outcomes. Although 58% of the participants scored below

average on the FAS test, there was no statistical significance between the groups. However, a below-average performance only on the FAS test—which was not observed in the digit span test and in all FDT subtests—makes executive dysfunction unlikely, even when stratifying the groups into MEG and LEG. It is hypothesized that the cognitive impairment observed in the study by Al-Adawi et al. (2019) may be related to the thought content experienced during possession phenomena.

Brain areas associated with the preservation and learning of memory, attention, and executive functioning tend to be dysfunctional in people with dissociative phenomena (Cima et al., 2001). Dissociation can be characterized by subtle deficits in neuropsychological performance, such as attention impairment, and some cognitive phenomena associated with dissociation seem to be dependent on the emotional or attentional context (Giesbrecht et al., 2008). However, in general, the mediums in this study exhibited scores within the Brazilian average on neuropsychological tests for the assessment of long-term memory, working memory, visuo-constructive ability, and planning. It is necessary to differentiate dissociative disorder from dissociative phenomena related to cultural experiences. Cognitive health also seems to follow this trend.

The fast, efficient reproduction of a series of elements on the FDT test indicates not only the presence of focused attention, but also the ability for automatization, learning, resistance to fatigue, and inhibitory control (Broverman et al., 1966). In the choice process, several variables are verified at the same time: attention, phonology, semantics, control, and inhibition of one response and activation of another. In our study, there was statistical significance between the age the medium began to exhibit mediumistic abilities and their scores within the choice process (a lower age of onset was associated with a higher score in this FDT subtest). We are unaware of studies that address such a comparison. There is probably a greater cortical susceptibility to the dissociative mediumistic trance phenomenon in some subjects, or the learning process and cortical specialization are facilitated by the early onset of mediumistic recognition. The phenomenon of neuronal pruning occurs until the age of 21, and is fundamental in the specialization of the functionality of individuals and preparation for the cognitive challenges that the individual will come across (Holguera and Desplan, 2018).

Mediumistic trance can be understood as a form of mediation in which an individual voluntarily access degrees of states of conscious. Both strategies (meditation and trance) may allow the subjects to access their ego-conscious (Wahbeh et al., 2019). Some studies showed an improvement in cortical activity by meditation using the mindfulness technique (Tanaka et al., 2014; Taren et al., 2017; Wang et al., 2020). Functional MRI neuroimaging studies have shown a change in the pattern of cortical activation between less experienced and more experienced mediumship practitioners. While human insula activation is observed in less experienced meditation practitioners, more experienced meditation practitioners activate areas of the right medial frontal gyrus, anterior cingulate gyrus, globus pallidus, and putamen (Falcone and Jerram, 2018).

In Brazil, the study conducted by Peres et al. (2012) with psychographic mediums (communication with deceased beings through writing) showed that among more experienced mediums, who wrote while in the trance state, cerebral blood flow was consistently lower in the regions responsible for complex writing compared to the control condition. During the mediumistic trance, there was low activity in the brain areas responsible for complex writing in the MEG. In this PET study, the more experienced mediums reported deeper trance states in contrast to the less experienced mediums. Cortical neuroimaging changes can be further detailed by thorough neuropsychological evaluation. In the present study, there was a tendency for better performance on tests that assessed subgroups of frontal tasks, suggesting better executive processing associated with the practice of dissociative, mediumistic trance phenomena.

STRENGTHS AND LIMITATIONS

This study has strong points: Provides insight that may help understand cognitive skills in practitioners of mediumistic trance. Contradicts previous findings from Al-Adawi et al. (2019) because an executive dysfunction was highly prevalent in practitioners of possession, and seeks to support future studies to define the risk of cognitive impairment in practitioners of mediumistic trance.

This study has limitations related to its design. As cross-sectional research, we may only describe frequencies and associations. A study with a prospective design may suggest an independent risk of cognitive impairment in practitioners of mediumistic trance. We presented a small sample of subjects because a broad neuropsychological assessment is challenging in volunteers. Small sample sizes usually have low statistical power, less precise estimations of the population parameters, and inaccurate generalization inferences regarding the reference population. Further studies could analyze the quality of emotions and thought content associated with this dissociative phenomenon. It may explore the depth of the mediumistic trance and the level of consciousness during it, comparing different groups looking for differences beyond trance and possession. Functional neuroimaging studies with cognitive tasks aimed at executive functioning may clarify some limitations.

CONCLUSION

Religiosity and its relationship with the unknown have always aroused interest, curiosity, fear, and distrust in many people. Thus, science has been developing ways to prove and/or question what has traditionally been believed through faith (Moreira-Almeida et al., 2008; Tanaka et al., 2014; Taren et al., 2017; Wang et al., 2020).

Through the analysis of religiosity, cultural manifestations can interfere with cortical functioning and cognitive health. The present study revealed that the cognitive functioning of Brazilian mediums, whether with much or little experience in activities related to this cultural experience, was equal to or above the average value considered normal for the Brazilian population.

In general, there was cognitive health among Brazilians who practiced trance mediumship as a cultural experience. However, we observed a higher prevalence of psychiatric impairment in the LEG, and executive dysfunction may be a tendency in LEG. Performance in processing in the frontal cortex was better in the subgroup with early onset of recognition of the mediumistic phenomenon. Diagnosed executive dysfunction may result from a higher prevalence of traumatic experiences, the impairment of frontal circuits on LEG, or the quality of thought content during trance.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Facid Research Ethics Committee #3.922.991. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

KA and KS-R: conceptualization, methodology, resources, and writing—review and editing. RR: data curation and formal analysis. KS-R, CC, AR, and SS: investigation and writing—original draft. KA: project administration and supervision. KA, KS-R, and RR: validation and visualization. All authors contributed to the article and approved the submitted version.

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Somatic Symptoms: Association Among Affective State, Subjective Body Perception, and Spiritual Belief in Japan and Indonesia

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This study aimed to examine differences in the following somatic symptoms: affective state (i.e., health concerns, anxiety, and positive and negative affect), somatosensory amplification, spirituality in Japan and Indonesia, and associations among all variables from each culture. Previous studies and a potential bio-psycho-spiritual model has identified the association of each variable in the development of somatic symptoms. Moreover, they demonstrated that individuals who describe themselves as more religious and spiritual report better physical and mental health. A total of 469 and 437 university students from Japan and Indonesia, respectively, completed the questionnaires for assessing somatic symptoms, health concerns, trait anxiety, positive and negative affect, somatosensory amplification, and spiritual belief. This study found significant differences in health concerns, positive and negative affect, state anxiety, and spiritual belief. Moreover, the difference in somatosensory amplification was negligible. There is a shared association in both cultures among somatic symptoms, affective state, subjective body perception, and spirituality. Health concerns and trait anxiety moderated somatosensory amplification in the development of somatic symptoms. However, the role of spirituality belief in somatic symptoms was observed in the Japanese and Indonesian cultures in relation to positive affect.

Keywords: somatic symptoms, health concerns, trait anxiety, positive affect, negative affect, somatosensory amplification, spirituality

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INTRODUCTION

Somatic symptoms are a frequent indication of emotional distress with or without a physiological basis. People frequently complain of headaches, chest pain, elevated heart rate, and other symptoms visit a general practitioner or medical facility. Moreover, somatic symptoms are key features of somatization disorder or somatic symptom disorder, where depression disorder can potentially manifest into somatic complaints (American Psychiatric Association, 2000, 2013). Such complaints differ from psychosomatic symptoms, such as duodenal ulcers or hypertension, which can be detected physiologically (Kawanishi, 1992).

Somatic symptoms tend to be influenced by biological, psychological, and social factors as well as spirituality. The biopsychosocial disease model provides a framework for understanding the complex interrelationship between spirituality and somatic symptoms (Engel, 2012). Moreover, the gate control/neuro-matrix theory of pain (Melzack and Wall, 1965; Melzack, 1999) describes the influence of biological, psychological, and social factors on the pain experience of an individual through pathways descending from the brain. The theory acknowledges bidirectionality in the relationship of pain with cognition, emotion, and behavior (Rush et al., 2020). The biopsychosocial model and gate control/neuro-matrix theory identify psychosocial variables as potential mediators and moderators of the pain experience. As such, previous studies identify several psychosocial mediators, such as mood, anxiety, social support, self-efficacy, and coping strategies (Rush et al., 2020).

Essential affective state factors in the development of somatic symptoms are health concerns or health anxiety. It manifests as disproportionate and persistent thoughts about the seriousness of one's somatic symptoms, persistently high levels of anxiety about health or bodily symptoms, and excessive time or energy devoted to such symptoms (American Psychiatric Association, 2013). Studies that investigated the psychological factors associated with somatic symptoms claim that such symptoms were significantly correlated with overall subjective distress like negative affect—but not positive affect (Watson et al., 1988). Specifically, individuals with high scores in negative affect complain of frequent somatic symptoms (Pennebaker, 2000). Research also establishes a link between anxiety, especially health anxiety, and somatic symptoms (Maulina, 2017). This link suggests that a negative mood state may inhibit immune function and, as a result, increase vulnerability to disease and elicit somatic complaints (Leventhal et al., 1996). The relationship between somatic symptoms and emotions is correlational and may be causal to a certain degree (Pennebaker, 2000).

Moreover, somatosensory amplification plays a significant role in the emergence of somatic symptoms, where empirical findings support its association with negative affect. Somatosensory amplification refers to the tendency to experience somatic and visceral sensations as unusually intense, noxious, and disturbing (Barsky et al., 1988). It involves with hypervigilance or heightened attentional focus on bodily sensation. Scholars report that the link between somatosensory amplification and somatic symptoms exerts medium to high overall strength (Köteles and Witthöft, 2017; Ishii, 2019).

The study on spirituality/religiosity has become considerable in this context, because its relationships among health variables exist. In the bio–psycho-spiritual model, potential pathways between spirituality and pain, which are revealed as spiritual beliefs, may correlate with psychosocial and physiological changes (Wachholtz et al., 2007). Many studies indicate that spirituality is linked to increased pain tolerance, muscle relaxation, positive mood, spiritual health, spiritual experiences, and decrease in anxiety (Rush et al., 2020). Moreover, research reveals that individuals who describe themselves as religious and spiritual report being physically and mentally healthier (Koenig and Cohen, 2002; Koenig, 2012). Such belief can also affect certain neuroendocrine and immune mechanisms, which positively impact a wide variety of health outcomes, such as susceptibility to cancer and recovery after surgery in the patients (Koenig and Cohen, 2002).

Spirituality can involve cognitive or emotional states like beliefs, motivations, a sense of gratitude or attachment to God, and other spiritual thoughts and feelings. The extant literature consistently illustrates that spiritual cognitions and emotions can be further divided into positive states (e.g., faith or trust in God, secure religious attachment, and religious gratitude) and negative states (e.g., appraisals that God is punitive or unfair). The positive cognitive and emotional aspects of spirituality and religion consistently act as a buffer against anxiety (Rosmarin and Leidl, 2020). Moreover, most studies report a positive correlation between religious or spiritual involvement and increased psychological well-being, hope, optimism, purpose, and meaning to life (Koenig, 2018).

Spirituality is a complex and multidimensional issue and can be defined as an individual and open approach for searching for meaning and purpose in life (Büssing et al., 2014). Many people continue to profess their religious affiliation. However, westerners transitioned toward a less religious identity. Notably, this trend coincides with substantial increases in the prevalence and severity of mental disorders across western countries in general. Experiences described as religious, such as feeling the presence of God or a higher power, feeling guided by a Spiritual Force, being grateful for one's blessings, and praying in its various forms, frequently occur outside the context of religion. Such spiritual experiences are common even among individuals who do not profess religious beliefs or affiliations. Nowadays, most research on religion and mental health is published using spirituality terms instead of religiosity (Rosmarin and Koenig, 2020).

According to a national survey (Japanese Institute of Statistical Mathematics, 2008), 73% of Japanese individuals do not believe in religion. However, this result does not necessarily imply that the majority of the Japanese are non-religious. Instead, it may mean that the ancient faith of Shintoism and the newly introduced religion of Buddhism have been integrated (i.e., the syncretization of Shintoism and Buddhism or *Shin-Butsu Shugo* in Japanese) during the long history of religion (i.e., more than 2,000 years). Faith has eventually become deeply incorporated into the psyches of the Japanese, and no longer recognized as religions (Nakao and Ohara, 2014). Many young Japanese believe in *something religious*, such as spirits and *the other world or heaven*. Commonly known as atheists, the Japanese cherish sensibility toward religious and spiritual aspects in the broader meaning of these words. A considerable segment of the Japanese population believes in invisible powers despite the lack of belief in any religion (Nishi, 2009; Nakayama, 2019). Meanwhile, Indonesia has five major religions, namely, Islam, Protestantism, Catholicism, Hinduism, and Buddhism. The majority of surveyed Indonesian residents (96%) reported a connection between their belief in God and the preservation of positive values (Tamir et al., 2020).

Both cultures may differ in terms of spiritual beliefs but have some resemblance. The previous study presents the

Japanese and Indonesian cultures as adopting the interdependent model of self-construal, which consists of connectedness and relationships with others frequently observed in non-western cultures (Singelis, 1994; Park and Kitayama, 2014). People with interdependent self-construal are likely to rely on social evaluations in developing and maintaining positive self-identities (Markus and Kitayama, 1991; Park and Kitayama, 2014). When communicating the cultural norms for the expression of emotions, Asians also tend to emphasize somatic symptoms instead of emotional states (Kleinman, 1986; Choi et al., 2016; Devany and Poerwandari, 2020). Additionally, few cross-cultural studies investigated the differences in the non-western context. The current study assesses the differences between Japan and Indonesia in terms of somatic symptoms and their relationship with anxiety, somatosensory amplification, and spirituality to fill this research gap. Research also explores the psychological and spiritual factors that correlate with somatic symptoms. Hence, the current study hypothesizes that the development of somatic symptoms is linked to anxiety, somatosensory amplification, and spirituality.

MATERIALS AND METHODS

Participants

This study was conducted in Japan and Indonesia in a non-clinical setting with the approval of the respective ethics committees. We recruited a convenience sample of 469 and 437 university students from Japan and Indonesia, respectively. The Japanese respondents consisted of 254 men (54.2%) and 215 women (45.8%) aged 18–30 years (M = 20.18 years, standard deviation [SD] = 1.41 years). Meanwhile, the Indonesian participants comprised 174 men (39.8%) and 263 women (60.2%) aged 17–27 years (M = 20.22 years, SD = 1.39 years). The data collection was accomplished before the restriction of the COVID-19 pandemic in both countries. This study followed a between-group cross-sectional design. Before the commencement of this study, the respondents provided written informed consent forms, which ensured the confidentiality of their answers and their right to withdraw from the study at any time.

Measurement

The participants completed several questionnaires, which lasted for approximately 20 minutes. This study used the Patient Health Questionnaire Somatic Symptom Severity Scale (PHQ-15; Kroenke et al., 2002). It consists of 15 items that assess the prevalence of the most common body symptoms. The items were rated using a three-point Likert-type scale (1 = not bothered at all, 2 = slightly bothered, and 3 = extremely bothered). Cronbach's α values were 0.844 and 0.830 for the Japanese and Indonesian versions, respectively.

The study adopted the Somatic Symptom Disorder-B Criteria Scale (SSD-12; Toussaint et al., 2015) to measure health concerns. The scale is composed of 12 items that comprise three domains or sub-criteria, namely, cognitive, affective, and behavioral, with four items each. The items were rated using a five-point Likert-type scale (0 = never; 1 = rarely; 2 = sometimes; 3 = often; 4 = very often). Cronbach's α values were 0.872 and 0.898 for the Japanese and Indonesian scales, respectively.

The State-Trait Anxiety Inventory was used to measure the participants' state and trait anxiety levels (STAI; Spielberger et al., 1970; Shimizu and Imae, 1981; Ginting et al., 2015). The scale comprised 40 items, which were rated using a four-point Likert-type scale (1 = not at all; 4 = very much so). For the Japanese scale, Cronbach's α values were 0.893 and 0.852 for state anxiety (20 items) and trait anxiety (20 items), respectively. For the Indonesian scale, these values were 0.874 and 0.804 for state anxiety and trait anxiety, respectively.

To measure positive and negative affect, the brief-form of the Positive and Negative Affect Schedule (PANAS; Watson et al., 1988) was used. The scale uses 20 words to describe different feelings and emotions (10 for positive affect and 10 for negative affect). The items were rated using a five-point Likert-type scale (1 = very slightly/not at all; 2 = a little; 3 = moderately; 4 = quite a bit; 5 = extremely) to report the extent to which they experienced each feeling and emotion in the past few weeks. For the Japanese version, Cronbach's α values were 0.877 and 0.869 for positive and negative affect, respectively. For the Indonesian version, these values were 0.862 and 0.865 for positive and negative affect, respectively.

Sensitivity to normal somatic and visceral sensations, somatosensory amplification, or bodily symptom sensitivity was assessed using the Somatosensory Amplification Scale (SAS; Barsky et al., 1988; Nakao et al., 2001), which consists of 10 self-rated statements. Items are rated using a five-point Likert-type scale (1 = not all true; 5 = extremely true). Cronbach's α values for this scale were 0.751 and 0.815 for the Japanese and Indonesian versions, respectively.

This study used the System of Belief Inventory (SBI) to assess the religious and spiritual beliefs of the participants (Holland et al., 1998). This scale is a shortened version of the SBI-54. It evaluates religious and spiritual beliefs as a potential mediator in coping with a life-threatening illness and the measurement of quality of life. It consists of 15 items rated using a four-point Likert-type scale (0 = none of the time; 3 = all of the time for items number 2, 7, 13, and 15, and 0 = strongly disagree; 3 = strongly agree for the remaining items). Cronbach's α values were 0.889 and 0.917 for the Japanese and Indonesian versions, respectively.

Two additional items pertaining to spirituality examine the beliefs of the participants in spiritual/religious treatment and belief in fate/destiny. Each item was considered independently to analyze the differences between the two cultures. The items were rated using a five-point Likert-type scale (0 = not at all; 5 = strongly belief).

SPSS version 27 (IBM Corporation) was used for statistical analyses. An Independent-sample t-test was performed to compare the means between variables. To measure the relationship between all variables, HAD version 17 was used for structural equation modeling (SEM) (Shimizu, 2016). The significance level of mean comparison and correlation analyses was set at $p < 0.05$. Cohen's d was used to estimate the effect size to indicate the standardized difference between the two means. The result of Cohen's d between 0 to 0.3 means a small effect or negligible differences.

RESULTS

Differences and Associations Among Affective State, Subjective Body Perception, and Spiritual Beliefs With Regard to Somatic Symptoms

A comparison of means between the Japanese and Indonesian participants revealed significant differences in somatic symptoms and affective states (i.e., health concerns, positive affect, negative affect, and state anxiety; $p < 0.01$; **Table 1**). The Indonesian respondents exhibited a higher mean than the Japanese. No significant differences were observed in trait anxiety between the two cultures. Additionally, the difference in somatosensory amplification was negligible, revealing a slight difference (Cohen's $d = 0.231$). Meanwhile, the Japanese and Indonesian respondents displayed significant differences in spiritual beliefs. The Indonesian respondents indicated a higher mean than the Japanese participants in belief in the spiritual-religious treatment and fate/destiny ($p < 0.001$; **Table 1**).

In **Table 2**, Indonesian participants' responses to the PHQ-15 showed that women more frequently experienced somatic symptoms than men ($p < 0.01$, Cohen's $d = -0.304$). Additionally, somatosensory amplification in Indonesian women higher than Indonesian men ($p < 0.01$, Cohen's $d = -0.343$; **Table 2**). Both differences showed a small effect size. However, there were no significant differences in somatic symptoms and somatosensory amplification between Japanese men and women participants. Mean comparison analysis in Japanese participants found the positive affect in Japanese women higher than Japanese men, but also with small effect size ($p < 0.01$, Cohen's $d = -0.279$; **Table 2**).

Furthermore, somatic symptoms for both cultures were positively correlated with somatosensory amplification, health concerns, state anxiety, and trait anxiety (**Table 3**).

Model of Affective State, Subjective Body Perception, and Spiritual Beliefs With Somatic Symptoms

The structural equation modeling (SEM) analysis of the assumed path between somatic symptoms, affective state (i.e., health concerns, trait anxiety, and positive affect), somatosensory amplification, and spirituality exhibited a better fit (Japan: $\chi^2 = 25.596$, $df = 3$, $p = 0.000$, CFI = 0.910, RMSEA = 0.127; Indonesia: $\chi^2 = 12.239$, $df = 3$, $p = 0.007$, CFI = 0.967, RMSEA = 0.084) (**Figure 1**). Moreover, the multigroup model with regression coefficients of two groups was compared. The analysis showed a significant difference, $\chi^2_{diff} = 37.836$, $df = 6$, $p = 0.000$. Affective states (i.e., health concerns and trait anxiety) were correlated with somatic symptoms ($p < 0.01$). Somatosensory amplification was positively associated with health concerns ($p < 0.01$). Furthermore, trait anxiety was positively related to somatosensory amplification for both cultures ($p < 0.01$).

Meanwhile, in the Indonesian participants, spirituality did not directly link with somatic symptoms. Low levels of spirituality were moderated by high levels of trait anxiety in the association of somatic symptoms. Moreover, high levels of positive affect moderated high levels of spiritual belief to low levels of somatic symptoms only among the Indonesian participants ($p < 0.05$). Among the Japanese participants, no association was observed between spirituality and trait anxiety. Nevertheless, both cultures displayed a positive association between spiritual belief and positive affect (Japan: $p < 0.05$; Indonesia: $p < 0.01$).

DISCUSSION

This study reports differences in health concerns, positive and negative affect, state anxiety, and spiritual belief between

TABLE 1 | Descriptive statistics of gender, somatic symptom, affective state, subjective body perception, and spiritual belief in Japanese and Indonesian participants.

	Japan (n = 469)		Indonesia (n = 437)		t-statistics		Cohen's d
	Mean	SD	Mean	SD		P	
Gender (% women)	45.8		60.2		$\chi2 = 18.66$	<0.001***	Phi 0.144
PHQ > PHQ-15	19.401	4.928	22.055	5.037	−2.654	<0.001***	−0.533
SSD > SSD-12	20.273	7.018	27.247	8.998	−6.974	<0.001***	−0.868
PANAS PA	27.22	8.419	35.913	6.785	−8.693	<0.001***	−1.133
PANAS NA	25.156	8.377	37.572	6.594	−12.416	<0.001***	−1.64
STAI Y1	44.78	10.672	46.391	9.546	−1.611	0.005**	−0.159
STAI Y2	48.923	9.474	48.918	8.125	0.006	0.886	0.001
SAS	31.631	6.715	30	7.436	1.631	<0.001***	0.231
SBI	6.919	7.185	32.874	9.07	−25.955	<0.001***	−3.185
Survey							
1. Belief in spiritual-religious treatment	1.729	0.87	3.714	1.147	−1.985	<0.001***	−1.959
2. Belief in fate/destiny	2.906	1.211	3.705	1.216	−0.799	<0.001***	−0.658

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.
Phi φ = 0.1 and Cohen's d between 0 to 0.3 are considered to be small effect.
PHQ-15, Patient Health Questionnaire-15; SSD-12, Somatic Symptom Disorder-Criteria B; PANAS PA, Positive Affect; PANAS NA, Negative Affect; STAI Y1, State Anxiety; STAI Y2, Trait Anxiety; SAS, Somatosensory Amplification Scale; SBI, Systems of Belief Inventory.

TABLE 2 | Comparison between men and women in the Japanese and Indonesian participants.

	Men		Women		*t*-statistics		Cohen's *d*
	Mean	**SD**	**Mean**	**SD**		***P***	
Japan	*n* = 254		*n* = 215				
PHQ > PHQ-15	19.642	5.122	19.116	4.683	1.151	0.250	0.107
SSD > SSD-12	19.984	6.893	20.614	7.164	−0.968	0.333	−0.09
PANAS PA	26.154	8.663	28.479	7.957	−3.006	0.003**	−0.279
PANAS NA	24.677	8.618	25.721	8.067	−1.346	0.179	−0.125
STAI Y1	44.516	10.594	45.093	10.78	−0.583	0.559	−0.054
STAI Y2	49.173	9.679	48.628	9.24	0.621	0.535	0.058
SAS	31.079	6.96	32.284	6.369	1.942	0.053	−0.18
SBI	6.327	6.772	7.619	7.602	−1.946	0.053	−0.18
Indonesia	*n* = 174		*n* = 263				
PHQ	21.144	5.058	22.658	4.941	−3.106	0.002**	−0.304
SSD	27.167	8.915	27.3	9.07	−0.152	0.879	−0.015
PANAS PA	36.477	7.454	35.54	6.292	1.415	0.158	0.138
PANAS NA	37.098	7.07	37.886	6.254	−1.224	0.222	−0.12
STAI Y1	45.787	9.92	46.791	9.288	−1.076	0.283	−0.105
STAI Y2	49.351	8.173	48.631	8.096	0.906	0.365	0.089
SAS	28.483	7.413	31.004	7.292	−3.514	0.001**	−0.343
SBI	31.971	10.014	33.471	8.354	−1.696	0.091	−0.166

*$p < 0.05$, **$p < 0.01$, ***$p < 0.001$.
PHQ-15, Patient Health Questionnaire-15; SSD-12, Somatic Symptom Disorder-Criteria B; PANAS PA, Positive Affect; PANAS NA, Negative Affect; STAI Y1, State Anxiety; STAI Y2, Trait Anxiety; SAS, Somatosensory Amplification Scale; SBI, Systems of Belief Inventory.

Japanese and Indonesian participants. But, the difference in the somatosensory amplification was inconsiderable. In this study, the differences between men and women in both cultures were also inconsiderable. However, the study presented an association among psychological and spiritual factors in the development of somatic symptoms between the Japanese and Indonesian respondents.

The findings clearly indicated that somatic symptoms emerge from affective state factors. The results were consistent with the relevant works of literature. For example, Maulina (2017) found that trait anxiety (negative emotion level) was consistently higher in individuals with clinically high levels of health anxiety than those without. Moreover, trait anxiety and health anxiety or health concerns strongly influenced somatic symptoms (Pennebaker, 2000; Maulina, 2017). As such, individuals with trait anxiety hold pessimistic views about the world (Pennebaker, 2000). High levels of trait anxiety were linked to high levels of negative affect.

Moreover, Köteles and Simor (2014) found that high levels of health concerns or health anxiety are correlated with high levels of somatosensory amplification. Additionally, high levels of trait anxiety moderate high levels of somatosensory amplification or high levels of bodily symptom sensitivity with somatic symptoms. Thus, individuals with trait anxiety are hypervigilant about their bodies and hold a lower threshold for noticing and reporting subtle physical perceptions (Pennebaker, 2000). They are also likely to worry about the implications of their perceived symptoms.

The bio-psycho-spiritual model reveals the potential pathways between spirituality and pain, because spiritual beliefs may correlate with psychosocial and physiological changes (Wachholtz et al., 2007). This study demonstrated that affective states moderate somatosensory amplification and spiritual belief related to somatic symptoms. The positive cognitive and emotional aspects of spirituality and religion consistently create a buffer against anxiety (Rosmarin and Leidl, 2020). Additionally, among the highest-quality studies that examined the association of spirituality to well-being, happiness, or life, 82% reported positive associations (Koenig, 2018). Spirituality denotes positive emotions, such as love, hope, joy, forgiveness, compassion, trust, gratitude, and awe (Vaillant, 2008, 2013). The effect of positive emotions on the autonomic nervous system has much in common with the relaxation response to meditation (Benson and Stark, 1997). In contrast to the fight-or-flight response induced by negative emotions, which activate the sympathetic nervous system, positive emotion activates the parasympathetic nervous system. Similar to meditation, positive emotions, such as joy, compassion, attachment, trust, and forgiveness, may decrease metabolism, blood pressure, heart rate, respiratory rate, and blood cortisol levels. In the current study, positive emotions decreased somatic symptoms. Spirituality may play an essential part in responding and coping with illness in the clinical setting. A previous study found higher spirituality was significantly associated with lower severity of fatigue and depression in cancer patients (Miller et al., 2022). Meanwhile, in individuals with coronary heart disease (CHD), higher level of spirituality was associated with lower levels of depressive symptoms, less anxiety, and less anger (Ginting et al., 2015). As the need for a new medical model, an integration of biopsychosocial and spiritual suggested by Dyer raised all of the elements. The response variability in spirituality also can be seen personally and are beneficial (Dyer, 2011).

Furthermore, this study found firmer spirituality beliefs among the Indonesian participants than the Japanese participants. In the additional survey, the Indonesians, specifically the university students, believe in fate/destiny and spiritual-religious treatment headed by a religious leader. The beliefs explained that only Indonesia exhibited the role of spirituality in the somatic symptoms model, although the correlation analyses revealed significant positive associations between spirituality and positive affect for both cultures. The beliefs of spirituality in Japan may be unique. The Japanese believe in invisible powers and feel that they can rely on them. Thus, they do not necessarily believe in religion (Nishi, 2009; Nakayama, 2019). In western countries, people tend to become spiritual believers but not religious after denying their faith and taking a stance toward its religious traditions and systems. In Japan, however, spiritual belief is not based on any positive or deliberate rejection of religious establishment or its systems, especially among young people. This group pours into Japanese temples and shrines in search of the so-called *power spots* or *sacred places* to heal or revive visitors, which may influence the human body and mind by producing a form of spiritual energy (Kotera, 2011; Nakayama, 2019).

TABLE 3 | Correlations among related variables for each cultural group.

	1	2	3	4	5	6	7	8
(1). PHQ > PHQ-15	–	0.337**	−0.063	0.010	0.272**	0.331**	0.318**	0.053
(2). SSD > SSD-12	0.391**	–	0.079	0.153**	0.284**	0.342**	0.215**	−0.033
(3). PANAS PA	−0.094*	0.021	–	0.476**	−0.219**	−0.066	0.193**	0.135**
(4). PANAS NA	0.299**	0.237**	0.421**	–	0.027	0.173**	0.295**	0.186**
(5). STAI Y1	0.317**	0.214**	−0.203**	0.430**	–	0.734**	0.009	−0.135**
(6). STAI Y2	0.381**	0.262**	−0.214**	0.466**	0.637**	–	0.208**	−0.142**
(7). SAS	0.188**	0.443**	0.120*	0.246**	0.178**	0.253**	–	0.088
(8). SBI	0.107*	0.089	0.110*	0.079	0.062	0.039	0.001	–

*$p < 0.05$, **$p < 0.01$.

Correlations for Japanese participants are shown below the diagonal (n = 469), and correlations for Indonesian participants (n = 437) are shown above the diagonal. PHQ-15, Patient Health Questionnaire-15; SSD-12, Somatic Symptom Disorder-Criteria B; PANAS PA, Positive Affect; PANAS NA, Negative Affect; STAI Y1, State Anxiety; STAI Y2, Trait Anxiety; SAS, Somatosensory Amplification Scale; SBI, Systems of Belief Inventory.

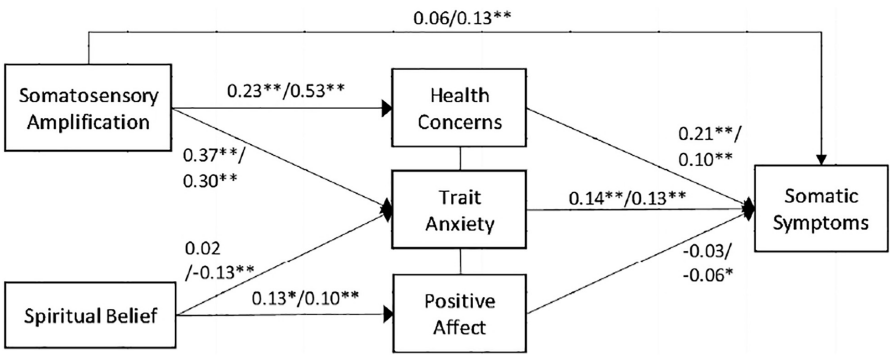

FIGURE 1 | Model of affective state, subjective body perception, and spiritual belief with somatic symptoms. The Japanese participants are mentioned first followed by the Indonesian participants. *$p < 0.05$, **$p < 0.01$.

Japan and Indonesia have an interdependent model of self-construal, which is typical of Asian countries (Singelis, 1994; Park and Kitayama, 2014). This resemblance in culture demonstrates the importance of maintaining harmony in the community. The Japanese culture displays many characteristics, such as prioritizing group harmony over individual opinions, where Japanese people exhibit a strong sense of shame for "losing face." In addition to maintaining peace, Asians tend to somatize negative experiences more than westerners do (Choi et al., 2016). Specifically, Asians emphasize somatic symptoms instead of emotional states in their communication, which can be understood as their cultural norms for expressing emotions (Kleinman, 1986; Choi et al., 2016). In this study, the Indonesians displayed a higher mean of somatic symptoms and health concerns compared with that of the Japanese. As such, the Japanese are less interdependent than most Asian neighbors, including Indonesians (Country Comparison - Hofstede, 2001; Hofstede Insights, 2021). Indonesia has a lower preference for avoiding uncertainty compared with Japan, which is one of the most uncertainty-avoidant countries. The Japanese have learned to prepare for any uncertain situation and allocate much time and effort into feasibility studies and the examining risk factors. In contrast, Indonesia strongly prefers the separation of the internal self from the external self as practiced in Javanese culture, the largest ethnic group in Indonesia. When a person is upset, Indonesians customarily refrain from expressing negative emotions or anger. Thus, they tend to keep smiling and remain polite regardless of how angry they may be on the inside. Direct communication is frequently perceived as threatening and uncomfortable, which leads them to avoid confrontations. Thus, somatic symptoms tend to emerge due to significant distress or problem in functioning. Spirituality may also facilitate increased tolerance to uncertainty (Rosmarin and Koenig, 2020).

Additionally, as a developing country, community healthcare system in Indonesia is still growing. Alternatively, Japan operates one of the best healthcare systems in the world for various reasons, such as availability, effectiveness, and efficiency. In the past 50 years, Japan has achieved good demographic health at a reasonably low cost (Hamada and Lapalme-Remis, 2008; Hashimoto et al., 2011). This reason may lower the Japanese concerns for health issues.

LIMITATIONS

In this study, spirituality was limited in terms of its associations with other variables, such as social support and the COVID-19 pandemic context. Additionally, this study investigated two cultures only and was limited to the emerging and young adulthood periods. Therefore, further studies should explore

the somatic symptoms experienced by other cultures and their association with spirituality beliefs and consider the various developmental stages, e.g., middle adulthood. The participants were recruited from university-based samples of healthy individuals. A clinical setting study with intervention programs may benefit the healthcare system, particularly in patient-doctor interaction. Further cross-cultural research and longitudinal study are required to confirm the current findings and improve their generalizability. Another related issue is the accuracy of self-reported measures; hence, future studies may benefit from incorporating objective physiological method, psychological variables, and spirituality in the experimental setting.

CONCLUSION

Comparative studies on understanding somatic symptoms and their relationship with the psycho-spiritual variable in Asian countries are scarce. Despite these limitations, the current study elucidates the association of affective state, subjective body perception, and spirituality with the prevalence of somatic symptoms. Spirituality contributed to the psychological process of somatic symptoms in one culture, wherein positive emotions may moderate spiritual belief to decrease somatic symptoms. In healthy individuals from the two Asian countries, namely, Japan and Indonesia, health concerns and trait anxiety, which were linked to somatosensory amplification, contributed to somatic symptoms.

DATA AVAILABILITY STATEMENT

The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by the Ethics Committee of Nagoya University. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

VM and HO designed the study. VM conducted the research, analyzed the data, and drafted the manuscript. MY collected the data. HO provided the critical feedback. All authors read and approved the final version of the manuscript.

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CONCEPTUAL ANALYSIS
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Praying for a Miracle: Negative or Positive Impacts on Health Care?

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The belief in miracle, as a modality of spiritual/religious coping (SRC) strategy in the face of stress and psychic suffering, has been discussed in psychological literature with regard to its positive or negative role on the health and well-being of patients and family members. In contemporary times, where pseudo-conflicts between religion and science should have been long overcome, there is still some tendency of interpreting belief in miracle – as the possibility of a cure granted by divine intervention, modifying the normal course of events in a bleak medical diagnosis – as having unhealthy impacts in the care and treatment of health. This position seeks to find a base in the three characteristics of hoping in a miracle, frequently pointed out by psychological literature: (a) it would imply a negation of reality instead of its confrontation; (b) it would be a coping strategy focused on emotion instead of the problem; (c) it would imply seeking to modify the supposed desire of God by extra-natural facts. In this study, we shall critically discuss this position and the dangers of its crystallization by the use of SRC scales in which the act of praying for a miracle is previously classified as a negative strategy. We revisit some tendencies in psychological literature about the subject, taking into consideration the various facets of miracle, sociocultural facts, elements of idiographic nature, and their profound outcomes in the lives of people especially in health contexts. We illustrate the dangers of a hasty generalization of the results of nomothetic studies about the role of belief in miracle with two examples of research in the Brazilian context: one carried out with pregnant women with fetal malformation and the other with family members caring for children and adolescents with cancer under chemotherapeutic treatment. In both studies, the results do not confirm the predominance of the negative aspects associated with the act of praying for a miracle, which we discuss and analyze in light of the phenomenological perspective. In this perspective, "pray for a miracle", as experienced by patients and caregivers, can be recognized as an act of openness to life (instead of isolation in a bleak perspective), bolstering hope, and the resignification of reality in the psyche.

Keywords: miracle, coping, spiritual/religious coping, prayer, qualitative research, quantitative research, phenomenological approach

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INTRODUCTION

The intersection between religion and science was established in a conflicted way in the West in the Renaissance period. However, since the 1990s, there has been a burgeoning of scientific research on the theme of religiosity and spirituality (Koening, 2012) that has enhanced a rapprochement between the health sciences and these subjects. Such approximation becomes so striking in crucial circumstances of human life such as birth, chronic illness, suffering, and death (Sulmasy, 2013). In such a new phase of the interaction between religion and science, especially the health sciences, there is not necessarily a hierarchical relationship of one over the other. Religion and spirituality, in clinical practice, are the patients' instruments of coping in diverse ways with critical situations such as the diagnoses of chronic illnesses, a majority of them being dismal prognoses, and harrowing treatments that lead to permanent sequela or even death, and as such constitute the so-called spiritual/religious coping (SRC; Pargament and Park, 1997).

On developing the concept of SRC, defined as a process whereby people, through faith, spirituality, religiosity, or religion, seek to understand and cope with significant circumstantial demands in their lives, Pargament and his collaborators (Pargament and Hahn, 1986; Pargament, 1990; Pargament et al., 1990) have made substantial contributions to the research about the role of religiosity in healthcare. One of the results of their research is the creation of a scale that seeks to quantify SRC (Pargament et al., 2000), thereby enhancing wide-ranged research of nomothetic nature in different health contexts. This scale was later translated and adapted to various languages and countries including Brazil (Panzini and Bandeira, 2005), where a significant expansion of studies in health that employ this instrument has been observed in recent years (Panzini and Bandeira, 2007; Corrêa et al., 2016; Esperandio and August, 2017; Foch et al., 2017; Huang and Torres, 2018).

Both the original definition of the concept of SRC and the elaboration (and the respective translations and adaptations) of the scale that sets out to measure it has two concerns: "the need to cope with the event itself and the need to cope with one's feeling and behavior in relation to that event" (Pargament and Hahn, 1986, p. 196). Furthermore, considering the manner that SRC strategies are manifest, they can be classified as active or passive, focused on the problem or emotion, bearing in mind that since the original version of the scale, such strategies were also classified as positive SRC (PSRC) – when they lead to a real facing of the problem, or personal and spiritual growth, promoting satisfaction with life, even in times of crises – or as negative SRC (NSRC) – when they tend to impair physical or mental health and lead to the increase of depression, anxiety, suffering, desperation, or increase of guilt in the face of stress factor (Pargament et al., 2000).

The prospect of a miracle or the act of praying for a miracle was one of the strategies of SRC included in the scale in question through the affirmation "I prayed for a miracle." In fact, hope in a miracle is much more frequent in health contexts (Green, 2015; Dossey, 2018; Bibler et al., 2020) and nurtured by patients, family, and sometimes by the professionals who care for them. This manner of confronting illness may pose a veritable challenge to health professionals and has been frequently described as having a negative feature that portrays a kind of shying away from reality, creating fantastic thoughts (Vasconcelos and Petean, 2009; Borges and Petean, 2018), or implies a delegating of the grappling with moments of crises outside of oneself (to the Divine, Sacred, or God) to prayer, which, according to some authors, is anchored on the wish to modify the will of God in favor of the will of the patient (Panzini, 2004). Such a perspective is based on the extra-natural concept of a miracle that infringes natural laws (Aurélio., 2010).

As we shall see later in more details in this study, in the complete version of the North American SRC scale (called RCOPE), elaborated by Pargament et al. (2000), later on translated and adapted to Brazil by Panzini and Bandeira (2005), the act of praying for a miracle was classified as a negative feature, that is to say, NSRC. However, belief in miracles still receives little attention in health research, and qualitative studies, like those carried out by Shinall et al. (2018), which tend to see not only negative aspects but also positive ones, especially in countries with a high religious population, like Brazil, where 92% of the population declare having some religion (Brasil, 2021) and with a high dynamicity of movement between diverse religions (Mota et al., 2012).

It naturally follows that the positive/negative dichotomy surrounding the act of praying for a miracle, as a modality of SRC, is full of relevant implications for clinical practice, especially in specific cultural contexts different from the North American social reality where the scale in question was originally conceived. Therefore, the aim of this study is to discuss the role of belief in a miracle as one of the SRC strategies and to problematize the dichotomy adopted by quantitative research (that employs the scale in question) carried out in Brazil. Besides exploring the various aspects of a miracle, based on the available literature on the subject, the problematization is underpinned by a phenomenological perspective and qualifies intentionality in the act of praying for a miracle. Thereby, we intend to encourage a more effective dialog between theology and psychology as well as retrieving the value of a culturally contextualized research of idiographic nature.

To this end, this study is arranged into five topics. After this short introduction, we present the concept of a miracle in the ordinary perspective (of common dictionaries) and the philosophical, phenomenological, and theological perspectives; its different psychological meanings are also discussed. This is followed by a detailed analysis of the multiple aspects that characterize the act of praying for a miracle which may determine or not its classification as negative and/or positive SRC, especially in health settings. Thenceforth, by way of illustrating the problematization presented, we bring up two examples of studies carried out in Brazil – that employed the RCOPE scale of Pargament et al. (2000), translated by Panzini and Bandeira (2005) – and their respective findings. Finally, a

discussion that integrates the topics treated in the study from a phenomenological perspective follows.

THE CONCEPT OF A MIRACLE FROM DIFFERENT PERSPECTIVES

According to the Oxford English Dictionary (2010), a miracle can be understood both as an uncommon act or incident inexplicable by natural laws, and also as a formidable and stupendous event. This ordinary meaning of miracle tends to be commonly employed in the contexts of the health sciences. For example, when a patient hopes for a cure of a terminal disease, and the medical team evaluates this as a total lack of technical foundation (Pinto and Falcão, 2014), the belief in miracle is considered to be something very negative.

But in the philosophical sense, as Swiezynski (2012) explains, a miracle can be understood as an extraordinary event for disagreeing with the prevailing knowledge of the world and its regularities, for example, when someone survives a plane crash thousands of kilometers high or survives an extremely advanced state of cancer. This way of defining a miracle, different from the other, offers a space for mystery, something that eludes the technical knowledge acquired by humans. In this sense, to believe in the miracle of cure would not be seen necessarily as negative, but as a kind of openness to possibilities yet unknown and explained by the present state of medical science.

In the religious sense, miracle refers not only to an extraordinary event but also, and essentially, to the fact of resulting from divine providence or some force that transcends matter or mere human action (Swiezynski, 2012). In this case, it could be seen by the medical team as something positive or negative depending not only on the way this belief is handled by the patient but also and necessarily: (a) on the openness of the health professionals to alternative ways of explaining and managing the processes of health and illness different from the technical knowledge that has been made available by medical science; (b) on their favorable or unfavorable attitudes to the dimension of religiosity and spirituality and its role in people's lives.

As the phenomenologist Tillich (1967) pointed out, even though the usual definition of a miracle is that of a phenomenon that contradicts the laws of nature, the original sense of the term refers to that which provokes amazement but does not, for that alone, contradict reality. In other words, a miracle is an incident that points to the mystery of being and is an event that is seen as a signal event in an ecstatic experience. Therefore, a miracle would be a revelation of the Divine and not something supernatural (magic). As such, it does not contradict reason, and the sciences, psychology, and history can assist theology in the process of the revelation of a miracle.

In other words, Tillich (1967) criticizes the use of the word miracle to designate something irrational and posits that "Miracles cannot be interpreted in terms of a supranatural interference in natural processes. If such an interpretation were true, the manifestation of the ground of being would destroy the structure of being" (p. 129). According to him, a miracle is part of a structure grounded on reality: "A genuine miracle is first of all an event which is astonishing, unusual, shaking, without contradicting the rational structure of reality (.) One can say that ecstasy is the miracle of the mind and that miracle is the ecstasy of reality" (Tillich, 1967, p. 117). Thus, ecstasy presents both a psychological and transcendent character and reveals a relation between mystery (miracle from an objective point of view) and being: "Ecstasy is the form in which that which concerns us unconditionally manifests itself within the whole of our psychological conditions" (Tillich, 1967, p. 113).

Also, for Saint Thomas Aquinas (1265–1273), a miracle does not necessarily mean something supernatural or something without any contextualization in the real world:

"The word miracle is derived from admiration, which arises when an effect is manifest, whereas its cause is hidden; as when a man sees an eclipse without knowing its cause, as the Philosopher says in the beginning of his Metaphysics. Now the cause of a manifest effect may be known to one, but unknown to others. Wherefore a thing is wonderful to one man, and not at all to others: as an eclipse is to a rustic, but not to an astronomer. Now a miracle is so called as being full of wonder; as having a cause absolutely hidden from all: and this cause is God. Wherefore those things which God does outside those causes which we know, are called miracles." (Saint Thomas Aquinas, 1265–1273, p. 692).

It can be observed that from the perspectives presented hitherto, only the first definition, taken from a common dictionary, sees a miracle as a necessarily supernatural phenomenon and favors its interpretation as something that has negative behavioral results in health contexts. In this sense, when used as SRC, the hope in a miracle would represent a negation of reality or a blind and passive hope of cure which often leads to a rejection of treatment or prescribed medication as can be verified in different reports of health professionals about the role of religiosity on physical and mental health (Pinto and Falcão, 2014; Freitas, 2020). However, understood in the philosophical or Christian-theological sense, a miracle would not go against natural laws. Instead, it would be an event yet to be explained by the level of scientific knowledge so far attained by humans or by a particular sphere of knowledge. In this frame of mind, the act of praying for a miracle would not necessarily mean a negation of reality, but rather, recognition of the limits of knowledge so far attained by medicine, for example. This view paves the way for the belief in miracles to be seen as also having positive results for health as can be seen in many other Brazilian and international studies (Borges et al., 2015; Carlsson et al., 2017; Borges and Petean, 2018).

On the other hand, still from the conceptual point of view, it is relevant to reflect on the terms used in the original RCOPE scale (Pargament et al., 2000) and its posterior translation for Brazil (Panzini and Bandeira, 2005). This specific modality of SRC is evaluated in this scale through a positive or negative response for the item "I prayed for a miracle." We should consider the fact that responding affirmatively to this question, the respondent does not necessarily desire cure exclusively. After all, the act of praying is more than supplication and can also be understood as a way

of connecting and communicating with God, as Espirito Santo (2016, p. 576) points out:

"Prayer is an intense struggle of a being in the effort to reconnect with the fount of life and meaning which is God. In the innermost realm of being, words lose their meaning and value, this is the moment when contemplation, as metalanguage, becomes a means of communication between human being and God."

The act of praying for a miracle may present various and complex aspects when observed from a qualitative phenomenological point of view because, in this perspective, what is more relevant is the lived phenomenon grasped in the act (Amatuzzi, 2003). In other words, in the specific case that we address here, what is most important is how the desire or hope in miracle really impacts the lives of patients or their family members, which includes their psyche (emotions and cognition), their behavior, relationship with the world, and all that it entails (including the health professional that cares for them, medication, treatment, and so on). That is to say, what is decisive in evaluating the positive or negative impact on patients' health would not be the simple fact of their affirming that they "prayed for a miracle" *per se*, but its impact on the life of the patient with grave illness. This would imply discarding conceptions previously undermined by dichotomous interpretations.

Having presented this short conceptual and terminological consideration, we address the various psychological aspects of a miracle and its multiple facets, which should be considered in the evaluation of their positive or negative impact on people's health.

BELIEF IN MIRACLES UNDER MULTIPLE ASPECTS AND THEIR DIFFERENT FACETS

One of the psychological aspects through which belief can be analyzed, from a cognitive point of view, relates to the locus of control, through the attribution of causality, by which people perceive that life events are internally controlled – e.g., by itself - or externally – e.g., by other agents. Originally, the concept of locus of control was developed by Rotter (1990) to describe how the individual perceives that he or she has or does not have control of his or her life. According to him:

"Internal versus external control refers to the degree to which persons expect that a reinforcement or an outcome of their behavior is contingent on their own behavior or personal characteristics versus the degree to which persons expect that the reinforcement or outcome is a function of chance, luck, or fate, is under the control of powerful others, or is simply unpredictable" (Rotter, 1990, p. 489).

Hayward et al. (2016, p. 888) affirmed that "Religious beliefs may have a number of important implications for one's health locus of control, and these implications may vary depending upon the specific nature of those beliefs." Therefore, when religious belief fosters an active stance of care for health in the individual (control mediated by God), the results tend to be beneficial. However, when the belief delegates the function of caring for the individual to the Divine, the results may be harmful. From this point of view, the hope in a miracle, much more frequent in critical situations (Hayward et al., 2016; Borges and Petean, 2018; Bibler et al., 2020), is considered an external and passive way of religious control which would bring harm to the health of the individual. On the other hand, the above authors emphasize that, in end-of-life situations or cases of incurable diseases, delegating destiny to God could often mean acceptance of the outcome and avoidance of the prolongation of invasive and unsuccessful treatment. In the same way, Pargament et al. (1988) affirmed that passive ways of coping are appropriate in situations beyond the control of the individual such as death, terminal illnesses, and accidents, granted that he or she finds protection from anxiety and a haven in religiosity and spirituality, which are important elements for coping with problems whose solutions are beyond his or her reach and that of the health professionals. Such acts as praying for a miracle and leaving the solution "in the hands of God" often emerge in these situations.

However, it is worth noting here that even from the religious point of view, hope in a miracle or the prospect of a miracle does not necessarily imply a merely passive attitude whereby the locus of control is necessarily attributed only to external agents. For example, in the Judeo-Christian theological understanding of miracles, the active participation of the patient in the therapeutic process is presumed. Such participation stems from the hope and optimism that impels the patient to collaborate with the therapist and comply with his or her instructions, not merely waiting passively for a miracle to happen as if it were magic. The paradigmatic case of the cure of Naaman the leper in the Old Testament is a good example here. Elijah the prophet instructs the leper to go to River Jordan and bathe seven times there. The leper, though reluctant at first, heeded the instruction and the miracle occurred (Green, 1986b, 1–14). We find another paradigmatic passage in the New Testament where ten lepers seek Jesus for a cure. He gives them an instruction which they carried out. Upon heeding the instruction, the miracle of cure happened (Green, 1986a, 11–19).

Another psychological aspect that needs to be evaluated when we situationally analyze the role of the belief in miracle in health settings is with regard to its concrete effect on the behavior of the individual and its respective impact on the treatment and the relationship with health professionals. Some authors, specifically concerned with such aspects, discovered patterns and developed classifications for the behaviors of patients and caretakers based on how the latter is affected by their respective beliefs in a miracle. For example, Shinall et al. (2018), based on their studies with adult patients under palliative care, differentiated belief in miracle into four patterns: (a) harmless: when the patient hopes for a plausible positive but improbable result for a cure. This does not generally spark off conflicts with health professionals; (b) Shattered hopes: when faith is paralyzed due to an unfavorable clinical evolution. Generally, this does not generate conflicts with doctors but leads to an important existential pain and impairs the patient's quality of life; (c) Integrated: grounded on religious dogmas, and may not be in compliance with health professionals, and spark off conflicts in the doctor-patient relationship; (d) Strategic: religion imposes itself on the situation

and obstructs wider consultations about care decisions and constitute a negation of reality.

Bibler et al. (2020) recently described a new classification of belief in miracles for caregivers of gravely ill children in the following way: (1) integrated: patients see the clinical state from a religious standpoint and bring religious objects, and may spark off a confrontation with science; (2) Procurators: the child's caregivers do not depend totally on the religious community and the miracle may assume other meanings beside cure, for example, the well-being of the child; (3) Adaptable: they manifest the feature of having faith but adapt to religions, do not like to talk about miracles, generally, and see the care given to patients with distrust.

Even though the classifications presented above are based on the concern of identifying the beneficial or harmful impacts of the belief in miracles on the patients' health and the respective treatment, they are not necessarily dichotomic. They are inspired by the concept of coping as a strategy of psychological adaptation; they consider the specific role of belief in miracles and the respective impacts on the medical team and on the patients/caregivers; they take opposite outcomes into account or conciliation and possible psychical consequences of the hope in a miracle that may be harmful to the individual – for example, the cases of shattered hopes, when the miracle does not occur, which impairs the quality of life of the patient; besides the strategic and adaptable cases, where the belief in a miracle leads to conflicts with the medical team since the patient withdraws the locus of control about the illness from the hands of the medical team and transfers it to religion.

Another psychological aspect adopted by the cognitive sciences to evaluate the individual's psychological adaptation has to do with the type of coping strategy used in times of stress or crises. Folkaman (1984) classified coping strategies in modalities, defined by behaviors or mindset used to cope with stressful events; they are focused on emotion or the problem and maybe concomitantly employed, one supporting the other in specific stressful situations. A coping that is focused on the problem aims at a resignification or a direct action on the event that triggered the stress and tries to modify it either by employing internal (redefinition of the stressful element) or external (negotiate, seek support) actions. But coping focused on emotion is an effort to regulate the emotional state associated with the stress. The efforts are directed to the somatic or psychic level to modify the emotional state of the individual in the attempt to reduce the unpleasant physical sensation of stress. The act of praying for a miracle can also be considered from these two perspectives.

In a certain way, some psychological theories created the stereotype of religion as a coping strategy focused on emotion, representing a defense mechanism (Pargament et al., 2005), thereby concluding that such kind of confrontation may lead to negative psychological adaptations since the individual does not act on the problem by seeking solutions or alternatives of modifying the lived reality (Paiva, 1998). Seen from this stereotyped angle, the desire for a miracle will be easily interpreted as a negation of reality for not focusing concretely on the problem but rather, on pure emotion, as a way of controlling the suffering sparked by the situation of crisis.

It is pertinent here to problematize this dichotomy. After all, the attitude of coping with reality by focusing on emotion does not necessarily mean a negation. Instead, it could mean an attitude of confidence in the future and a hopeful stance – and even resilience, for example, in the face of illnesses of high lethality and grave pain. In various terminal clinical situations, like cancer and neurodegenerative illnesses, there is no solution or way out of the problem through expertise or available medical technology, thereby making it necessary to have recourse to emotion, seeking resilience and acceptance. In these cases, the openness to the unknown, to the existential mystery is oftentimes the best way out since there is no solution within the reach of the patient or the medical team. Even when it appears to be a sheer negation, the hope in a miracle can still fulfill the purpose of "gaining" some internal time to accept the reality of a bleak diagnosis or inevitable death as the studies of Kübler-Ross (1969) point out. From the emotional point of view, this necessity is justifiable and what frequently happens is that the health professional does not have the time or necessary skills to manage this interim between the first reaction of a (de)generative character and its posterior outcomes.

Another example that illustrates the relativity of the judgment of whether SRC strategy focused on emotion is positive or negative, and which also points to the necessity of considering the complex relations between the act of hoping for a miracle and psychological adaptation, is the result of a meta-analysis made by Ano and Vasconcelles (2005). On establishing relationships between the SRC and the psychological adaptation of the individual in the face of a stressful situation, the authors discovered that even when the miracle does not occur, and this is interpreted by the patient (or family member) as he or she being undeserving of such, or as God's punishment or abandonment, this does not necessarily lead to depressive and anxiety states. On the contrary, he or she can interpret the fact of the prayer for the miracle not being granted as an opportunity of re-signifying and transforming his or her life: "One explanation for this finding is that, although negative religious coping may be harmful, it does not necessarily prevent people from experiencing positive outcomes." (Ano and Vasconcelles, 2005, p. 474).

The various considerations made so far point to the necessity of adequately contextualizing the clinical situations that surround the belief or hope in a miracle. This natural complexity of the subject demands a cautious and critical evaluation of the initiatives of studies of nomothetic nature, based on scales that tend to group different SRC strategies as positive or negative – among whom is the hope in a miracle, from their previous identification of being: (a) passive or active, in the measure that the locus of control is situated within or outside of the individual; (b) focused on the problem or emotions. So much so that the creators of the RCOPE (Pargament et al., 2000, p. 521) recognize the complexity of the perspective of religion and spirituality in the health sciences: "We recognize, however, that any form of religious coping may serve more than one purpose. Thus, we did not expect to find five factors of religious coping that correspond to these five religious functions."

Specifically addressing the complexity of belief in miracle, Panzini (2004), also, on translating and validating the SRC scale,

described the item "I prayed for a miracle" as ambiguous and recognizes that this item contains both positive and negative aspects and as such not possible to be classified *a priori* in one polarity or the other. Even though no reasons were given for such, the item referred to was not even included in the shorter versions of the RCOPE scale (Pargament et al., 2011; Esperandio et al., 2018), one of them being elaborated/adapted by the same author. Such a version was considered more adequate for research by Vallada et al. (2013) in comparison to the original.

It can therefore be seen that the generalization of the positive-negative dichotomy developed around the belief in miracle is very superficial and does not necessarily favor an understanding of how the belief can be beneficial or harmful to the psychological adaptation of patients and caregivers. This is still true in the case of a country with a high religious population like Brazil.

EXAMPLE OF TWO STUDIES CARRIED OUT IN THE BRAZILIAN CONTEXT

Brazil has a population of approximately 214 million people (Brasil, 2021) and is one of the twelve most religious countries of the world and the second most religious country in Latin America according to a survey conducted by Win/Gallup International (2015). According to this same survey, 79% of people in Brazil consider themselves religious and 81% consider that religiosity has a positive role in their country. Despite the significant predominance of the Christian religion, according to the results of the last demographic census carried out in the country (Brasil, 2010), there are more than fifteen kinds of religion with Catholicism as the majority (64%) followed by the evangelicals (22.2%). The spiritists officially represent about 3% of the population and the Afro-Brazilian religions are included in this category. Nevertheless, this diversity of religious dogmas and doctrines does not prevent people from transiting between various religions (Mota et al., 2012), and in daily life, many Catholics attend the spiritist religions and vice versa. Steil (2001, p. 124) observes that the present religious miscegenation in Brazil stems from an attitude that is typical of Brazilians: instead of isolating themselves in dogmas, they prefer to seek an "affective authenticity in incorporated spiritual experiences."

Even though the psychology of religion has been very productive in the last decades, we observe a predominance of qualitative studies (Paiva and Freitas, 2019), and the increase of quantitative studies are more recent (Esperandio and August, 2017). Various scales that evaluate the role of religiosity and spirituality in peoples' lives have been carried out and validated in the country (Corrêa et al., 2016), e.g., the module of religiosity and spirituality in the instrument of the evaluation of the quality of life -WHOQOL-SRPB (Panzini et al., 2011), Intrinsic Religiousness Inventory (Taunay et al., 2012), Spiritual Well-Being Scale (Marques et al., 2009), Multidimensional Measurement of religiousness/Spirituality (Curcio et al., 2013), Duke Religion Index (Lucchetti et al., 2012), RCOPE (Panzini, 2004; Panzini and Bandeira, 2005), and Brief Scale for Spiritual/Religious Coping (Esperandio et al., 2018). The only scale, among all, that considers the belief in a miracle is the RCOPE, translated, adapted, and validated by Panzini and Bandeira (2005), and originally elaborated by Pargament et al. (2000). Therefore, this is the scale that has been used in Brazilian studies until now to investigate this modality of SRC and its relations with health in quantitative research carried out in the country.

We shall present and discuss two studies carried out in the country about the role of miracle in health contexts to illustrate the importance of the reflections made in this paper. One of the studies was carried out by Leal (2020) and had the aim of evaluating religious-spiritual coping in expectant mothers with fetal congenital malformation (FCM). The study included 99 expectant mothers with FCM of diverse prognoses and 1/3 of the sample having lethal anomalies. The RCOPE scale originally elaborated by Pargament et al. (2000) and later translated and validated for Brazil by Panzini and Bandeira (2005) was applied *in toto*. The results showed that 92.8% of the sample presented positive coping strategies (PSRC), and only 7.2% presented negative coping strategies (NSRC).

Item 45 of the scale referred to, originally developed to evaluate NSRC, examines if the expectant mother prayed for a miracle: "I prayed for a miracle." It was found that 89% of the expectant mothers (i.e., 88 out of 99) responded affirmatively to this item. Out of this number, 91.2% (81/89) presented PSRC and only 7.8% (7/89) presented NSRC. No socioeconomic, epidemiologic, or clinical condition was statistically significant to identify the profile of the women that prayed for a miracle. However, as we see in **Table 1**, there was a positive correlation

TABLE 1 | Correlation of the factors of Spiritual/Religion Coping (SRC) and praying for a miracle.

Spiritual/Religion Coping	Factor	Spearman (r) correlation	*p*
Positive	Self and/or one's life transformation	0.51	0.001*
	Actions in search of spiritual help	0.42	0.001*
	Offer of help to other	0.34	0.01*
	Positive stance before God	0.48	0.001*
	Personal search of spiritual growth	0.50	0.001*
	Actions in search of institutional other	0.49	0.001*
	Personal search for spiritual knowledge	0.37	0.001*
	Removal through God, religion or spirituality	0.49	0.001*
Negative	Negative re-evaluation of God	0.11	0.27
	Negative stance before God	0.43	0.001*
	Negative re-evaluation of the meaning	0.14	0.15
	Dissatisfaction with the institutional other	0.21	0.04*

*Reproduced from Leal (2020, p. 73). *Statistically significant correlation.*

between "pray for a miracle" and all the positive factors of coping (PSRC) – where we find "self-transformation or transformation of one's life" and "removal of the problem through God, religion, or spirituality." The correlations between "pray for a miracle" and negative factors of coping (NSRC) were positive for only two of them: "negative attitude before God" and "dissatisfaction with other and/or institution." Such results point out that the act of praying for a miracle presents significant positive aspects for expectant mothers with FCM, and much less negative ones, in contrast to what would be initially expected from its original classification as NSRC in the scale originally elaborated in the North American context and later translated for Brazil.

Another study carried out in the Brazilian context also addresses the subject of miracle and aimed at integrating the quantitative and qualitative aspects in two phases in the same study. To evaluate the religious-spiritual coping among family members of children under chemotherapeutic treatment for cancer (Jaramillo, 2019; Jaramillo et al., 2019), they employed the same scale of Pargament et al. (2000) translated by Panzini and Bandeira (2005), for an analysis of nomothetic nature. The second stage was conducted with a study of idiographic nature through interviews with some family members who responded to the RCOPE scale. The first stage counted on the participation of 64 caregivers where an SRC of 3.7 was found, with 3.4 being the medium of PSRC, and two being NSRC. The difference found between PSRC/NSRC was 0.6 which points to the predominance of negative strategies of coping, which was from the point of view of statistical analysis, attributed to the high frequency of the act of praying for a miracle accompanied by a negative stance before God when the miracle does not occur.

In the second stage where interviews were conducted with 14 family members, permitting a qualitative, dynamic, and contextual analysis (Jaramillo, 2019; Jaramillo et al., 2019), it was found that: (a) the belief in a miracle was often associated with biblical readings and this provided more internal control of emotions and afflictions; (b) the belief in a miracle enabled the family members to identify little victories experienced by the child, in such a way that the overcoming of the various stages of treatment could be interpreted as real miracles, making for a constant resignification of experiences, and as such in consonance with the concept of the search for meaning in spirituality. Curiously, even when the miracle that was experienced as a manifestation of hope and resignification, is manifest in the speeches of patients and caregivers, based on their analyses of a more quantitative nature, the authors maintained the interpretation about the "act of praying for a miracle" as an NSRC strategy, justifying that the prayer for a miracle occurs due to the fear of death and its respective negation.

DISCUSSION AND CONCLUSION

Various aspects need consideration in understanding the results of the studies referred to above. We must emphasize here the risks of a previously established classification including the item "I prayed for a miracle" in the group of strategies of NSRC independent of any cultural and situational contextualization. It was seen in the first study that this item was much more correlated positively with the other items classified in the group of the PSRC than the set of the NSRC. And in the second study, it was seen that the results of qualitative nature showed various positive impacts of the act of praying for a miracle in the perception of the interviewees. The bias of an early classification that negatively connotes the belief in a miracle ignores all the multiplicity of its aspects and facets that were previously mentioned in sub item 3 of this study. It reveals the danger of a nomothetic evaluation that promotes a kind of crystallization of the negative interpretation of the act of praying for a miracle. This danger is more poignant when it substitutes a more effective effort of seeking to understand and qualify the way this experience is lived by patients or caregivers, considering in-depth the existential and sociocultural aspects related to such experiences.

In the first study referred to, even though it did not include a second stage, of a qualitative and idiographic nature (Leal, 2020), it sought to reflect on the results found and raises the hypothesis that in a certain way, for expectant mothers with malformed fetuses, the belief in miracle can be, in a certain manner, a way of warding off reality but without necessarily negating it, enhancing a kind of continuum from the prenatal to the puerperium where hope can be nurtured; so that birth and first care of the baby may be less distressing. And in the process, make possible a resignification of life in cases of lethal FCM where the expectant mother may recognize to have exercised maternity, be it for a short time (Leal, 2020). Or still, under another aspect, the experience of "praying for a miracle" occurs initially as an act of openness to life instead of the immediate closure of a bleak perspective imposed by a technical and scientific perspective. This openness is sound from the psychological and existential point of view in so far as through it, there is also the time necessary to confront the realities of FCM.

In the second study, even though they included a second stage of qualitative nature, the authors (Jaramillo, 2019; Jaramillo et al., 2019) ended up giving more emphasis to the results obtained from the scale and accentuating the negative interpretation of the act of praying for a miracle. The danger in this, from an epistemological point of view, is reinforcing a kind of orthodox faith in science that attempts to classify and quantify, and in this specific case, generalize the principle that coping focused on emotion is always negative. Another danger, now from the practical point of view, is reinforcing a dichotomy between positive and negative, which can create a great barrier in the relationship between health professionals and patients, by stigmatizing the act of praying for a miracle and always taking it as a desire for something supernatural in detriment to medical knowledge. The professional entangled in this dichotomy may fail to see clinical aspects essential to the quality of his or her care of the patient or family members. He or she may, for example, be completely blind to one of the aspects pointed out by Delisser (2009): the caregiver or patient, on referring to his or her desire for a miracle, maybe communicating both the wish of being an optimist and hopeful in the attempt of maintaining a positive attitude in the face of a grave illness, and also the sentiments

of anger, frustration, or disappointment with the care given by the medical team.

It should be admitted, therefore, that the classificatory questionnaires do not encompass all the complexity of the belief in a miracle and may spark misguided interpretations about what the patient or caregiver is seeking in fact: whether an internal elaboration for better handling of the situation; a temporary delegation until he or she is more strengthened to take charge of his or her responsibilities; a negation of the gravity of his or her illness; or to simply offer a response that confronts consciously or unconsciously the previous conceptions of the health professionals. After all, in the context of the medical sciences, more and more specialized and technical, (Clarke, 2018), a veritable stratification of illnesses and patients' and caregivers' behaviors can be verified, based on studies that quantify incidences and prevalence, but without considering how the experience of illness can affect the patient and caregivers. In the specific context of managing the belief in a miracle, this is well illustrated in the study of Green (2015), where it is observed that various nurses in the neonatal intensive care unit tended to be nervous only on the pronunciation of the word "miracle." These prejudices end up bolstering reactive mechanisms in patients, who may respond antagonistically, preferring to deposit their faith and hope in divine miracle than share with the medical team the same faith that the latter deposit in secularized science (Dzeng and Booth, 2018). In a certain way, such situations remind us of what Grinstead (2018, p. 70) rightly affirms: "While medicine's emphasis on scientific rigor and evidence-based practice is helpful in many wondrous ways, it must also allow a space for the ineffable qualities of human existence."

We emphasize, therefore, the necessity of broadening and intensifying qualitative studies (Clarke, 2018) on the effective role of the belief in a miracle, properly contextualized culturally, and which also promotes more articulation between spirituality/religion and the medical sciences, especially when both seek the same end: caring for the human being (Grinstead, 2018). Among the qualitative initiatives, we highlight the contribution of studies of phenomenological nature for offering a wider and deeper vision of the experience lived by patients or caregivers and seeking a convergence of knowledge from other areas of study like theology, psychology, and medicine to better understand the different contexts in which the desire for a miracle is manifest and its most intimate meanings for the individual:

"When clinicians incorporate a basic understanding of phenomenology into their approach to a patient or their surrogate's resolute insistence to wait for a miracle, this theoretical underpinning may form a foundation for building a mutual understanding with the miracle seeker, as well as a reverence for the inherent mystery of the wide spectrum of human experience" (Grinstead, 2018, p. 70).

In this way, a phenomenological understanding of the belief in a miracle can promote comprehension of the mechanism of religious-spiritual coping beyond a mere dichotomic judgment between "positive" or "negative", addressing other relevant existential aspects like the degree of subjective and intersubjective flexibility or inflexibility that the individual demonstrates in the face of stress; how the belief in miracle is sustained by a genuine sentiment of spirituality or religious faith; how this faith is sustained by the necessity of attributing the search for meaning to illness or bleak diagnosis, enhancing the hope to manage desolating sentiments like anguish, guilt, or anger of an FCM pregnancy or having a child with cancer independent of a previous classification from the locus of external or internal control or of passive or active attitudes.

"Hope for miracle" for mothers with FCM or family members of children with cancer can be a manner of shying away from reality without denying it, and constitute part of a process of psychic adaptation to suffering and culminating into the search for the meaning of lived experience, and often represented in the peak of resignification through maternal love. It can also be a kind of network support where family members nurture the hope of the patient still under the impact of the sad diagnosis. Thereby, their prayers for a miracle, fortify affective bonds and the reciprocal hospitality between them until they are emotionally more prepared to handle the limits or complete impossibility of reversing the diagnosis. This process can be healthy when it gradually permits an internal elaboration that propels a resignification of the diagnosis in the lives of all the people involved.

Nevertheless, the negative aspect of hope in a miracle is also observed in clinical practice when the expectant mother or family member of the child with cancer (or other bleak diagnoses) insistently seeks the improbable cure, even in the face of medical evidence to the contrary. When such a search is based only on the dogmas that some religious institutions adopt and encourage, remaining static, anchored on a linear interpretation of "miracle," at the service of traditions and orthodoxy inclined to religious fundamentalism, it can be problematic, closed to the process of resignification over time. In this situation, the locus of external control and the passive attitude is harmful to the psychological adaptation of the patient or of the family member since the focus is not transcendence but on the pragmatic result desired by him or her and then based on a religious doctrine.

The nature of the impact of the belief in miracle turns out to be not only of the accountability of the patient and family members but also of the health professionals. And in this sense, the reports of some professionals in studies of phenomenological nature carried out by Freitas (2021) are paradigmatic. Curiously, when some of them were interviewed about the nature of the relations established between religion and health, based on their clinical experiences, they replied that the relations can be of a positive or negative nature, healthy or not, depending on the approach of each professional and the quality of his or her practice in handling the religiosity of the users of health services. It can be seen from this kind of response that, instead of being simply grounded in the mere dichotomy between science and religion, there is a honest self-accountability of the professional in the process of care of the patient and his or her caregiver. In this process, the health professional takes on the competency and responsibility of not only the strict technical-scientific knowledge, but also the development of cultural and existential skills in the management of complex situations, avoiding the mere underpinning of linear, reductionist, dichotomist, and or hegemonic models.

AUTHOR CONTRIBUTIONS

MF conceived the idea of the study and supervised the project. ML and GdM designed the statistical analysis. EN drafted some parts of the manuscript especially those connected with theology, collaboration in the final revision, and translation to English. MF wrote the manuscript with the help of ML and EN. All authors contributed to the final manuscript, each with a specific focus.

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Case Study of Recognition Patterns in Haunted People Syndrome

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Haunted People Syndrome (HP-S) denotes individuals who recurrently report various "supernatural" encounters in everyday settings ostensibly due to heightened somatic-sensory sensitivities to dis-ease states (e.g., marked but sub-clinical levels of distress), which are contextualized by paranormal beliefs and reinforced by perceptual contagion effects. This view helps to explain why these anomalous experiences often appear to be idioms of stress or trauma. We tested the validity and practical utility of the HP-S concept in an empirical study of an active and reportedly intense ghostly episode that was a clinical referral. The case centered on the life story of the primary percipient, a retired female healthcare worker. Secondary percipients included her husband and adult daughter, all of whom reported an array of benign and threatening anomalies (psychological and physical in nature) across five successive residences. Guided by prior research, we administered the family online measures of transliminality, sensory-processing sensitivity, paranormal belief, locus of control, desirability for control, and a standardized checklist of haunt-type phenomena. The primary percipient also completed a measure of adverse childhood events and supplied an event diary of her anomalous experiences. We found reasonably consistent support for HP-S from a set of quantitative observations that compared five proposed syndrome features against the family members' psychometric profiles and the structure and contents of their anomalous experiences. Specifically, the reported anomalies both correlated with the family's scores on transliminality and paranormal belief, as well as elicited attributions and reaction patterns aligned with threat (agency) detection. There was also some evidence of perceptual congruency among the family members' anomalous experiences. Putative psi cannot be ruled out, but we conclude that the family's ordeal fundamentally involved the symptoms and manifestations of thin (or "permeable") mental boundary functioning in the face of unfavorable circumstances or overstimulating environments and subsequently acerbated by poor emotion regulation, histrionic and catastrophizing reactions, and active confirmation biases.

Keywords: anomalous experiences, entity encounters, hauntings, paranormal belief, transliminality

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INTRODUCTION

This paper examines a real-life and rather remarkable "ghost story" via a mixed methods approach that continues our series of studies about people who claim to be haunted by anomalous beings or sentient forces (Laythe et al., 2018; Drinkwater et al., 2019; Houran et al., 2019a,b; O'Keeffe et al., 2019; Ventola et al., 2019; Lange et al., 2020). Some research suggests that outwardly disparate

"(entity) encounter experiences"—e.g., spirits, angels, gods, demons, poltergeists, extraterrestrials, Men in Black (MIB), and folklore–type little people—generally have similar narrative structures (Evans, 1987; Hufford, 2001; Young, 2018) and perceptual contents (Houran, 2000; Houran and Lange, 2001b; Houran et al., 2019a). However, the exact attribution or meaning of these occurrences typically reflects the percipient's religio–cultural milieu, with many people ascribing their experiences to hauntings or poltergeists (collectively termed *ghostly episodes*) (Hill et al., 2018, 2019; Houran et al., 2019a).

To clarify, poltergeist disturbances are clusters of anomalous *subjective* (*S*) experiences (e.g., apparitions, sensed presences, hearing voices, and unusual somatic or emotional manifestations) and *objective* (*O*) events (e.g., object displacements, malfunctioning electrical or mechanical equipment, and inexplicable percussive sounds like raps or knocks), which focus on the presence of certain people (for a recent discussion, see Ventola et al., 2019). Similar *S/O* anomalies that seemingly persist at specific locations are called hauntings (Houran and Lange, 2001a). Researchers traditionally differentiate haunts and poltergeists, but the *S/O* anomalies that characterize each occurrence collectively form a probabilistic and unidimensional hierarchy (Houran et al., 2019a,b). Accordingly, there seems to be a core "encounter" phenomenon that can be described as a syndrome (Laythe et al., 2021a).

These episodes are not uncommon in the general population and have strong supernatural connotations for many people (Hill et al., 2018, 2019; Houran et al., 2020). Research indicates that singular or sporadic haunt-type experiences can be induced for clinical, leisure, research, or transpersonal purposes by means of *suggestion–expectancy effects* (Houran et al., 2020), *transcerebral magnetic stimulation* (Persinger et al., 2000), *creative dissociation* (Maraldi and Krippner, 2013), *psychedelic use* (Davis et al., 2020), *channeling activities* (Pederzoli et al., 2022), *ritual settings* (Caputo et al., 2021), and *environmental psychology* (Dagnall et al., 2020). However, individuals with recurrent encounter experiences or ghostly episodes over time and under naturalistic and spontaneous conditions possibly represent a more complex or nuanced process. We speculate that such instances involve the hypothesized concept of "Haunted People Syndrome" (HP-S) (for overviews, see O'Keeffe et al., 2019; Lange et al., 2020; Laythe et al., 2021a).

Following systems (or biopsychosocial) theory, Laythe et al. (2021a) used their grounded theory interpretation of recent empirical research to describe HP-S as an cognitive–affective phenomenon involving transliminal perceptions ("the right people") that are structured due to attentional and perceptual mechanisms, and facilitated by transliminality-conducive environments ("the right settings"), which often produce a self-reinforcing loop ("psychological contagion") that is contextualized and reinforced by attributions of external agency ("belief in the paranormal") as a coping mechanism. Put succinctly, the interaction among sensory-somatic sensitivities, situational context, and social milieu prompts certain individuals to endorse paranormal agents or entities as the preferred explanation for the perceived complexity (i.e., ambiguities or anomalies) in their environments. This model essentially equates spontaneous ghostly episodes to some of the fundamental mechanisms that stoke outbreaks of mass (contagious) psychogenic illness (Lange and Houran, 1998, 1999, 2001a), although the flurries of symptom perception in HP-S appear to be mostly self -induced and -sustained.

Active haunt–type occurrences that are available for scientific scrutiny are quite rare, especially those involving dramatic somatic phenomena (see e.g., Nisbet, 1979; Amorim, 1990; Mulacz, 1999; Houran, 2002; Houran et al., 2019b, 2002b; Taff, 2010; Ritson, 2020). But an account fortuitously came to our attention that allowed us to empirically test the practical utility and predictive validity of the current HP-S model with quasi-longitudinal data. This study thus compares the onset (*macro-phenomenology*) and contents (*micro-phenomenology*) of a particularly intense spontaneous case, which has persisted for over a decade, to the five proposed features (or recognition patterns: Carleton and Webb, 2012) of HP-S as outlined by Laythe et al. (2021a, 2022). We specifically hypothesized that the phenomenology of this ghostly episode—labeled the "San Antonio Disturbances"—would show that:

a. Transliminality and reinforcing Paranormal Beliefs mediate percipients' anomalous experiences.
b. "Dis-ease" (notable but sub-clinical levels of stress) is a catalyst for the onset of anomalous experiences.
c. Diverse anomalous experiences are involved that exhibit temporal patterns suggestive of psychological contagion.
d. Attributions for the anomalous experiences align to the percipients' biopsychosocial milieu.
e. Percipients' anxiety levels relate to the nature, proximity, and spontaneity of their anomalous experiences.

SYNOPSIS OF THE SAN ANTONIO DISTURBANCES

Correspondence with the afflicted family during introductions and early data collection quickly revealed that this case centered on the life story—or what could be deemed a narrative identity (Dunlop, 2017), personal myth (Krupelnytska, 2020), or illness narrative (Shapiro, 2011)—of the primary percipient named *Nell* (pseudonym, age 57). Secondary percipients included Nell's daughter from her first marriage (*Jill*, age 37) and her second husband (*Rod*, age 70). The San Antonio family highlighted the anomalous events that have haunted them for the last ten years, but the case actually began in Nell's childhood. Below we detail her psychosocial history from previous medical records and many days of structured interviews and impromptu discussions.

A biomedical (or generally skeptical) perspective might assume that Nell's anomalous experiences are delusions or hallucinations from an unmanaged mental health issue (e.g., a thought or personality disorder) or medical condition (e.g., an acquired brain injury from trauma or stroke). However, the available evidence does not immediately support these

TABLE 1 | Diagnostic impression of the primary percipient per independent assessment (dated 20 March 2020).

Diagnostic impression	Diagnosis given as Delusional Disorder (F 297.1), persecutory type, with bizarre (implausible content) continuous. Does not meet criteria for: chronic psychosis, schizophrenia, psychotic disorders, psychotic related mood disorders, substance induced psychoses, delirium, organic cases of acute paranoia, major minor neurocognitive disorders, malingering, factitious disorder, and personality disorders
Contextual observations/ etiological opinions	Opines phenomena as likely hypnopompic and hypnogogic hallucinations, citing relationship between times of rest and phenomena as a potential explanation. States, "the subjective belief that they were experienced [the phenomena] as she recounts them is itself delusional". Opines with regards to family experience of phenomena as a case of shared delusional disorder. Cites cognitive memory error as explanation for early childhood paranormal experiences of daughter and mother and misinterpretation of experiences. Notes no pharmacologic treatment. Anti-psychotics not recommended due to lack of cognitive symptoms, or psychotic symptomology beyond reported paranormal experience
Recommendations	Recommends counseling, with subject open to possibility of hypnopompic/hypnogogic experience, and culturally sanctioned supernational beliefs with confabulatory memories, and a debriefing. Notes belief system is entrenched, but overall functioning is deemed "good"

speculations. **Table 1** summarizes the independent findings from a Texas Board certified psychiatrist, who conducted a diagnostic impression of Nell on 20 March 2020. This type of assessment involves an interpretive statement based on previous and current evaluative data, which may or may not reference criteria in the *Diagnostic and Statistical Manual of Mental Disorders* (*DSM-5)* or *International Classification of Diseases* (*ICD-10*). The psychiatrist's evaluation included letters from the family's church, interviews with both Rod and Jill, as well as email communications and face–to–face assessment.

Nell was subsequently given the provisional diagnosis of delusional disorder, i.e., an exclusively present belief system that is not culturally congruent with medical science, while lacking all other symptoms of psychosis or mood related disorders. Personality and somatic disorders were further ruled out by the psychiatrist. Also relevant in the clinical report is the assumption of a shared delusional disorder that attributes the family's anomalous or altered experiences to confabulatory memory or hypnogogic–hypnopompic episodes (cf. Hufford, 2001). We note that the psychiatrist's explanation for Nell's claims is culturally dependent on the assumption that her perceptions are incompatible (or impossible) within a medical model.

Nell's Early History of Encounter Experiences

Nell grew up in a family that spoke openly about paranormal experiences. In fact, her childhood home was allegedly haunted along with the two adjacent houses. She later explained how UFOs would also be frequently seen in the neighborhood, with many residents gathering together to watch them at night. However, the number of anomalous events that Nell reported during her Childhood and Teenage years was low. **Table 2** presents an aggregated history of Nell's encounter experiences starting in childhood, with one exceptionally memorable event involving her toy doll that reportedly "came to life and snarled at her."

Although Nell never claimed to have imaginary companions (IC), her doll and some other toys appeared to be "personified objects." Social scientists subsume this behavior under the IC rubric (Moriguchi and Todo, 2018), and both personified objects and traditional ICs have been linked to ghostly episodes or encounter experiences in childhood (Young, 2018; Laythe et al., 2021b; Little et al., 2021). Nell continued to have multiple encounter experiences throughout her teenage years and early adulthood. Overall, these early encounters tended to occur when she was alone. As examples, she talked about how "something" would sit on the bed towards her legs and stroke them, whereas many other times she would hear a male voice call out her name in a thick whisper from the stereo speakers.

Nell's Later History of Encounter Experiences

Table 2 shows that Nell's anomalous experiences increased in frequency during Young Adulthood and then grew exponentially in later Adulthood. The central events in this case began in 2011 at "Residence A." This was the first of the family's five residences ("A to E") due to successive moves in an attempt to escape the presumed paranormal activity. Nell explained the beginning of the family's past 10-year saga this way:

> One day we decided to look on the property that was directly in back of my house [Residence A]. We had a tall wooden privacy fence that enclosed my entire yard, sides, and back with a gate to the back far right. We ["Nell, Rod, Jill and Jill's then boyfriend Warren"] went through that gate and there were hanging tree branches, tall weeds, and grass. It smelled like fresh horse manure about 20–30 feet into this area, but no horses were anywhere. We walked around and saw excess amounts of old leftover building supplies, bits, and pieces. I told the others that I was going home as I did not like it there, but they stayed to prowl around.
>
> A week or so later a man came to my front door and introduced himself. He was dressed in a suit-style black leather jacket, a black ribbed turtleneck shirt, gold chain and medallion, black pants, and boots—in scorching hot August weather in Texas! He spoke to my husband and had a very heavy Russian or Eastern European accent. I did not speak to him but stood in the background to listen. Rod said that this man told our neighbors and the mailman to keep off his property to avoid injuries or accidents. He left me with an "unnerving feeling." Another time this same man also spoke to my daughter in her backyard saying it was good that she had guard dogs for protection.
>
> Soon after, the series of mysterious events began with a bite to my left breast while I was sleeping with my cat, and Rod was away working offshore on an oil rig. The next morning, I could see teeth marks above and below the areola. Jill saw it too, but we did not think to take a picture. The following

TABLE 2 | Mean characteristics of the primary percipient's history of encounter experiences.

	Number of memorable events	Event type[a]	Setting[b]	Context[c] (% of experiences coinciding with distress or eustress)	Proximity[d]	Fear/anxiety[e]
Childhood	5	1.6	1.2	0	1.2	3
Teenage	11	1.5	1	0	1	3
Young adult	24	1.2	1.4	0.38 (Distress = 08% Eustress = 29%)	1.4	2
Adult—"Residence A"	13	1.2	1.4	0.92 (Distress = 43% Eustress = 43%)	1.3	2.2
Adult—post "Residence A"	315	1.8	1.7	0.37 (Distress = 27% Eustress = 10%)	1.5	1.9

[a]*Event Type: "subjective/psychological = 1, objective/physical = 2".*
[b]*Setting: "experienced alone = 1, others present = 2".*
[c]*Context: "notable stressors, emotions, or situations happening at the time = 1, no notable stressors, emotions, or situations happening at the time = 0".*
[d]*Proximity: "event occurred inside personal space = 1, event occurred outside personal space = 2".*
[e]*Fear/Anxiety: "not at all anxious/scared = 0, a little anxious/scared = 1, somewhat anxious/scared = 2, very anxious/scared = 3".*

TABLE 3 | Perceptual-personality profiles of the afflicted family members.

	Revised Transliminality Scale (*M* = 25, *SD* = 5)	Highly Sensitive Person Scale (*M* = 4.09, *SD* = 0.83)	Rasch—Tobacyk's Revised Paranormal Belief Scale[a] (*M* = 25, *SD* = 5)	Desirability for Control Scale (*M* = 100, *SD* = 10)	Rotter's Locus of Control Scale (*M* = 11.5, *SD* =)
Nell (Primary experient)	30.9	*M* = 2.85 (Raw total = 77)	*NAP* = 31.89 *TPB* = 43.24	87	6
Rod (Secondary experient)	25.7	*M* = 4.63 (Raw total = 125)	*NAP* = 28.24 *TPB* = 39.23	95	10
Jill (Secondary experient)	25.7	*M* = 3.22 (Raw total = 87)	*NAP* = 31.89 *TPB* = 29.02	87	6

[a]*NAP, New Age Philosophy; TPB, Traditional Paranormal Beliefs.*

night there was a loud crash at about 3 a.m. in the morning. It sounded like my huge China cabinet had been tipped over, a loud crashing sound that scared me something terrible. I got up to see what happened and saw the light in my office was on. This room is directly across from my bedroom, and it was filled with dense, deep amber-color whirling fog from floor to ceiling. I phoned Jill who lived next door to get over there and help me to get the cat and myself out. She came and also saw the fog. We booked it to her house, and I called Rod offshore to tell him to get home. He arrived about a day-and-a-half later, and the fog was still there and only in that room. The fog started to subside on the third day. Also, Jill had two German rottweiler blockhead dogs, and the male dog died of an apparent drug overdose afterwards. He was found in her backyard with blood coming out of its mouth. It all seemed like such strange timing.

Nothing unusual was happening in our lives before and during this. Rod and I were working, and Jill and the kids seemed happy in their home . . . we all had dinners at my house and BBQs, nothing that stood out as anything abnormal. It was after the fog appeared that all hell broke loose. It seems to me that it came from that property, that something was released, being the only logical cause to me. I know it sounds odd, but this whole thing is very odd and to continue after all these years and seems to follow us and intensify more as time passes . . . and even when it seems to simmer down a bit, it will rear its ugly head and something new or different will start up. After so long, certain things you have to learn to accept and attempt to continue with life, but when it affects you physically as well that is a different situation. It causes you to dramatically age physically, mentally, emotionally and spiritually. Well, at least to me it has, and it is unfortunately very visible (J. Houran, personal communication, 14 June 2021).

As documented in more detail in a later section (cf. **Table 6**), subsequent anomalies experienced by Nell and her family included near daily occurrences of apparitions, sensed presences, negative feelings, threatening tactile sensations, unusual odors, and object displacements. They also claimed that their security camera recordings would often show "phantom voices and figures." The family members reportedly experienced these and other anomalies both when they were alone and together. A marked upsurge in Nell's encounters is attributable to the period "Post-Residence A." This might suggest the presence

of strong context effects, such as attentional or confirmation biases (Lange and Houran, 2001a). Experiences in Post-Residence A largely involved *O* phenomena that contrasted with her Childhood and Teenage accounts which were a mixture of *S/O* anomalies, and her Young Adult-Residence A experiences of mainly *S* events. Nell's Childhood and Teenage experiences happened alone, her Young Adult and Adult-Residence A occurred both alone and with others, and the Post-Residence A experiences mainly occurred in the presence of others. Regarding proximity, most of Nell's experiences during her Childhood and Teenage years reportedly happened within her personal space, whereas her Young Adulthood and Adulthood (Residence A and Post-Residence A) experiences occurred variously within and outside her personal space. Finally, Nell's anxiety–fear was reportedly highest ("very anxious/scary") during her Childhood and Teenage years, while the levels during her Young and Later Adulthood time periods were associated only "somewhat" with anxiety–fear.

METHOD

Case Information

On 31 May 2021, the first author was contacted by the Director of the "Paranormal Phenomena Research and Investigation" team after searching for names of "clinical parapsychologists" on the Parapsychological Association website. This group was working with "a female from Texas who was looking for assistance with a haunting situation" and they concluded from their initial evaluation that the case required a researcher with counseling expertise because it involved "a small amount of anomalous activity" combined with pronounced "psycho-social factors" (personal communication to J. Houran). The first author then enlisted the assistance of the second author, who is a forensic psychologist and Director of the Institute for the Study of Religious and Anomalous Experience (ISRAE)—a registered not-for-profit dedicated to academic research and public education.

The authors accepted the referral after first determining that the circumstances likely did not involve a mental disorder with religious themes, as well as gaining approval from the afflicted family for the arrangement. The outline and goals for this study were subsequently approved by Ethics Committee at ISRAE to guarantee compliance with ethical guidelines proposed for this subject area (Baker and O'Keeffe, 2007), including informed consent in writing by each family member pertinent to data collection and its subsequent use for research and reporting purposes (Gavey and Braun, 1997). The family's participation was entirely voluntary, involved no financial compensation, and could be stopped at any point. We evaluated and synthesized material from three sources: (a) records provided by the three family members who constituted the primary and secondary percipients in this case, (b) copies of findings and conclusions from a prior investigation by the independent group noted above, and (c) clinical, historical, psychometric, and environmental data that we collected first-hand as outlined below.

Procedure

Laythe et al.'s (2021a, 2022) five presumed features of HP-S were clearly specified prior to the data collection and analysis. Similar to pre-registered studies, this tactic aimed to control for undisclosed flexibility that can lead to revisionist or false discoveries (Nosek et al., 2018). Qualitative studies are popular in the psychological literature on anomalous experiences (e.g., Childs and Murray, 2010; Drinkwater et al., 2013; Eaton, 2019), but some researchers may dismiss such findings as anecdotal information in the absence of rigorous scientific controls and numerical data. In contrast, quantitative research minimizes subjectivity in favor of objectivity by deductively forming a hypothesis derived from theory. Controlled, objective testing and experimentation ultimately supports or rejects the hypotheses under consideration. For these reasons, we adopted a mixed methods approach that primarily used quantitative analyses supplemented with qualitative insights as appropriate.

We further structured our study using the five-step Evidence-Based Practice (EBP) framework (Sackett et al., 1996; Guyatt et al., 2000; Straus et al., 2011). This involves (a) converting information needed into answerable clinical questions; (b) tracking down best evidence for answering the questions; (c) critically appraising the evidence for validity, impact, and applicability; (d) integrating the evidence into clinical decision-making; and (e) assessing the prior steps to improve future efforts. Accordingly, we administered planned and unplanned measures at different points of our study depending on the theoretical or clinical direction the case took. The tasks or assessments that we used were intentionally divvied over time so not to overwhelm the afflicted family. Overall, we spent approximately six months working with the family in research and therapeutic contexts.

After making the initial introductions and obtaining informed consent, we asked the three family members to complete psychometric measures #1–6 described below prior to the authors' in-person visits to the family's residence. As explained in a later section, we administered assessment #7 *post-hoc* to clarify pertinent background information in this case. All measures were administered online. Next, we separately asked Nell to prepare a chronological log of her most memorable encounter experiences from childhood to present-day. This might seem an infeasible or incredulous task, but she was quite confident in her memory of these past and ongoing events. The instructions for this exercise requested that she include the following six details for each of the major anomalous experiences that she could readily recall: (a) *Time Period* ("Childhood, Teenager, Young Adult, Adult-Residence A, Adult- Post-Residence A"), (b) *Anomalous Event* (selected from items 1-32 on the Survey of Strange Events), (c) *Setting* (anomalous event experienced "alone or with others"), (d) *Context* ("notable negative emotions, stress, or dis-ease at the time of the anomalous experience; notable positive emotions, stress, or dis-ease at the time of the anomalous experience; or no notable emotions, stress, or di-ease at the

time of the anomalous experience"), (e) *Proximity* (anomalous events occurred "inside or outside her personal space"), and (f) *Anxiety/Fear* level perceived during each anomalous event (i.e., "very anxious/scared, somewhat anxious/scared, a little anxious/scared, or not at all anxious/scared"). This "event diary" exercise was likewise completed online. Finally, we conducted two separate and extended visits with the family over the course of three, non-consecutive days. These particular interactions aimed to (a) cross-check or clarify their previous responses to the questionnaires, (b) observe their family dynamics, (c) personally assess audio and video "evidence" of the haunting activity that the family had assembled over recent months, and (d) collect environmental readings of physical variables that might contribute to some or all of the family's anomalous experiences (cf. Dagnall et al., 2020; Jawer et al., 2020).

Measures

(1) The 16-item, Rasch scaled version (Lange et al., 2000a) of the *Revised Paranormal Belief Scale* (RPBS) remedies Tobacyk's (1988, 2004) original 26-item, Likert-based form (seven response categories anchored by "strongly disagree to strongly agree"), with an artificial structure of seven factors due to differential item functioning, i.e., sex and age response biases. Correcting these measurement problems with a "top-down purification" procedure using Modern Test Theory, Lange et al. (2000a) showed that the RPBS comprises only two, moderately correlated belief subscales that seemingly reflect different issues of control.

Specifically, New Age Philosophy (NAP) (11 items, Rasch reliability = 0.90) seems related to a greater sense of control over interpersonal and external events (e.g., "Some individuals are able to levitate (lift) objects through mental forces"), whereas Traditional Paranormal Beliefs (TPB) (5 items, Rasch reliability = 0.74) seem more culturally-transmitted and beneficial in maintaining social control via a belief in magic, determinism, and a mechanistic view of the world (e.g., "Through the use of formulas and incantations, it is possible to cast spells on persons"). Several studies support the construct validities of these two subscales (Houran et al., 2000, 2001; Houran and Lange, 2001c), which both have a *mean* of 25 (SD = 5).

(2) *Revised Transliminality Scale* (RTS: Lange et al., 2000b; cf. Houran et al., 2003b) is is a Rasch version of Thalbourne's (1998) original 29-item, true/false scale (Form B). Twelve items from the original scale are excluded from the scoring due to age and gender biases. However, the remaining seventeen test items constitute a unidimensional Rasch (1960/1980) scale with a Rasch reliability of 0.82. These 17-test items, which share a common underlying dimension, span seven domains: Hyperesthesia, (fleeting) Hypomanic or Manic Experience, Fantasy-Proneness, Absorption, Positive (and perhaps obsessional) Attitude Towards Dream Interpretation, Mystical Experience and Magical Thinking. RTS scores (M = 25, SD = 5) consistently predict different syncretic cognitions, somatization and hypochondriacal tendencies, and lower psychophysiological thresholds (Houran et al., 2002a; for overviews, see Evans et al. (2019), Lange et al. (2019)).

3. *Survey of Strange Events* (SSE: Houran et al., 2019b). This is a 32-item (T/F), Rasch-scaled measure of the overall intensity of a ghostly account or narrative via a checklist of subjective and objective (*S/O*) events or experiences inherent to these anomalous episodes [e.g., sample items include "I felt odd sensations in my body, such as dizziness, tingling, electrical shock, or nausea (sick in my stomach" and "I saw objects breaking (or discovered them broken), like shattered or cracked glass, mirrors or housewares," respectively]. Specifically, the SSE's Rasch hierarchy represents the probabilistic ordering of *S/O* anomalies according to their endorsement rates but rescaled into a metric called "logits." Higher logit values signify higher positions (or progressively lower likelihood of endorsement) on the Rasch scale (Bond and Fox, 2015). We refer readers to our previous papers for details on the development and utilization of this instrument (Houran et al., 2019a,b, 2021).

Rasch scaled scores range from 22.3 (=raw score of 0) to 90.9 (=raw score of 32), with a mean of 50, SD = 10, and a Rasch reliability = 0.87. Higher scores correspond to a greater number and intensity of anomalies that define a percipient's experience. Supporting the SSE's content and predictive validities, Houran et al. (2019b) further found that the phenomenology of "spontaneous" accounts (i.e., ostensibly "sincere and unprimed") differed significantly from "control" narratives from "primed conditions, fantasy scenarios, or deliberate fabrication." Follow-up studies with the SSE also support its value for thematic analyses of qualitative reports (O'Keeffe et al., 2019; Lange et al., 2020; Laythe et al., 2021b; Little et al., 2021).

4. *Desirability for Control Scale* (DCS: Burger and Cooper, 1979) has 20 items that measure individual differences in the general level of motivation to control the events in one's life. The desire for control is a general personality trait, relevant to many behaviors studied by both social and clinical psychologists. Much research and theory suggests that an increase in perceived control is preferred and results in positive reactions, whereas a decrease in control is not desired and leads to negative reactions. Sample items include "I try to avoid situations where someone else tells me what to do" and "I wish I could push many of life's daily decisions off on someone else." The scale is reported to have good internal consistency (0.80), test-retest reliability (0.75), and discriminant validity from measures of locus of control and social desirability.

5. *I-E Scale* (Rotter, 1966) measures generalized internal–locus of control, or the extent to which individuals believe that they can control events that affect them. Externals believe that outcomes are beyond their control, whereas internals believe they can influence outcomes. Researchers have both modified the scale in various ways over the years (Marsh and Richards, 1986) and debated its dimensionality (Marsh and Richards, 1987), but we opted for the original

29-item (unidimensional), forced-choice version (with six filler items) that is the most often used (Wang and Lv, 2017). Sample items include "Many of the unhappy things in people's lives are partly due to bad luck" and "When I make plans, I am almost certain that I can make them work." Scores range from "0" (internality) to "23" (externality), and the measure shows satisfactory psychometric properties from a Classical Test Theory perspective (e.g., Rotter, 1975).

6. *Highly Sensitive Person Scale* (HSPS: Aron and Aron, 1997) assesses physiological reactivity to stimuli in the environment (e.g., "Are you easily overwhelmed by strong sensory input?") and subtle reactivity (e.g., "Do you become unpleasantly aroused when a lot is going on around you?"). Respondents respond to 27 items, indicating how much the situation described in each applies to them, using a 7-point Likert scale ranging from "1 (not at all) to 7 (extremely)." Scores are normally calculated as the average of the 27 ratings, but alternatively the scale's total value can be used to create a dichotomous variable representing two groups (low vs high sensitivity). Note that the total value has also been used as a continuous variable in some research (e.g., Jagiellowicz et al., 2011). Several studies support the tool's reliability and content validity (e.g., Aron and Aron, 1997; Smolewska et al., 2006).

Respondents answer a series of questions, indicating how much the situation described in each applies to them, using a 7-point Likert scale ranging from "1 (not at all) to 7 (extremely)." Example questions are: "Are you easily affected by other people's moods?", "Do you find loud noises uncomfortable?", and "Are you aware of subtle changes in your surroundings?" The scale gives a total value, which is used to create a dichotomous variable representing two groups (low vs high sensitivity), but the total value has also been used as a continuous variable in some research (e.g., Jagiellowicz et al., 2011). Several studies support the tool's reliability and content validity (Aron and Aron, 1997; Smolewska et al., 2006).

(7) *Survey of Traumatic Childhood Events* (STCE: Council and Edwards, 1987) is a 30-item retrospective measure of the occurrence and frequency of 11 types of aversive childhood experiences, i.e., intrafamilial sexual abuse, extrafamilial sexual abuse, intrafamilial physical abuse, loss related to a friend, loss related to the family, isolation, personal illness or accident, parental divorce/separation and abortion/miscarriage, (extrafamilial) assault, loss of the home, and robbery. Responses on the STCE are made on a five-point scale (1 = "none" to 5 = "more than ten"). Note that items #29 and 30 are multiplied together to give a single variable; item 29 is a trauma occurrence variable, whereas item 30 gives the length of time this trauma lasted. Also, some items are potentially sensitive, such as those concerning sexual abuse, so the instruction sheet was designed with particular sensitivity in mind to such ethical issues.

There are no published psychometric data on the STCE—only descriptive information (e.g., Irwin, 1992; Thalbourne et al., 2003; Dorahy et al., 2004)—and research on the prevalence and adulthood sequelae of childhood trauma has been criticized for the use of assessment instruments with unknown psychometric properties (Scher et al., 2001). Nevertheless, the STCE seemed the best instrument for our purpose as it covers perhaps the broadest range of traumatic events of any of the available childhood trauma questionnaires.

RESULTS

The following subsections compare relevant details of this case to the five presumed recognition patterns of HP-S. This format should help readers to better follow our arguments and make clearer distinctions in the array of technical or nuanced information considered here. Some analyses are statistically underpowered, so we encourage readers to mainly focus on the direction and size of the effects from attenuated *r* statistics. Further, degrees of freedom are clearly marked in all analysis in order to guide the reader with regards to statistics that are suggestive but lacking in robust sample sizes.

Preliminaries

Haunt-type occurrences always involve the risk of fraud for various motivations (Roll, 1977; Nickell, 2001), but we neither have evidence of deliberate deceit nor do we suspect a factitious component here. Indeed, an evaluation of key patterns in Nell's anomalous experiences using the Decision-Tree Process in Houran et al. (2019b, p. 180) indicated that this case can be classified with 90% accuracy as a "non-illicit episode." This means that the events addressed in this paper are likely not to be explicitly fraudulent. However, this heuristic does not clarify whether the case is genuinely spontaneous versus rooted in active priming or pure imagination.

As the family became increasingly comfortable during our interactions, they started to elaborate on their psychosocial and medical histories, anomalous experiences, and the quality of their familial relationships. These spontaneous and sporadic disclosures indicated that Nell almost certainly minimized or omitted some of the information on the questionnaires in an attempt at impression management. This is a response bias that reflects the tendency for individuals to answer questions in a manner that will be viewed favorably by others, such as over-reporting "good or desirable" behavior or under-reporting "bad or undesirable" behavior. Thus, it poses serious problems when conducting research with self-reported information that pertains to unusual, atypical, or "unlikely" experiences, or in response to demand characteristics (Merckelbach et al., 2017). Specifically, it appeared that Nell wanted to emphasize the intense and mysterious nature of her experiences while not coming across as "crazy" (for discussions of this issue, see Roxburgh and Evenden, 2016a,b). Our initial findings and interpretations therefore often required re-examination and synthesis beyond the data originally collected with the questionnaires.

Feature 1: Transliminal Perceptions Reinforced by Paranormal Belief

Transliminality is currently described as "a hypersensitivity to psychological material originating in (a) the unconscious, and/or (b) the external environment" (Thalbourne and Maltby, 2008, p. 1618). This perceptual-personality variable thus parallels and correlates with Hartmann's (1991) mental boundary construct (Houran et al., 2003a), as well as involves Aron and Aron's (1997) concept of sensory processing sensitivity. Note that Transliminality ostensibly acts as both a state and trait variable (Evans et al., 2019), meaning its effects can fluctuate with variations in an individual's situational context. High transliminals show lower psychophysiological thresholds or neurological gating across various settings, but those with low-to-average levels are expected to show an increased *frequency* or *intensity* of such perceptions primarily under conditions of strong sensory or emotional stimulation (Lange et al., 2000b, 2019; Evans et al., 2019). In practice, the preceding patterns suggest that high transliminals tend to facilitate or generate their altered or anomalous experiences, whereas low-to-average transliminals often require external catalysts for such effects.

Nell scored one standard deviation above the mean on the RTS, whereas Rod and Jill had slightly above-average scores (see **Table 3**). Consistent with the transliminal model (Laythe et al., 2018; Ventola et al., 2019), the family's RTS scores showed a moderate correlation [$r(13) = 0.36$, $p = 0.17$] with their respective SSE scores across Residences A–E. This suggests that the family's anomalous experiences are, in part, linked to high trait levels of Transliminality. Additionally, we discuss below how ongoing disruptions in the family's biopsychosocial environment likely bolstered their thin boundary functioning. Thus, both state and trait Transliminality are potential factors in this case.

Moreover, replicating prior research (Laythe et al., 2018, 2021a), **Table 3** clearly implicates Paranormal Belief in the family's anomalous experiences. Notably, each family member scored above-average on both the TPB and NAP varieties of PB, although TPB showed generally stronger levels and Nell was highest on both belief types. This implies that the entire family had strong foundational levels of Paranormal Belief that included both "internalized and externalized" supernatural forces but with an emphasis on external or autonomous agents. However, the family members' respective SSE scores across Residences A–E, correlated $r(13) = 0.47$, $p = 0.07$ with NAP and $r(13) = 0.02$ ($p = 0.94$) with TPB. This skew towards NAP is due to the daughter's patterns; the role of TPB becomes evident [$r(8) = 0.69$, $p = 0.03$] when scores for Nell and Rod are considered by themselves as the sole occupants of Residences A–E.

Feature 2: Dis-ease as a Catalyst for Anomalous Experiences

"Dis-ease" refers to a non-pathological alteration in waking experience, i.e., an individual's state of "ease" becomes notably imbalanced or disrupted. Studies suggest that anomalous experiences attributed to ghosts or poltergeists are often idioms of distress or broader dis-ease (e.g., Rogo, 1982; Houran et al., 2002a; Ventola et al., 2019). This pattern likewise applies to religious stigmata phenomena (Kechichian et al., 2018), and we should similarly note that Drinkwater and colleagues have found that percipients' interpretations of paranormal experiences are significantly mediated by their perceived anxiety (Drinkwater et al., 2013, 2017). However, dis-ease does not always entail "distress" (or negative emotions or stressors, e.g., abuse or injury, death of a family member, or financial problems) but also can mean "eustress" (or positive emotions or stressors, e.g., marriage, starting a new job, or buying a new home). Some stressors can be positive or negative depending on a host of factors, e.g., holiday seasons or the birth of a child. We refer readers to Ventola et al. (2019, pp. 146–157) for a discussion of these nuances in ghostly episodes.

Using Nell's retrospective log, which included all of her individual accounts of experiences across the five residences ($n = 267$ entries), there was a negative correlation [$r(265) = -0.25$, $p < 0.001$] between the number of Nell's anomalous experiences across her life periods and the general presence of eustress or distress, perhaps demonstrating a normalization of the phenomena by Nell over time (but see below). Yet, the presence of dis-ease did have a small and negative association [$r(265) = -0.22$, $p < 0.001$) with Nell's categories of *S/O* experience throughout her life, i.e., distress or eustress tended to coincide with subjective rather than objective phenomena. These findings largely undermine the idea of dis-ease as either a necessary or consistent catalyst in this case. However, a number of other patterns suggest that this variable had indeed played an active and important role here.

To begin, recall that the patterns in **Table 2** imply that dis-ease coincided with some of Nell's anomalous experiences as a Young Adult (around a third of the time) and then again as an Adult primarily at Residence A (where some source of stress was reportedly a prominent factor), and to lesser extent across Residences B–E. In these select instances ostensibly linked to dis-ease, the Young Adult period mostly referenced eustress, Residence A showed a balance of eustress and distress, whereas Residences B–E tended towards distress. That is, for some reason, Nell's anomalous experiences have become increasingly connected with the presence of distress.

Next, it is difficult to rectify some of Nell's questionnaire responses against her subsequent verbal reports. For example, Nell claimed to have "no notable stress, emotions, or situations" during Childhood (cf. **Table 2**), even though during later interviews she detailed a string of impressionable, if not influential, events that she experienced in relatively rapid succession at three years old. In fact, Nell reportedly remembers these quite vividly, i.e., (a) she witnessed along with her mother and grandparents a gruesome accidental death in May 1968 that was documented in the local newspaper, (b) the following June her grandfather died of natural causes, and (c) in July of the same year she turned four years old (i.e., a self-reported example of potential eustress). We suspected that events like this produced sustained dis-ease in Nell; an idea we sought to verify with the STCE measure (see section "Method," #7).

However, her STCE score of "8" was unremarkable and overall indicated a relatively low level of childhood trauma that in more extreme forms otherwise predict dissociation-schizotypy related phenomena (Irwin, 1992, 1996; Lawrence et al., 1995; Giesbrecht et al., 2007; Gibson et al., 2019). Of course, Nell's score

might also reflect impression management or even repression of unreported events. Dis-ease was reportedly associated with anomalous experiences during Young Adult (around a third of the time) and Residence A, where notable dis-ease was allegedly a prominent factor. Consistent with this interpretation, there was a small but positive correlation [$r(265) = 0.11$, $p = 0.40$] between the presence of dis-ease and the intensity of Nell's haunt-type perceptions (i.e., SSE item logits) across her life periods.

Finally, Nell's struggle with ongoing bouts of dis-ease featured prominently in her personal myth or illness narrative. During our visits and other interactions, she often talked about her life being constantly filled with distress from personal disappointments or medical challenges. This was such a frequent theme in her conversations with us that we asked her to list the most noteworthy examples. Clinical details are omitted here in the interest of confidentiality, but **Table 4** suggests that the most frequent dis-ease events (as judged most memorable by Nell) occurred during the periods of Childhood and Adult Post-Residence A. In about 17% of Nell's listed events, the dis-ease referenced perceptions that we know she deemed as "ghostly". But most often her distress represented biopsychosocial variables that apparently lacked a paranormal context (83% of the listed events). Taken altogether, the role of dis-ease in this case is reasonably confirmed albeit the actual prevalence or strength of its influence is unresolved.

Feature 3: Diverse *S/O* Anomalies With Temporal Patterns Suggesting Psychological Contagion

The HP-S model implies that encounter-prone individuals perceive a spectrum of *S/O* symptoms over time as opposed to having isolated occurrences or a limited range of perceptions (Houran et al., 2019b). This contradicts the idea that percipients merely perceive (or have experienced) a single anomaly, such as "sensing a presence," "hearing a physical knocking," or "seeing a ghost." Moreover, the HP-S concept contends that the detection of anomalous (or ambiguous) stimuli spreads within and across individuals similar to a contagious illness due to expectancy effects or Baader-Meinhof illusions. That is, transliminal perceptions can promote perceptual or confirmation biases as percipients search for additional evidence of their attributions, interpretations, or general beliefs. Several studies have correspondingly found temporal patterns in symptom perception that implicate psychological contagion or memetic-type processes in ghostly episodes (e.g., Houran and Lange, 1996; Lange and Houran, 2001a,b; Laythe et al., 2017; Drinkwater et al., 2019; Langston and Hubbard, 2019; Tashjian et al., 2022).

Consistent with expectations, this case contained a diverse set of *S/O* anomalies that were perceived over time. **Table 5** shows that 11 (or 69%) out of the family's set of 16 collective experiences across Residences A–E (including Residence F for daughter Jill) showed above-average "haunt intensity" (or perceptual depth) per Houran et al.'s (2019b) norms. Nell especially noted a wide array of encounter experiences throughout her life, starting with a haunted childhood home in which she had a frightening IC-type experience. Another striking event that occurred in her Adulthood (i.e., Spring of 2021) strongly paralleled reports of "alien abductions" (see e.g., Mack, 1994). Particularly, Nell went to bed fairly early (still daylight), dozed off, and suddenly felt as if she awoke to a dark room with soft lights in the walls. She was lying on a very cold, silver-colored metal table, with a bright white light shining on her. Nell was reportedly immobile apart from being able to move her eyes. Overhead she then saw a pencil-thin light about six inches from her face. The table would slide back-and-forth several times under this light while she laid there. She neither saw, heard, nor smelled anything or anyone, and the duration of the experience was unknown.

From 2011 to 2021 alone, Nell has perceived sensed presences, non-descript visual forms, alive-looking apparitions, mystical-type beings, and folklore-type beings. There was also an event at Residence A that was reminiscent of a MIB encounter, as well as aspects of newly recognized types of encounter experiences like "group- (or gang) stalking" (Lange et al., 2019; O'Keeffe et al., 2019). These patterns challenge the idea that encounter experiences constitute separate phenomena with different sources or mechanisms (e.g., Gauld and Cornell, 1979; Solfvin and Williams, 2021). Moreover, themes of negativity, threat, and persecution have dominated Nell's *S/O* experiences to the extent that she has often doubted her own sanity akin to self–imposed gaslighting (for discussions of related themes in encounter experiences, see Drinkwater et al., 2019; O'Keeffe et al., 2019; Lange et al., 2020).

Regarding the other aspect of Feature 3; however, a lack of data suitable for time series analyses made it infeasible to directly assess contagion or memetic processes affecting the family (see Houran and Lange, 1996; Lange and Houran, 2001a,b; Drinkwater et al., 2019). We can nonetheless still test some broad patterns that might indirectly suggest the influence of psychological contagion, namely whether the family has (i) SSE scores that increase sequentially across Residences A–E, (ii) positive correlations among their SSE scores (i.e., similar *perceptual depth* of haunt experiences), (iii) similar strength and direction of *successive variations* in their SSE scores across Residences A–E, and (iv) positive correlations among the SSE items that they specifically endorsed (i.e., *perceptual congruence* in their experiences).

The HP-S model recognizes psychological contagion as a measurable concept that presumably involves the instigation of successive (episodic) experiences due to expectancy effects on individuals or across a group of people. But we must underscore that in many cases, such as mass psychogenic illness (Sapkota, 2017), the exact mechanisms of contagion are not fully understood. As our study seeks to map the reported signs and symptoms in haunt-type episodes, it is notable that contagion (as a sharing or commonality of experiences or symptoms) is present not only across multiple residences, but between percipients. However, it is currently unclear the extent to which "congruence of experiences" derives purely from the influence of cuing or priming.

Analysis of **Table 5**'s underlying data found that the idea of contagion had mixed support per hypothesized patterns (i)–(iv) noted above. Pattern (i) was generally confirmed, although pattern (ii) instead showed opposite effects, i.e., Nell had a near zero correlation with Rod [$r(3) = 0.02$] but a moderately strong inverse correlation with Jill [$r(3) = -63$, $p = 0.26$],

TABLE 4 | Primary percipient's most noteworthy dis-ease events across life periods.

Childhood period
Nine-months old—Rubella (German Measles)
Cat scratch fever five times
Witnessed accidental death of an unknown woman
Death of her grandfather
Stepped on a rusty nail that went through foot, tetanus shot
Car accident car hit turning into driveway flew and hit head on driver window age 10
Fell out of tree house backwards age 10, nothing but breathless
Hit between eyes pitching at softball game
Racing mini-bike down alley and friend ran into me, thrown into fence
Hand slammed in car door
Right calf burned from brothers side pipes on car (left clovers pattern burn)
Age 12–24-year old brother slammed my face into car windshield
Teenage period
Age 13 serious elbow damaged from flying rock
Speed skating and caught right knee on brick entrance to the floor, knee puffed up
First panic attack at 14, in Minnesota at oldest brother's house, he slapped me in the face to try to make it stop
Young adult period
Age 20 got locked in elevator expecting Jill
Tumor size of grapefruit to right ovary, pain like knife to upper thigh, difficulty walking, miracle it disappeared. with ob gyn confirming most likely my daughters twin that never developed causing significant pain to thigh when trying to walk
Age 22 fell down a flight of stairs with heels on and fractured both feet
Age 25 came up from sitting and caught top of forehead on cabinet causing deep dent and cut
Age 32 fractured right foot again at robs mom house on front steps
Age 33 got shingles, but never had chicken pox
Adult-residence A period
Top of left hand cut at jenika's house from thing holding her arm throwing holy water that turned to blood
Started to get psoriasis on inner right ankle one area repeat from the stress
Car accident and hit head on left-side against window and hurt right shoulder, bruised
Hurt lower back again carrying jenika from car to house after knee surgery she had
Adult post-residence A period
Fractured right foot while trying to pack house on phoenix street
Aneurism in arm
Boxes falling on me for no reason, skin tears, bruises
Walking and hit by car in parking lot
Lacunar stroke from nine-day migraine
Busted interior of right knee on door jamb chasing my daughter, swollen up to size of small watermelon, took four months to recover
First time pneumonia from casino in eagle pass
Top of right hand split open
Hand slammed in door ×2
2nd degree burn to left breast from pot in sink that splashed by itself
Woke up to a bite mark to inner left thigh
Scratches to upper back
Awoke to find red ligature mark three-quarters around my neck
Chair fell backwards and landed exactly on left big toe at quick and nail, pain and dent and bruising, nail almost grown out, june of last year
Packing boxes in garage and things started falling on me. bruises cuts, knots
Again boxes falling and cut from boxes on arms and hands
Trouble coping with her daughter's sexual identity issues
Kicked out my daughter and grandchildren out of my house due to moral argument

Rod and Jill likewise showed a small negative correlation [$r(3) = -0.15$, $p = 0.81$]. Thus, the family tended to show *near-zero* to *opposite* congruence in their respective haunt intensities across the successive residences. But Nell and Jill's experiences certainly had a conspicuous connection that remains to be clarified. Next, pattern (iii) likewise tended to show opposite effects to expectations. Fluctuations in Nell's SSE scores across the five residences had a low to moderate negative correlation

TABLE 5 | Family members' SSE scores ("Haunt Intensity") across the successive residences.

	SSE: Residence A	**SSE:** Residence B	**SSE:** Residence C	**SSE:** Residence D	**SSE:** Residence E	**SSE:** Residence F
"Nell"/Mother (Primary experient)	55.3	60.7	51.0	59.6	60.7	*n/a*
"Rod"/Husband (Secondary experient)	54.3	48.6	49.8	49.8	54.3	*n/a*
"Jill"/Daughter (Secondary experient)	61.9*	57.5*	58.5*	49.8*	45.9*	59.6

**Visitations to these residences only.*

TABLE 6 | Endorsement of SSE items between residences and witnesses.

		Symptom and rarity spontaneous cond.			***Correspondence between houses***						***Between witnesses***			
		COMMON	***LOGIT***	***P***	***Res. 1***	***Res. 2***	***Res. 3***	***Res. 4***	***Res. 5***	***Ave.***	***Mother***	***Dad***	***Daught.***	***Ave.***
SSE15	1	Deja Vu	-1.65	**0.84**	0.33	0.33	0.00	0.00	0.33	**0.20**	0.60	0.00	0.00	**0.20**
SSE14	2	Sensed Presence	-1.59	**0.83**	0.33	0.00	0.00	0.33	0.00	**0.13**	0.20	0.00	0.17	**0.12**
SSE17	3	Unrecognizable Sound	-1.17	**0.76**	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	**1.00**	*1.00*	*1.00*	*1.00*	**1.00**
SSE20	4	Cold Area	-0.80	**0.69**	0.33	0.00	0.33	0.33	0.67	**0.33**	*0.20*	*0.80*	*0.17*	**0.39**
SSE29	5	Breeze	-0.73	**0.67**	*1.00*	*1.00*	*1.00*	*0.67*	*0.67*	**0.87**	*1.00*	*1.00*	*0.50*	**0.83**
SSE16	6	Recognizable Sound	-0.62	**0.65**	*0.67*	*0.67*	*0.67*	*0.33*	*0.33*	**0.53**	1.00	0.00	0.67	**0.56**
SSE25	7	Erratic Electronics	-0.62	**0.65**	*0.33*	*0.33*	*0.33*	*0.33*	*0.67*	**0.40**	1.00	0.20	0.00	**0.40**
SSE1	8	Non Descript Visual Form	-0.62	**0.65**	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	**1.00**	*1.00*	*1.00*	*1.00*	**1.00**
SSE7	9	Negative Feeling	-0.60	**0.65**	*0.67*	*0.67*	*0.33*	*1.00*	*0.67*	**0.67**	*0.80*	*0.80*	*0.33*	**0.64**
SSE31	10	Non Hostile Touch	-0.55	**0.63**	0.67	0.33	0.00	0.00	0.33	**0.27**	*0.60*	*0.00*	*0.33*	**0.31**
		LESS COMMON												
SSE3	11	Obvious Apparition	-0.51	**0.62**	*0.67*	*0.67*	*0.33*	*0.67*	*0.33*	**0.53**	*0.60*	*0.40*	*0.67*	**0.56**
SSE2	12	Alive Looking Apparition	-0.47	**0.62**	*0.67*	*0.33*	*0.67*	*0.33*	*0.67*	**0.53**	*0.60*	*0.40*	*0.67*	**0.56**
SSE8	13	Odd Body Sensations	-0.47	**0.62**	*0.33*	*0.67*	*0.33*	*0.33*	*0.33*	**0.40**	0.60	0.60	0.00	**0.40**
SSE22	14	Object Teleport	-0.10	**0.52**	0.00	0.00	0.33	0.00	0.00	**0.07**	0.00	0.00	0.17	**0.06**
SSE23	15	Object Movement	-0.05	**0.51**	0.00	0.33	0.00	0.00	0.00	**0.07**	0.20	0.00	0.00	**0.07**
SSE26	16	Recording of Image	-0.05	**0.51**	0.00	0.33	0.33	0.00	0.00	**0.13**	0.20	0.00	0.33	**0.18**
SSE13	17	Communication with X	0.03	**0.49**	0.33	0.00	0.00	0.00	0.00	**0.07**	0.00	0.20	0.00	**0.07**
SSE4	18	Pleasant Odor	0.04	**0.49**	*0.67*	*0.67*	*0.33*	*0.33*	*0.67*	**0.53**	0.60	0.00	1.00	**0.53**
SSE6	19	Positive Feeling	0.10	**0.48**	*1.00*	*0.67*	*0.67*	*0.33*	*0.67*	**0.67**	*1.00*	*0.40*	*0.67*	**0.69**
SSE19	20	Rec. of Unrecognizable Sound	0.16	**0.46**	*1.00*	*1.00*	*1.00*	*1.00*	*0.67*	**0.93**	*1.00*	*1.00*	*0.83*	**0.94**
SSE18	21	Rec. of Recognizable Sound	0.24	**0.44**	0.33	0.33	0.33	0.00	0.00	**0.20**	0.00	0.00	0.67	**0.22**
SSE5	22	Unpleasant Odor	0.42	**0.40**	*0.67*	*0.67*	*0.33*	*0.67*	*0.33*	**0.53**	0.00	0.60	1.00	**0.53**
SSE32	23	Threatening Touch	0.44	**0.39**	*0.67*	*0.67*	*0.67*	*0.33*	*0.33*	**0.53**	1.00	0.00	0.67	**0.56**
		RARE												
SSE28	24	Object Breakage	0.51	**0.38**	*1.00*	*1.00*	*1.00*	*1.00*	*1.00*	**1.00**	*1.00*	*1.00*	*1.00*	**1.00**
SSE24	25	Object Levitation	0.65	**0.34**	*0.67*	*0.33*	*0.33*	*1.00*	*0.67*	**0.60**	*0.20*	*0.80*	*0.83*	**0.61**
SSE21	26	Hot area	0.72	**0.33**	*0.33*	*0.67*	*0.33*	*0.33*	*0.33*	**0.40**	0.60	0.00	0.67	**0.42**
SSE10	27	Possession	0.84	**0.30**	*1.00*	*1.00*	*0.67*	*0.67*	*0.67*	**0.80**	*1.00*	*0.60*	*0.67*	**0.76**
SSE27	28	Plumbing Malfunctions	0.90	**0.29**	0.00	0.00	0.00	0.00	0.00	**0.00**	0.00	0.00	0.17	**0.06**
SSE11	29	Mythical Type Beings	1.07	**0.26**	*0.67*	*0.67*	*0.67*	*0.67*	*1.00*	**0.73**	*1.00*	*0.20*	*1.00*	**0.73**
SSE9	30	Taste	1.08	**0.25**	0.33	0.00	0.00	0.00	0.00	**0.07**	0.00	0.00	0.17	**0.06**
SSE12	31	Folklore Type Beings	1.61	**0.17**	0.33	0.00	0.00	0.33	0.00	**0.13**	0.20	0.20	0.00	**0.13**
SSE30	32	Fires	1.71	**0.15**	0.00	0.00	0.00	0.00	0.33	**0.07**	0.00	0.20	0.17	**0.12**

Bolded figures indicate raw probabilities of occurrence, and underlined figures denote high rates of phenomena consistent across residences.

with Rod's SSE fluctuations [$r(2) = -0.36$, $p = 0.63$] and an even stronger negative correlation with Jill's SSE fluctuations [$r(2) = -0.96$, $p = 0.04$]. However, the variability of Rod and Jill's SSE scores across the successive residences were positively correlated [$r(2) = 0.17$, $p = 0.82$].

While SSE scores varied across the percipients, **Table 6** supports hypothesized pattern (iv) by clearly highlighting 12 separate SSE items that were both experienced by all percipients and across all five residences (See **Table 6**, italics). These items included four commonly-witnessed phenomena (i.e., "cold area,

breeze, non-descript visual forms, and negative feelings"), four less common items (i.e., "obvious apparition, alive looking apparition, positive feelings, and recordings of unrecognizable sounds"), and four rarely-endorsed items (i.e., "object breakage, object levitation, partial or full possession, and seeing mythical-type beings"). Thus, approximately 37.5% of potential SSE items were consistently perceived both across multiple locations and between all experients in this case.

The putative contagion pattern that emerges from **Tables 5**, **6** is complex. On the one hand, Nell showed a general increase in the number of encounter experiences over her life, and she and Rod both had broad but slight increases in perceived haunt intensities across the sequential residences. These trends are arguably consistent with contagion at the experient level. However, the family had negative to near-zero correlations among the perceptual *depth* and *contents* of their experiences across the sequential residences, and the daughter's SSE scores generally decreased over time. However, other qualitative information suggests that contagion or memetic effects were involved but primarily confined to individual family members.

Similar to studies showing cuing–priming effects in paranormal contexts (Houran and Lange, 1996; Laythe et al., 2017; Houran et al., 2020), Nell and Jill both independently reported a flurry of *S/O* experiences during the two-week time period preceding our in-person visits. Specifically, Nell claimed that their computers would "act up" when they attempted to email us information. She remarked that, "Believe it or not this stuff happens when trying to send photos or videos pertaining to this nightmare." Nell would also occasionally report that "things are increasing," "new types of things are happening," and "this thing is really putting up a fight." The daughter similarly reported increased sleep disturbances, sensed presences, and inexplicable sounds at her own home (Residence F).

Despite a lack of temporal sync between the occurrence of events, Nell and Jill's inverse relationship suggests that one or the other, at a specific time, was more likely to report anomalous experiences. **Table 6** further implies that specific *S/O* perceptions were contagious, albeit not necessarily at the same time for each percipient. It is evident that, if we examine these anomalous experiences solely from a contagion perspective, reporting of one particular feature of the SSE by a family member was followed by others also reporting it. The combined findings from **Tables 5**, **6** arguably suggest the presence of contagion–memetic processes in this case, although the timing of these perceptions seemed to vary as a function of the interpersonal relationships between Nell, Rod, and Jill.

Feature 4: Attributions for *S/O* Anomalies Align to Percipients' Biopsychosocial Environment

Quali-quantitative observations affirmed this recognition pattern. **Table 2** showed that PB was a strong and ready variable to contextualize the family's apparent transliminal experiences. Particularly, both Nell and Rod showed above-average levels of PB, although they scored consistently higher on TPB than NAP. It would be expected therefore that they would interpret their anomalous experiences in terms of *external* agency, such as dogmatic, religious-oriented concepts or forces. This was confirmed during our in-person visits whereby each room in Nell's house was found to be heavily decorated with different forms of Christian iconography. She also reported experiencing "positive" meaningful coincidences (e.g., repeatedly seeing the number "22" in everyday situations) that she interpreted as the presence or influence of "angels." This religiosity carried over from her childhood and young adulthood, where she felt like a "martyr" due to the many sacrifices or burdens she endured for others. In short, Nell construed the prevalence of dis-ease in her life as directly linked to the conviction of her religious faith.

It thus made sense that Nell and Rod attributed the *S/O* phenomena to a "a malicious entity that is trying to terrorize her [Nell] because she is so religious." In fact, Nell specifically identified the persecutory spirit as "Beelzebub"—a name used by some Abrahamic religions for a major demon or even Satan. More to this point, Nell stated that one tactic that would often would temporarily halt her anomalous experiences would be to play the "Pie Jesu Domine" dona eis (est) requiem by vocalist Charlotte Church. Later in the paper we discuss at length more evidence supporting Feature 4, as Nell's strong TPB hindered our intervention strategy for the family (see "Clinical Complications During the Investigation"). Conversely, Jill's higher NAP versus TPB score suggests a stronger belief or influence of *internal* agency, such as one's own "psychic" ability. This agreed with Jill's self-description as "an extremely protective mother of her children in the face of the paranormal activity." She accordingly considered herself strong or empowered enough to manage whatever was causing her anomalous experiences.

Feature 5: Percipients' Anxiety Levels Are Related to the Nature, Proximity, and Spontaneity of *S/O* Anomalies

Threat (and agency) detection (Freeman et al., 2002; Gaynor et al., 2013; Brett et al., 2014; Jelić and Fich, 2018; Coelho et al., 2021; Tashjian et al., 2022)—or Hypersensitive Agency Detection Device (HADD, see e.g., Barrett, 2000, 2004; Atran, 2002; Guthrie, 2013)—likely influences HP-S in several ways that we have discussed previously (Drinkwater et al., 2021; Laythe et al., 2021a). First, anomalies might be judged as more or less frightening depending on their degree of *spontaneity*. Increasingly anxious or fearful reactions are likely when anomalous perceptions occur unexpectedly. An accompanying decline in overall mental health might also occur with individuals who have a strong "need for control" (Langer and Rodin, 1976; Leotti et al., 2010). That said, other studies suggest that a low "desirability for control" is associated with poorer reactions (Burger and Cooper, 1979).

Next, there is the degree to which percipients interpret specific *S/O* anomalies as inherently threatening due to their *nature*, e.g., the more physical the events, the more dangerous they might seem. Finally, we expect that the more *proximal* the anomalies are to one's personal space, the more intense or prevalent the corresponding interpretations of anxiety, fear, threat, or persecution. Personal space is the region surrounding

TABLE 7 | Primary percipient's anxiety–fear levels during anomalous experiences correlated to situational factors.

Contextual factors	Anxiety-fear level (Spearman *rho*)
Dis-ease (distress or eustress)	0.10
Proximity (1 = inside, 2 = outside personal space)	−0.15
Setting (alone = 1, others = 2)	−0.26
***S/O* event type** (*S* = 1, *O* = 2)	−0.26
***S/O* logit value** (Rasch scaled intensities of specific events: Houran et al., 2019b)	0.16

individuals that they regard as their psychological territory and physical domain. Most people value their personal space and feel discomfort, anger, or anxiety when this space is encroached (Welsch et al., 2019). Thin boundary functioning is further expected to facilitate threat (agency) detection in that Transliminality arguably supports predictive coding (Evans et al., 2019), which Anderson (2019) has argued can effectively account for HADD-related behavior.

Given her strong level of TPB, Nell profiled unsurprisingly as having a low desirability for control (cf. **Table 3**). These trends clearly align to a personal ideology that emphasizes an *external* locus of control regarding life events. The anxiety–fear levels coinciding with Nell's anomalous experiences were only somewhat acerbated by ongoing or precursor stress as suggested by a very low but significant Spearman correlation [$rho(265) = 0.10$ $p = 0.03$] between Nell's anxiety–fear levels and concurrent dis-ease in her life. Further, her anxiety-fear levels showed a similar relationship [$rho(265) = 0.16$, $p = 0.003$] in accordance with the intensity of specific *S/O* anomalies (measured by their Rasch logit values, cf. Houran et al., 2019b, p. 173). In other words, the more "intense" the anomalous events were in a psychometric sense, the more anxiety-fear Nell tended to experience. **Table 7** further shows that anxiety–fear levels have small but consistent relationships with anomalies that occurred (a) inside her personal space, (b) when she was alone, and (c) involved *subjective* (psychological) experiences versus *objective* (physical) events (cf. **Table 2**).

CLINICAL COMPLICATIONS DURING THE INVESTIGATION

Case studies of presumed HP-S ideally include interventions to help individuals understand and cope with their anomalous experiences, starting with the educational task of normalizing these occurrences for percipients. Laythe et al. (2021a) further discussed a range of approaches to ameliorate the (a) frequency or intensity of experients' symptom perception, and/or (b) anxieties related to the anomalous or threatening nature of the *S/O* phenomena. Other authorities have also offered useful guidance to clinical practitioners (Hastings, 1983; Targ and Hastings, 1987; Coly and McMahon, 1993; Chadwick et al., 1996; Brett et al., 2007; Murray, 2012; Alton, 2020; Webb, 2021). We emphasize that social desirability biases can be major confounds when assessing and addressing potential HP-S. Based on our dealings with Nell's family in this respect, we recommend that researchers or clinicians not administer screening inventories or psychological assessments prior to establishing strong rapport with the percipients to safeguard against impression management (see Roxburgh and Evenden, 2016a,b; Drinkwater et al., 2019). Further, questionnaires that address controversial beliefs or experiences might be better administered via empathetic, in-person interviews rather than standard administrative methods that could cause individuals to feel judged on their mental acuity.

Nell also responded enthusiastically to the attention shown to her during our investigation. This spotlight might have met psychological needs that were otherwise unsatisfied within her family dynamic. But she also wanted from us an outright validation of her interpretation for the anomalous events, which prompted her to resist our explanations and related options for relief. Specifically, we assigned Jill and Nell visualization exercises that emphasized "protection" in combination with "mindfulness" meditations. These exercises were rooted within a religious ideological framework to which the family could relate, in the hopes of reducing emotional stimulation that fueled the family dynamic and ostensibly fostered both transliminality and Nell's histrionic or catastrophizing reactions to the anomalous experiences generated by the transliminality. Note that this approach paralleled Jalal's (2016) use of focused-attention meditation combined with muscle relaxation therapy to relieve fits of sleep paralysis, which is an experience of immobility that often includes terrifying hypnogogic or hypnopompic hallucinations with paranormal undertones (cf. Hufford, 2001).

The tactic reportedly provided appreciable relief in the short-term, but the family regarded the exercises as too tedious to sustain. We next recommended that Nell explore "Eye Movement Desensitization Reprocessing" (EMDR; for an overview, see Castelnuovo et al., 2019). This evidence-based psychotherapy draws on the Adaptive Information Processing model that posits much of psychopathology is due to the maladaptive encoding or incomplete processing of traumatic or disturbing adverse life experiences (Hase et al., 2017). EMDR has shown corresponding efficacy for psychiatric and somatic disorders with comorbid psychological trauma (Valiente-Gómez et al., 2017), and, thus, it might also be effective for aspects of HP-S.

We think that our recommendations eventually failed for two reasons. On one hand, Nell sought a quick remedy to their situation. On the other hand, and consistent with gaslighting effects in haunt accounts (Drinkwater et al., 2019), Nell strongly resisted any interpretation that differed with her belief that evil spirits were the primary source of the *S/O* anomalies. In fact, Nell's reactions to our conclusions in this case strongly paralleled the behaviors of naïve research subjects who observe staged "paranormal" demonstrations. For instance, participants sometimes remember witnessing manifestations (even physical events like object displacements) that actually never happened (Wiseman et al., 2003). Moreover, proponents of psychic phenomena tend to rate such staged demonstrations as more paranormal than disbelievers, and these beliefs often persist even *after* debriefing (French, 1992; Hergovich, 2004; Smith, 1992/1993; Wiseman and Morris, 1995). Apparently for some

people, the paranormal is the preferred explanation even when such beliefs conflict with the available evidence (for a discussion, see Houran and Lange, 2004).

Nell was careful not to completely dismiss our conclusions and recommendations, but she quickly pushed for a consultation with a spiritual medium to validate her stance on the anomalous experiences. This shift appeared to us as a form of "doctor shopping (or hopping)," which involves patients who seek multiple clinicians or second opinions (Sansone and Sansone, 2012; Velma et al., 2014; Lane, 2020) often as a way "to interpret, regulate, and mediate various forms of self-understanding and activity" (Brinkmann, 2017, p. 170). This behavior can be particularly aggravated when an individual is dealing with medically unexplained symptoms (de Zwaan and Müller, 2006). She eventually contacted a local psychic and Reiki practitioner, who concluded that her family was probably cursed in some way. Nell understandably seized on this agreeable opinion as it fit with her TPBs and explicitly confirmed her conviction that an external, malevolent agent was responsible for the family's haunting.

Research shows that metaphysical—or spiritistic—oriented interventions sometimes alleviate haunt-type experiences (Roll, 1977; Lucchetti et al., 2011; Storm and Tilley, 2020). Rather than proving the reality of the paranormal, of course, successful outcomes in this respect can be explained as psychodramas, demand characteristics, or placebo effects (for discussions, see Storm and Tilley, 2021; Laythe et al., 2022). Only time will tell whether a "psychic intercession" benefits Nell's family. However, our prognosis is not optimistic. Two previous house blessings by Catholic priests reportedly failed to stop the *S/O* anomalies. This seemingly contradicts her high TPB, but expectancy effects from these rituals were perhaps nullified by strong criticisms and resentments towards the Catholic church that Nell voiced to us. Symptom relief appears further unlikely without a stabilized family dynamic, especially as related to Nell's attention-seeking behavior that might hint at a broader martyr or victim complex—or perhaps even covert narcissism (i.e., narcissistic personality disorder)—meant to elicit sympathy, love, admiration, loyalty, or even guilt from her family and broader social support network. We do not assert here that mental illness explains this case; only that our observations lead us to suspect that some type of condition or temperament issue has moderated her reactions to the anomalous experiences. For more information on clinical theory and practice in this context, we refer readers to Rabeyron's (2022) detailed overview, discussion, and recommendations.

DISCUSSION

Key aspects of the San Antonio Disturbances generally fit the five proposed recognition patterns of HP-S. That is, quali-quantitative analyses affirmed several predictions from Laythe et al. (2021a, 2022) about the features and dynamics of ghostly episodes which manifest spontaneously and recurrently to certain people. The strongest alignment to the HP-S model was the associations between the family's anomalous experiences and their elevated levels of Transliminality (*sensitivity*) and Paranormal Belief (*ideology*). This agrees with the interactionist view that bridges the Experiential Source versus Cultural Learning views of anomalous experience (for discussions, see Laythe et al., 2018; Lange et al., 2019). Indeed, growing evidence suggests that ghostly episodes like the present case involve mutually-reinforcing contributions from both unusual perceptions and the cognitive frameworks that percipients use for meaning-making (Houran et al., 2002b; Wiseman et al., 2002; French et al., 2009; Langston and Hubbard, 2019).

The anxiety or fear reported by the primary percipient showed patterns that broadly align to principles of threat (and agency) detection. But this does not mean there is nothing to learn in this area and as applied specifically to religious- or supernatural-oriented contexts. For instance, recent work (Tashjian et al., 2022) demonstrates the relevance of (a) social dynamics (friends vs. strangers) for *tonic arousal* (i.e., intrinsic arousal that fluctuates on the order of minutes to hours.) and (b) subjective fear and threat predictability for *phasic arousal* (i.e., a respondent state of vigilance increment of short endurance and dependent upon the stimulus conditions of novelty and others). People's demographic characteristics can further influence their fears of particular supernatural topics (Silva and Woody, 2022).

A related issue concerns the main sources of fear and anxiety with *S/O* anomalies. For instance, Naij and van Elk (2017) talked about the difference between "prior expectations" formed by interaction with the environment (e.g., instruction, cultural transmission, learning, and reliance on source credibility) and "evolved priors" that were presumably selected by a process of natural selection. We should emphasize that fear is not the only possible response to ghostly episodes. Often, percipients also reference a sense of "enchantment" that disrupts normal waking experience with a sudden, unexpected, or profound awareness that ultimately culminates in a transformative feeling of connection to a "transcendent agency or ultimate reality" (Holloway, 2010; Drinkwater et al., 2022; Houran et al., 2022). The interplay among all these dynamics should be explored in-depth, as they may mediate contagion effects.

Now the roles of dis-ease and psychological contagion as the instigators or facilitators of the anomalous experiences in the present case received mixed support. These possible inconsistencies might derive from imprecise or incomplete data or insufficient methodologies applied to such data. Accordingly, future research should explore several alternative explanations. Particularly, it might be that the presumed features of HP-S (a) are neither simultaneously involved, nor all required in the process; (b) do not necessarily constitute the same process in every case; or (c) are not completely defined in their components or mechanisms. This latter issue might particularly pertain to psychological contagion, given that we observed decent-sized effects but typically skewing opposite to predictions. This could suggest that the underlying mechanisms and subsequent effects of psychological contagion, or cuing in general, are more complex or nuanced than currently understood.

Nevertheless, we can characterize Nell's encounter experiences as: (a) mostly prevalent in adulthood, (b) manifesting both inside and outside her personal space, (c) involving a mixture of *S/O* anomalies, with a recent flood of *O* events from the use of audio-video technology she has used to document perceived

anomalies, (d) inducing moderate levels of anxiety or fear, (e) often occurring in the presence of others with similar belief structures, and (f) ensuing within a context of strong and distressing family dynamics that have been normalized and unaddressed in a clinical sense. Considering all the information and evidence available to us, we conclude that this case represents the symptoms and manifestations of thin (permeable) mental boundary functioning in the face of unfavorable circumstances or overstimulating environments and subsequently acerbated by poor emotion regulation, histrionic or catastrophizing reactions, and active confirmation biases.

This study has several important limitations. First, our inferences and conclusions were based on limited data that likely produced statistically non-significant outcomes in some instances. Therefore, replications are critically needed to affirm our findings and their implications. This includes the use of large datasets and corrections for multiple observations as opposed to our more liberal case study approach. Second, we cannot cross–check the veracity of the information in this case. Confounds can arise with naturally "noisy" data, including latency effects with retrospective accounts, as well as omissions, embellishments, or fabrications of some or all the salient details. Indeed, impression management, at least on Nell's part, was undoubtedly a constraining factor at times. Despite these potential shortcomings, we contend that our findings cannot be fairly dismissed as artifacts of overly cursory or exploratory analyses or overreaching interpretations. Indeed, hypothesis-testing with quantitative methods identified patterns that often were consistent with theory-driven predictions.

Moreover, these same outcomes are probably not as small or subtle as the statistics might suggest. Readers should be mindful that attenuated coefficients are artificially weakened by the unreliability inherent to all psychometric measures. Therefore, the true effect sizes related to the five recognition patterns found here are likely to be much larger than they appear (for discussions, see e.g., Jensen, 1998; Lange et al., 2019). That said, we were not experimentally blind to the hypotheses when collecting and interpreting the data in this case. As a result, we could be criticized for not fully controlling for experimenter biases that possibly influenced our approaches or conclusions (Holman et al., 2015). Pre-registered studies by independent researchers guided by our framework and methodologies should help to address this concern.

Third, several other pertinent psychometric measures could have been administered to further refine our understanding of witness psychology in paranormal contexts, such as *ambiguity tolerance* (Lange and Houran, 2001a), *aberrant salience* (Irwin et al., 2014), *idiopathic environmental intolerance* (Witthöft et al., 2008), *schizotypal tendencies* (Cicero et al., 2021), and particularly in this case, the variables of *allostatic load* (i.e., the cumulative burden of chronic stress and life events, Guidi et al., 2021) and *negative urgency* (i.e., the tendency to act rashly when distressed, Settles et al., 2012; see also Joyner et al., 2021). Percipients' receptivity to *psychological contagion* might also be explored deeper with measures such as the Gudjonsson (1984) Suggestibility Scale or the Absorption Scale to gauge a person's tendency to become immersed within sensory experiences (Tellegen and Atkinson, 1974). Beyond modeling the predictors or mediators of HP-S related perceptions and reactions, this line of research might be particularly useful for identifying effective treatment options for experients. Here is where qualitative methods might serve as a valuable augment to gain richer knowledge about how percipients construct meaning from their experiences and likewise how experiences affect individuals (cf. "HP-S Feature 4: Attributions for *S/O* Anomalies Align to Percipients' Biopsychosocial Environment").

Lastly, our study considered only the psychosocial aspects of the family's anomalous experiences versus their potentially parapsychological nature. Some researchers reject this latter line of inquiry (e.g., Nickell, 2001; Reber and Alcock, 2020), while others embrace it (e.g., Roll, 2003; Maher, 2015). Blanket dismissals of this controversial viewpoint in terms of fraud, hype, noise, or confusion are arguably simplistic, misguided, and counterproductive to ongoing model–building and theory–formation in consciousness studies. Indeed, we would be remiss not to mention that transliminality positively correlates with several indicators of putative psi (Thalbourne and Houran, 2003; Thalbourne and Storm, 2012; Ventola et al., 2019). Furthermore, we obtained some unusual environmental readings during the present investigation that will be explored in separate research (cf. Laythe and Houran, 2018; Dagnall et al., 2020; Laythe et al., 2021c). And finally, different processes likely underlie the occurrence of anomalous experiences versus the attributions used to describe or explain them (Ross et al., 2017). Thus, poorer cognitive functioning or mental wellness can sometimes be a reaction or consequence of having anomalous or altered experiences versus the precursor or cause (Inglis and Storm, 2021).

That said, the HP-S model neither requires nor negates the ontological reality of parapsychological mechanisms. Our collective research instead suggests—irrespective of potential psi—that spontaneous ghostly episodes like the San Antonio Disturbances are a pronounced psychological phenomenon at the crossroads of belief- and boundary- structures and reflective of dis-ease states or circumstances (Laythe et al., 2021a, 2022). We thus encourage scientists across all disciplines to take haunt and poltergeist reports seriously and to explore their "blue ocean" of data using fresh and impartial perspectives. Studying these percipients and their biopsychosocial environments should help to clarify processes for coping and meaning-making relative to the complex issue of spirituality in mental health (O'Reilly, 2004; Johnson and Friedman, 2008; Koenig, 2012) and the associated continuum in the general population along which normal and extraordinary forms of perception and cognition may be mapped (Persinger and Makarec, 1993; Claridge, 1997; Evans et al., 2019).

DATA AVAILABILITY STATEMENT

The non-confidential raw data and supplementary materials related to this study are on file at ISRAE and available to qualified researchers, https://www.israenet.org/. The other raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

ETHICS STATEMENT

The studies involving human participants were reviewed and approved by Ethics Committee, Institute for the Study of Religious and Anomalous Experience. The patients/participants provided their written informed consent to participate in this study.

AUTHOR CONTRIBUTIONS

JH: conceptualization, project administration, investigation, formal analysis, and writing—original draft preparation, review, and editing. BL: conceptualization, investigation, formal analysis, and data curation. Both authors read and approved the final manuscript.

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Praying for a Miracle Part II: Idiosyncrasies of Spirituality and Its Relations With Religious Expressions in Health

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As a continuation of the previous paper, *Praying for a Miracle – Negative or Positive Impacts on Health Care*, published in this research topic, this second paper aims at delving deeper into the same theme, but now from a simultaneously practical and conceptual approach. With that in mind, we revisit three theoretical models based on evidence, through which we can understand the role of a miracle in hospital settings and assess its impact in health contexts. For each of the models described, we seek to illustrate the possible outcomes of belief in miracles as a modality of religious coping in situations of stress and suffering experienced by patients and caregivers in the face of gloomy diagnoses on coming across the limits of medicine to revert certain illnesses (e.g., child cancer) or biological conditions (e.g., fetal malformation). We posit that the judgment about how such a mechanism is healthy or not for each of the people involved (patient, caregiver, and/or health professional) depends on the modulation between the conception of the miracle adopted by the patient and/or caregiver and the concrete outcomes of the way of responding to the situations that accompany the gravity of the illness or condition. To better understand this process of psychological modulation that accompanies belief in miracles, we revisit the concepts of spirituality, religiosity, and religion, pointing out the connections and distinctions between them from a phenomenological perspective. We then present a conceptual model that takes these connections and distinctions into consideration to foster an understanding of miracles, their relations with the diversity of experiences of people who meet in hospital settings (patients, caregivers, and health professionals), and their respective impacts on healthcare.

Keywords: miracle belief, spirituality, religiosity, religion, psychology of religion, religious coping

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INTRODUCTION

The theme of miracle, scarcely, or rarely discussed in the scientific circle of medicine and psychology, is significantly constant in daily hospital experience (Ellington et al., 2017; Saad and Medeiros, 2018; Shinall et al., 2018; Bibler et al., 2020; Gradick et al., 2020), especially in situations that involve diagnoses, for which there are no hopes for a cure by the medical team. Even though the belief or hope in miracle is

not a privilege of only the patient and caregivers, and may also be nurtured by health professionals—especially in countries with a high religious population like Brazil, for example, studies have pointed out strong resistance, enormous difficulties or, in the least, some discomfort in handling the question by members of the medical team (Green, 2015; Rossel et al., 2016; Ellington et al., 2017; Freitas et al., 2017). Even though many professionals frequently attribute such reactions to the supposedly (de)negating component of miracles, which would hinder the confrontation of the reality associated with the gloomy diagnoses (Carlsson et al., 2017; Borges and Petean, 2018) and would induce wishful thinking (Vasconcelos and Petean, 2009), the question is much more complex.

As demonstrated in another paper of this same research topic - *Praying for a Miracle, Part I* (Leal et al., 2022), the simplistic perspective of the notion of a miracle may pave the way to understanding it as an extraordinary event not applicable to the laws of nature, and, consequently, to the interpretation that the hope (by patients and caregivers) of its occurrence would necessarily imply the refusal of recognizing and assuming the gravity of the organic conditions resulting from illnesses, traumas, accidents or whatever concrete limitations scientifically diagnosed by medicine. Nevertheless, such a reductionist conception, much common among medical team members; sometimes reinforced by psychological theories that created the stereotype that religiosity and religion are coping strategies focused only on emotion (Pargament et al., 2005), on phantasmagoric illusion (Ghsymala-Moszcynska and Beit-Halahmi, 1996), or alienation from reality (Chagas, 2017), maybe a disguise that absconds graver problems. As such, from workplace mental health and the psychodynamic point of view, the conceptual reductionism of the notion of miracle and the elements that sustain it can be interpreted as symptoms of a kind of defensive ideology, in the sense defined by Dejours (2018), shielding medical team members from direct contact with their existential dilemmas, as well as their impact on medical practice, and/or with situations that might be out of their objective control. From the practical point of view, it could be an exposure to a lack of scientific (or even theological) knowledge by a great majority of health professionals about the role of spirituality and religiosity on physical and mental health (Koenig, 2012; Filho et al., 2021). This often aggravates the insufficiency of relational and sociocultural competencies (Whytley, 2012; Swihart et al., 2021) in handling overwhelming questions that are beyond the objective limits of medicine, such as those associated with the finitude of life and its mysteries, for example.

In light of the above, there arises the necessity of a deeper discussion of this question in scientific settings and in an interdisciplinary perspective, where the psychology of religion, in dialogue with other fields like theology, medicine, and philosophy, can contribute to a better understanding of the psychological aspects involved in the belief in miracles and its impacts on physical and mental health, either for patients, caregivers or for health professionals themselves. This paper, therefore, in conjunction with the aforementioned study by Leal et al. (2022), aims at contributing to this end. The first study focused on the problematization of the dichotomy around the positive or negative role of the belief or hope in miracles, and presented a critique grounded on a phenomenological perspective, pointing out the risks of a conception that hastily judges them as harmful to patients' (or caregivers') physical or mental health – and as such, tags them as negative spiritual/religious coping (NSRC) strategy. This second study, *Praying for a Miracle – Part II*, in its turn, aims at deepening the subject from an approach that is simultaneously practical and conceptual. Therefore, three models based on evidence already presented in the previous paper (Leal et al., 2022) will be explored here from a phenomenological perspective and, posteriorly, placed in dialogue with the concepts of spirituality, religiosity, and religion. It is assumed that such a perspective provides an axiological and epistemic grounding capable of offering a theoretic-conceptual underpinning that would permit health professionals, including the psychologist, to situate the experience of believing in a miracle in a complex network of meanings, symbolisms, and existential meanings, and understand its relations with the human dimensions of spirituality, religiosity and religion, and the respective connections between them. The starting point is the principle that such an understanding, besides fostering a constant exercise of auto reflexivity by professionals, will offer subsidies that enhance a more sensitive and adequate clinical management of the various ways, through which belief in miracles is effectively manifested in hospital settings.

To achieve these objectives, this paper is laid out in the following manner: after this short introduction, we present three models based on the evidence currently proposed for understanding the role of miracle, derived from the effort to understand its idiosyncrasies in specific contexts, including those involving children in grievous states and their family members. We, then, discuss from the historical and epistemological point of view, the connections and distinctions between spirituality, religiosity, and religion, presenting a conceptual model based on phenomenology. From this model, we seek to understand the modalities and possible outcomes of belief in miracles (as an expression of spirituality, religiosity, and/or religion) in hospital settings, and discuss the outcomes for clinical handling in concrete situations of healthcare.

PROPOSED MODELS FOR UNDERSTANDING THE ROLE OF MIRACLES IN HEALTH SETTINGS

One of the models already proposed for understanding belief in miracles in health contexts is directly derived from the conception of spiritual/religious coping (SRC) elaborated by Pargament and his collaborators (Pargament and Hahn, 1986; Pargament, 1990; Pargament et al., 1990). As pointed out in the previous paper by Leal et al. (2022), such a model, contributes to a pragmatic approach to the subject, promoting studies of nomothetic nature in the field of psychology of religion and investigating SRC on large scales, led to a dichotomous classification of miracle into positive and negative. This is well illustrated, for example, in the elaboration of the North American SRC scale (called RCOPE), created by

Pargament et al. (2000), and later, translated and adapted to Brazil by Panzini and Bandeira (2005). In this instrument, SCR was divided into eight factors characterized as positive (PSRC) and four factors characterized as negative (NSRC). Even though in this instrument, the act of praying for a miracle was classified into the group of negative factors, in the analysis of Leal et al. (2022), this was due to a reductionist conception of the act in question, classifying it as a coping strategy focused on emotion and characterizing a passive religious delegation or negative prayer for tending to modify divine will. It is worth mentioning that even from a cognitivist perspective, Pargament himself and some of his collaborators, in more recent works (e.g., Pargament and Exline, 2022), have used a less dichotomous terminology to refer to SRC, for example using the expression "religious/spiritual struggles" instead of the notion of NSRC.

From a phenomenological point of view, we can understand that the cognitive model developed by Pargament and collaborators (Pargament and Hahn, 1986; Pargament, 1990, 1997; Pargament et al., 1990), if understood from a more qualitative perspective and less committed to a classificatory and dichotomous concern, allows for an evaluation of the psychological function of the belief in miracles, which is also understood from a broader phenomenological conception and not merely reductionist, about each one of the factors mentioned in the scale. For a better understanding of the exposition made above, we make in a concise form an application of this model in the evaluation of the act of praying for a miracle, considering each of the factors, positive and negative, mentioned in the scale (called RCOPE).

The seven factors originally classified as positive in the scale elaborated by Pargament et al. (2000) were transformed into eight in the version translated and validated to Portuguese by Panzini (2004). They are as follows: (1) Transformation of self and/or of life, by which it could be evaluated how belief in miracles can bring about or not, a personal transformation, either in the form of an internal and/or external modification of life; (2) Actions in search of spiritual help to aid in assessing the role of hope in miracle in the move of seeking in the other (individual, institutional, family, or social) a kind of spiritual help, e.g., spiritual treatment, orientation from spiritual entities, reposition of vital energy, and practice of activities in search of spirituality or more connection with it; (3) Offer of help to others, by which to identify how belief in miracles can foster behaviors of helping the other (individual, institutional, family, or social), either through prayers, support and/or spiritual orientation, donations, voluntary work, and/or affective-cognitive internal modifications for the benefit of others; (4) A positive stance before God, a factor that permits the assessment of how the behavior of praying for a miracle reveals or not a personal attitude before God about the situation, manifests either through religion, a search for support in God, or more connection with Him and/or of positive evaluations through Him and manifest in such attitudes, as collaborating, praying, approaching, counting on and/or depending on God, or individual actions independent of God's help; (5) A personal search for spiritual growth, by which to assess show much hope in miracles reveals a personal search for God and/or of spirituality (in contrast to institutional search), or a search for self through God and/or of spirituality, capable of being manifest, for example, through positive reassessments, non-institutional practices, search for deep connection with self or with forces that transcend the individual; (6) Actions in search of the institutional other, that can reflect how much the belief in miracles enhances the move of approaching religious institutions, places, members or religious representatives, or other manifestations that might result in support and institutional belonging; (7) A personal search for spiritual knowledge, through which to judge how much belief in miracles enhances more religious-spiritual knowledge, with the aim of, for example, internal self-strengthening in confronting the world and/or divine plans, increasing religious practice, or developing new attitudes in life; seeking help to cope and/or understand the situation, resulting in intellectual growth, among others; and (8) Estrangement through God, religion, and/or spirituality, a factor through which to distinguish how belief in miracles promotes a change of personal perspective about the situation, in which a person distances him or herself from the problem and respective stressful condition to approach God and/or religious/spiritual questions, without necessarily characterizing mere avoidance, but only a temporary distancing and capable of permitting him or she oxygenizes the mind, on focusing attention on another subject, specifically, on spiritual and religious aspects.

The four negative factors mentioned in the same scale (Pargament et al., 2000; Panzini, 2004) are (1) A negative reassessment of God, that permits an evaluation of how much belief in miracles in health contexts would result in a negative cognitive reassessment of the person's idea of God, raising disturbing interrogations about Him and His plans, for example, distressing doubts about His existence, power, love, protection, as well as about His responsibility regarding the gravity of his or her illness, which can be interpreted as divine punishment, thereby, harboring negative sentiments like anger, guilt, helplessness, and grievance; (2) Negative stance before God, by which the manifestation of the act of praying for a miracle can be assessed in the measure that it implies a request or simply hope that God takes control of the situation and takes up the responsibility of solving the problem without his or her participation, which could be expressed, for example, of the passive religious delegation or negative prayer, when prayer simply tends to modify the supposed divine will; and (3) Negative reassessment of meaning, according to which the attitude of praying for a miracle, in hospital settings, can be assessed in the measure that it results in interpreting negatively the meaning of the gravity of the illness as an act and/or consequence of Evil or as a punishment for his or her acts, style of life, errors or sins. In this last case, then, Evil would necessarily be associated with a personalized being figured as Demon, Devil, Satan, and Beelzebub, among other denominations; or to an abstract figure, like darkness, gloom, dark side, or Evil itself; or still, incarnated in figures that practice such evil, like evil spirits, forces of darkness, ill luck and/or other peoples' evil wishes to him or her. However, whatever the reason for falling into the grave illness without any perspective of medical treatment, it would be understood by the patient or caregiver as personal punishment or the result of

something evil. (4) Dissatisfaction with the Institutional Other, by which every behavior or SRC attitude, including praying for a miracle, would be assessed in the measure that it reveals sentiments of dissatisfaction, displeasure, or grievance with any institutional representative, be it a frequenter, member, or leader of the religious institution or symbolized by the set of religious or spiritual doctrines of the person.

It is, therefore, imperative that, for a concrete assessment *in loco* about the role of belief in miracles to be made according to the degree of its correspondence or not to each of the factors enumerated above, it will be necessary to assume a broader conception of miracle like that of Tillich (1967) or Saint Thomas Aquinas (1265–1273) for example, as was seen in *Praying for a Miracle – Part I* (Leal et al., 2022). In such a perspective, the miracle is taken as a kind of "signal-event," and which occurs as a reflection of something divine, but also natural, both from the point of view of aligning with the laws of nature—although inaccessible or completely inexplicable by scientific knowledge produced by humanity, and from the psychological point of view—based on the dialogue/communication between the desire of overcoming the condition imposed by the grave illness and another dimension superior to this desire, and which is lived as a sacred or divine order. It depends, therefore, on the modulation between the conception of miracle adopted by the patient and/or caregiver and the concrete outcomes of his manner of reacting to situations that accompany the gravity of his or her illness to assess how belief or hope in that "signal-event" will be healthy or not for each person involved; patient, caregiver and/or health professional. After all, as shall be seen later, the conception of miracle is experienced in conformity with the way that the person internally elaborates his or her dynamics of the search for existential meaning (spirituality) and how this answer is searched for in the transcendent (religiosity), which can be anchored or not in a specific religion.

Considering the modulation referred to above and its concrete reflections in health settings, we can understand the implications of belief in miracles from the standpoint of a second model, as proposed by Shinall et al. (2018), and elaborated from the concrete results observed, for example, in palliative care settings. As was seen earlier, in *Praying for a Miracle – Part I* (Leal et al., 2022), the above-mentioned authors classify the various modalities of belief in miracles into at least four patterns: (1) "Innocuous", which occurs when motivated by a belief in miracles, the patient or caregiver expects a plausible positive result, but improbable for a cure, without, however, sparking off conflicts with the health professionals monitoring the case; (2) "Shaken hope", when faith in miracle becomes hampered as a result of unfavorable clinical evolution, which does not often trigger conflict with members of the medical team, but spurs significant existential pain, affecting the quality of life of the patient; (3) "Integrated", when belief in miracles is based on religion and can be in discord with health professionals and ignite conflict in the doctor-patient relationship; and (4) "Strategic", when the patient's or caregiver's belief in miracles is characterized as one of the ways of affirming his or her power over the situation and impedes deeper discussions about medical intervention decisions, and thus being interpreted by health professionals as a negation of reality. It should be observed that, in this second model, the criterion of assessment of belief in miracles is not restricted only to the analysis of the characteristics of the patient or caregiver, but also takes into consideration its impact on the health professionals and their respective reactions. It is important to consider this in the measure that the reactions of the professionals also depend both on the way that they feel more or less mobilized about the specific way that their patients' belief in miracles is manifest, and also on the way they internally elaborate their own experiences related to spirituality, religiosity, and religion.

For assessing the impact of belief in miracles in health settings, a third model of a pragmatic nature was also developed from clinical experience and, especially, more applicable to caregivers of gravely ill children was developed by Bibler et al. (2020). According to this model, the ways by which beliefs in miracles can be assessed, from the standpoint of their concrete outcomes in healthcare settings, could be classified into three modalities: (1) "Integrated," when caregivers assess the clinical state of the child from a religious standpoint, making them not only carry religious objects in infirmary settings, but also, frequently establish confrontation with science; (2) "Procurators," when such caregivers depend on the religious community, but the miracle hope may assume meanings other than the belief of obtaining cure, for example, focusing on the wellbeing of the child; and (3) "Adaptable," when they present characteristics of having faith, without necessarily adhering to specific religions. In this last case, the caregivers generally, avoid talking about the miracles, but, on the other hand, are also suspicious of the strictly technical care given to patients, and may have recourse to other options in search of a cure for their loved ones.

One of the aspects common to the three models presented hitherto is the fact that all of them, in one way or the other, refer to three concepts that, generally, have been interchanged not only in lay discourse, but also in the technical language of the psychology of religion, be they concepts of "spirituality," "religiosity," and "religion." In fact, in the field conventionally called "psychology of religion," frequently renamed "psychology of spirituality" (Aletti, 2012; Paloutzian and Park, 2012; Pargament et al., 2013a; Freitas, 2017), there is a great conceptual variety, especially about the three terms mentioned above. They have received a more integrative, interdisciplinary, and multidimensional approach in recent years (WHOQOL Group, 1995; Pargament et al., 2013b; Selvan, 2013), considering their applicability in health settings and allied to the perspective that health cannot be reduced to the biological dimension or the mere absence of disease, but encompassing psycho-socio-spiritual aspects that are fundamental to wellbeing as advocated by the WHOQOL Group (1995).

Our starting point in this paper is the principle that, despite the inherent complexity of the terms, and the lack of consensus between diverse authors, the distinction between spirituality, religiosity, and religion, as well as their respective integrative approaches, are not only useful but also necessary and fundamental for a contextualized and dynamic approach of the different meanings of belief in miracles in the spiritual/religious coping with illness, stress and psychic suffering. In this light, the

next sub-item, of a more historical, conceptual, and philosophical nature has the aim of presenting an epistemological grounding to understand the possible connections and distinctions between the three terms. By doing so, we hope to foster a deeper understanding of the complex nature of belief in miracles and their outcomes in people's lifeworld (*Lebenswelt*).

CONNECTIONS AND DISTINCTIONS BETWEEN SPIRITUALITY, RELIGIOSITY, AND RELIGION AND THEIR RELATIONS TO HEALTH

A brief incursion into the works of great pioneers in the psychology of religion shows that, originally, the terms spirituality, religiosity, and religion were employed in much a complementary or practically undifferentiated way (Zinnbauer and Park, 2005; Freitas, 2017). However, with the advent of modernity, along with the processes of secularization, secular state, globalization, individualization of manners of spiritual-religious expression, and the demand for the applicability of methodological reduction of the transcendent to the psychology of religion and/or spirituality (Flournoy, 1902), so that it is recognized in the postmodern scientific scenario (Paloutzian and Park, 2021; Saroglou, 2021), there was an emergence of a conceptual landscape characterized by a veritable increase of differences between these terms, especially between spirituality and religion. Thus, it is common to find negative reports of religion and positive reports of spirituality coming from both researchers in this field and physical and mental health professionals (Freitas, 2020). In the same way, the expression "I am spiritual, but not religious" (Maraldi, 2014, 2022a,b), is frequently reported in interviews with psychologists and health professionals (Freitas et al., 2017; Freitas, 2020) has become more common, and paradigmatically represented in the work of the famous neuroscientist Harris (2014), titled *Waking Up: A Guide to Spirituality Without Religion.* The deadlocks created by this dichotomy and terminological polarization are numerous, and as a result, many authors have been critical and opposed to them (Zinnbauer and Park, 2005; Aletti, 2012), and trying to propose solutions to overcome them. However, these solutions, also, are not convergent (Zinnbauer and Park, 2005; Marques, 2010; Aletti, 2012), and oscillate between those that: (a) adopt a perspective of partial convergence between the religious and spiritual dimension; (b) understand religion as a more far-reaching field than spirituality; (c) understand spirituality as a more far-reaching field than religion; (d) differentiate both by the intensity and emotional involvement, with which they were lived; (e) maintain an absolute distinction between both and see them as opposed dimensions.

Relatively, the term "spirituality"—a concept of much fluid origin, derived from the Latin term *spiritus* and etymologically referring to the notion of "breath of life" (Hill et al., 2000; Carrette and King, 2004)—tends to be intimately associated today to the conception of purpose or meaning of life (Aletti, 2012; Piedmont, 2014; Cook, 2020; Freitas, 2020), and does not have any consensus among the authors. The contemporary scenario is paradoxical: concomitant to the plethora of studies and applications of the construct in clinical settings (Cunha and Scorsoline-Comin, 2019; Demir, 2019; Cook, 2020; Dein et al., 2020) are an endless barrage of stringent epistemological criticisms of the way that spirituality has been conceptualized and re-conceptualized in studies developed in physical and mental health settings. Examples of such criticisms are those that point to the excessive generality of the term, loaded with polysemic and vague meaning (Carrette and King, 2004; Paiva, 2004; Swinton and Pattison, 2010; Aletti, 2012) and also those that point to its tautological character when defined as almost a synonym of mental health, wellbeing or positive psychological or social traces in studies that aim at correlating spirituality to these same variables (Almeida and Koenig, 2010; Koenig, 2010; Curcio et al., 2013).

Another grave risk, that must not be ignored from the phenomenological-existential point of view, is that of the efforts to reduce the ambiguity of the term spirituality resulting also to its impoverishment and eroding of its original meaning (Freitas, 2017; Silva and Goto, 2020) such as genuinely experienced by people in their life world. In this sense, attention must be paid to contemporary contradictions: if, on one hand, the operationalization of the concepts enhances their application and validation in studies and actions that might be recognized in the field of health, on the other, this is accompanied by the risks of a grave alienation of that which is intended to be valued on bringing the subjects of religiosity and spirituality to this field.

The term religion, also derived from the Latin *religio*, even though it tends to evoke, immediately, complex representations that refer to the relationship of man with the transcendent, its original meaning is debatable from its etymological roots as rightly pointed out by the philosophers of religion Costa Freitas (1992) and Azevedo (2010). Thus, in the Roman version of Cicero, the term would date back to the notion of *relegere*, meaning something like "revolve in spirit, care for, take seriously, meditate", or still "decency and retreat, scruple and delicateness of conscience, fulfillment of duty to things and people, worship of the gods (Costa Freitas, 1992, p. 676). But in the Christian version of Lactantius and Tertullian, *religion* would be derived from the verb *religare*, therefore, referring to the attitude of devotion and piety that unites men to God. The notion of bond is highlighted here, a kind of rebinding, between humanity and a power that transcends it (Hill et al., 2000; Azevedo, 2010). The innumerous historical attempts to define religion are, therefore, situated in this semantic horizon and some currents opt for a more functional conception while others are characterized by a more substantive conception. Both approaches converge in the reference to a transcendent dimension, worshiped in form of laws, norms, doctrines, and/or moral rules, among other things, or experienced as a true existential response to the great questions of the meaning of human life. A phenomenological look leads to understanding the phenomenon of religion as a subjective/intersubjective process with attitudinal, communal, and institutional ramifications. Some part of contemporary psychological literature tends to attribute to the first of a more subjective order, the concept of religiosity (Valle, 1998) or intrinsic religiosity and/or not organizational (Koenig, 2011);

while, for the second, communal and institutional, it tends to reserve the terms religion (Valle, 1998) or organizational religiosity (Koenig, 2011).

On distinguishing the subjective and institutional level of the religious phenomenon, there are still, in literature, other dichotomous tendencies in the conceptual framework, including those that refer to their various forms of expression in the life world of people, forms that have been frequently classified between two groups, from the standpoint of substantive or pragmatic criteria. Examples of these are the classification of Allport (1950) into intrinsic and extrinsic religiosity, and the contemporary classification of Pargament et al. (2000) into positive and negative forms of religious coping, both originally from qualitative assessments, but later served the purposes of nomothetic studies, as the scale of intrinsic and extrinsic religiosity (Allport and Ross, 1967) and the scale of religious coping (Pargament et al., 2000). If the driving impact of such instruments is undeniable in the sense of allowing correlations between the multiple expressions of religiosity and many other variables associated with health, contributing to more credibility of Psychology of Religion in scientific circles, their excessive and indiscriminate use, frequently in ways completely dissociated from the epistemological foundations that gave its origin (Forti et al., 2020) and from the sociocultural characteristics where it is transplanted, also created problems, between them: the risk of an erosion of the notion of spirituality and its relations to religiosity (Silva and Goto, 2020), and the tendency of an artificial dichotomization between its various modalities of expression and respective dynamism. In *Praying for a Miracle – Part 1* (Leal et al., 2022), we see the vicissitudes of this process in the assessment of belief in miracles through the RCOPE scale (Pargament et al., 2000) and its respective translation for Brazil (Panzini and Bandeira, 2005), where the modality of spiritual/religious coping was previously associated to negative religious coping.

There is still another important ethical and epistemological outcome for the study of the understanding of miracles from the psychological point of view in health settings: the necessity of differentiating a theological approach from a psychological approach, respecting the dialogue between both, and with due openness to the contributions of other sciences, for example, medicine, in an interdisciplinary perspective. This implies recognizing that the religious cannot be reduced to the psychological, in the same way, that the study of the ontological reality of the transcendent cannot be attributed to psychology, but rather, the human experience with the transcendent. In other words, psychology cannot affirm or deny the objective existence of God, Jehovah, or whatever term that may be used to designate any kind of sacred or transcendent alterity. However, it is its responsibility to focus on the understanding of the human experience with the alterity in question. To put it in Husserlian terms, psychology should focus on the "lifeworld" (*Lebenswelt*). This, taken as a focus by scientific knowledge, should not be reduced to the point of completely losing it from sight (Valle, 1998), but, at the same time, in the case of religious experience, the demand for methodological reduction of the transcendence applies, e.g., as proposed by Flournoy (1902). In the case of studies directed toward belief in miracles, for example, this ethical demand implies necessarily qualifying the experience with the transcendent, as something that is constituted in the conscience of who lives it, but also suspending the ontological reality of the transcendent alterity (God, in Western society), considering it outside of the possibilities of hermeneutic recognition. This same demand should be placed before the health professional, especially in countries officially governed by the principle of a secular state, like Brazil. However, in the name of this principle, human experience, including belief in miracles, should not be reduced to mere medical or psychological categories previously established. This would amount to exercising secularism instead of secularity (Ranquetat Jr., 2008).

In fact, from the ethical and phenomenological point of view, the psychology of religion and/or spirituality should analyze human experience in its richness and diversity, be it of a subjective, intersubjective, social, and/or cultural nature, assessing not only the experiences of those that describe themselves as religious but also of those who regard themselves as spiritual but not religious, a reality that is more and more common in contemporaneity. In other words, such people often admit that they are propelled by the search for answers that should significantly satisfy their thirst for existential meaning, but assume that this thirst for meaning is not adequately satisfied through faith in the transcendent dimension. For some of them, this thirst is satisfied through art; while for others, through contact with nature, profession, philosophy, and/or science, and this often assumes for these people a "sacred" character. To legitimate, their experience implies defining spirituality in such a way that "suspends" the origin of "breath" that impels them in the search for meaning. This can be applied to the experience of many health professionals, especially doctors and psychologists who practice in health and hospital contexts – though not all, as many believe! (Freitas, 2020). In these cases, it becomes important to consider a conception of spirituality that does not make a pronunciation about the previous and founding ontological reality of the same dynamics of the search for existential meaning. In other words, it demands a definition of spirituality that does not negate and neither affirm its divine origin, but at the same time legitimates the search for meaning in life which also propels the life world of these people, though not necessarily finding their answer in the belief in God or in some other dimension that is culturally equivalent. That is to say, for these people, the essence of spirituality is concretized in the move of the search for meaning and not properly like the answer found through belief in the transcendent. For many of them, the answer will be found in the contact with nature, art, philosophy, professional practice, or science. At least, they describe themselves in this manner.

In light of the above, it is fundamental to find a conceptual model in the psychology of religion that considers the diversity of experiences (of patients, caregivers, and health professionals) that come across each other in hospital settings, in such a way as to enhance an understanding of the impact (positive or negative) of the belief in miracles in healthcare. The conceptualization of spirituality, religiosity, and religion in this model should, therefore, foster a simultaneously distinctive, integrative, and qualifying understanding of these three phenomena and their

manifestations in human experience, be it that of patients or health professionals. A simplified alternative, though not reductionist or dichotomous – of defining the three terms and presenting their complex interrelations is illustrated in **Figure 1**, reproduced from Freitas (2020, p. 204). It should be observed that the model proposed is open enough to compose the experiences of those that consider themselves spiritual but not religious as well as that of those that nurture a personal religiosity, not necessarily adhering to a specific and institutionalized religion. Meaning, in the same way, spirituality can move in the direction of other answers of meaning not peculiar to religiosity, the religious experience can also occur in the subjective domain but does not necessarily seek to be anchored or aggregated to a system of organized answers in the mode of dogmas or doctrines and/or institutionally shared.

Grounded on a phenomenological perspective, the model takes spirituality in the Husserlian sense and refers to an existential quest for meaning, but directed "exclusively to human beings as persons, to their personal life and activity, as also correlatively to the concrete results of this activity." And, as says Husserl (1965, p. 1): "Here the word 'live' is not to be taken in a physiological sense but rather as signifying purposeful living, manifesting spiritual creativity, in the broadest sense, thereby creating a culture within historical continuity." Thus, it situates spirituality in the original pole of the great questions about life, and existence, and is often formulated by the common person –but also by the religious, philosopher, or scientist—in this way: "where did we come from"?; "where are we and what are we doing here"?; "where are we heading to"?. As it is well known, even though such questions are a constant part of human existence, they become more overwhelming in situations of crises and great suffering, e.g., facing grave illnesses, gloomy diagnoses, and the finitude of life.

To effectively understand spirituality, it is necessary to understand also how it propels those who practice it. Thus, belief in a transcendent, sacred, creating, infinite, ultimate, or beyond the human has constituted a kind of response that accompanies humanity historically and geographically in all known cultures. This way of responding to the quest for meaning is given the name religiosity, which may or may not is shared collectively as happens in religion. The answers to the great questions about meaning can naturally be sought in various other ways, either through contact with nature or art or through philosophy or scientific activity as was previously pointed out. Nevertheless, a significant majority, especially the Brazilian population (Instituto Brasileiro de Geografia e Estatística., 2010), are crystallized in religious adherence. So, in the face of adverse, limiting, and incomprehensible conditions capable of threatening existential meaning, these people, mobilized by the search for the meaning of their experiences, seek answers for their interrogations in a dimension that is beyond them, nurtured by the belief in a being, force or superior energy, capable of responding to them and bring consolation, comfort, serenity, resilience, and/or hope.

When the ways of finding answers to existential interrogations through religiosity are collectively shared, in an institutionalized way, forming a social hierarchically organized entity, or characterizing a cultural identity of a people (as it is the case of indigenous people for example), the concept of religion is applied. The experiences of religiosity and religion, therefore, constitute religious people's experiences, through which connectivity to the response is attained, propelled by the quest for meaning, in other words, by spirituality. Besides, in addition to the answers offered by institutional dogma, systemized doctrines in specific modalities of belief and value, normative and behavioral guidelines, or leaderships that represent them, is the psychological role played by the feeling of belonging, reception, and support offered by the network of adherents of the doctrine in question, besides a series of other outgrowths that delineate the features of the quest for meaning, alleviating grief, anxiety, helplessness, and despair, that is frequently unleashed by unexpected, limiting and disastrous news, including naturally, gloomy diagnoses received in hospital settings about one's health or that of a loved one.

BELIEF IN MIRACLES AS AN EXPRESSION OF SPIRITUALITY, RELIGIOSITY, AND/OR RELIGION

The questions of a conceptual nature about the experiences said to be spiritual or religious are important for an understanding of the belief in miracles and their impacts on the actors in hospital settings, not in the sense of arriving at a final decision about what would be a "correct" conceptualization of what spirituality, religiosity, religion, or miracle itself is. Instead, they are important for their pragmatic outcomes, either in the field of research, permitting a clearer communication about these questions, or in terms of its concrete applications in healthcare. It is, therefore, from this perspective that we aim to direct the reflections stemming from the conceptual model previously proposed and its respective applicability for understanding belief in miracles and its respective role in health settings.

The notion of spirituality as a propelling force in the quest for existential meaning makes it possible to think of health, from a broader perspective, where at stake is not only a biological body or medical rationality restricted to the technical operationalization of the human, whereby the physical, biological and material aspects become prominent over social and teleological aspects. Now, a more far-reaching understanding of health makes existential liberty necessary both for patients, caregivers, and professionals, to own up to themselves in their existential questions and respective quests for meaning, and at the same time permit them to be more sensitive to the different ways and paths by which the other also makes the search. It is within the scope of this same liberty and sensitivity that belief in miracles can be recognized as one of the possible destinations in the natural quest for meaning. In this existential move of propelling hope, we can understand its dynamic character, the motivation for searching for meanings and purposes, how the person connects with him/herself, with illness, with the other, with the cosmos, and with self-transcendence, unfolding into specific ways of elaboration of religiosity. Rooted, then, in this intrinsic move of spirituality, the propeller of meaning, the belief in miracles can have different destinations, even those described

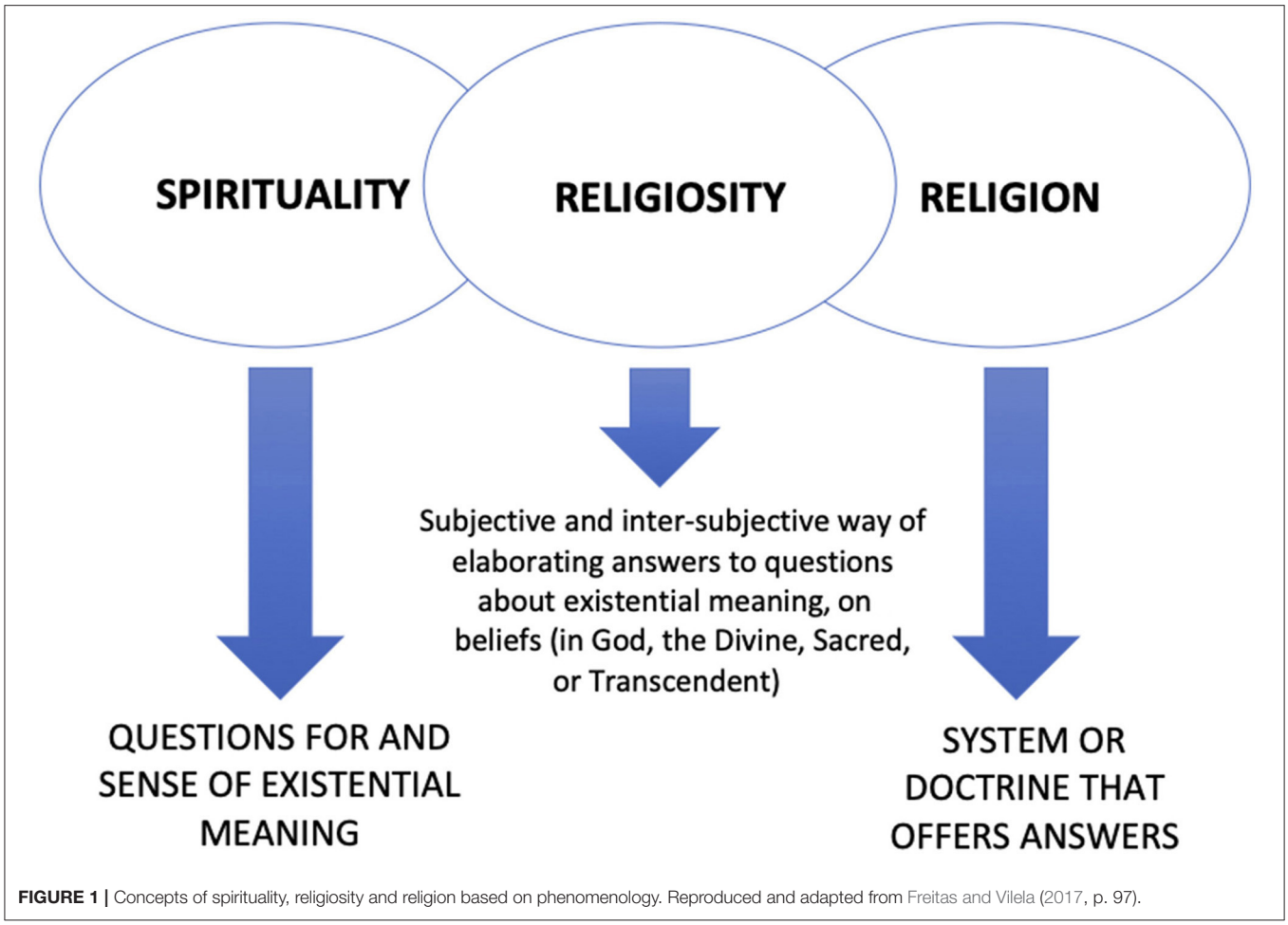

FIGURE 1 | Concepts of spirituality, religiosity and religion based on phenomenology. Reproduced and adapted from Freitas and Vilela (2017, p. 97).

as positive or negative in the Pargament et al. (2000) scale. So, for example:

a) On acquiring a transforming character of oneself or one's own life, modes of belief in the miracle can be seen unfolding, corresponding to the description of the first positive factor contemplated in the referred scale;
b) On mobilizing actions that result in offering or obtaining concrete help from others (such as an individual, family, institution, or specific groups), will result in aspects described in the second, third, and sixth positive factors of that scale;
c) On strengthening one's self-help potential or personal growth resulting from a deep search for contact with oneself, based on an unshakable faith and in the certainty of the support of a greater force, also promotes a positive position toward God and the consequences contemplated in the fourth, fifth and seventh positive factors of the same scale;
d) On manifesting itself as a form of temporary distancing from the problem to gain time and remodel the desire for health and healing, it also favors a change in perspectives, as seen in the eighth positive factor of the scale in question;
e) However, on the other hand, when it crystallizes in certain attitudes that deny reality or in interminable supplications, it can result in a disappointment with religion itself, if personal desire, of a narcissistic nature, and projected on religion and/or perspective of the miracle of healing does not take place, characterizing one or more of the four factors of religious coping described as negative described in the scale originally developed by the aforementioned authors (Pargament et al., 2000).

The model developed by Shinall et al. (2018) can also be understood even better from this broader perspective, where how faith in the miracle is manifested - or the expectation of its occurrence, in situations of very bleak diagnoses – is related to this line of continuity between the notions of spirituality, religiosity, and religion. Thus, for example, the modes of manifestation in the miracle may have destinations characterized as "harmless" or lead to a kind of "shattering of hope" if they are sustained only in a rigid, crystallized religious perspective, confused with the most narcissistic desires themselves, and without spaces for the propulsion to re-signification and for the rediscovery of meanings in the disease itself, which would be driven by spirituality. Or, even as a movement anchored on religion, the belief in the miracle can be a driving force for greater or lesser "integration," also depending on the way the professionals themselves conceive the religiosities of the patients themselves and react to them in the hospital context, many sometimes disagreeing with the forms of meaning sought through them. Depending, then, on this mediation between the impulse to search for meaning, as something that is at the base of belief, and respect for the different ways of achieving it

(whether in one religion or another; whether in religion and/or in science), the relationships between patients and professionals may contribute, in a greater or lesser extension, to a more or less "strategic" destiny of the belief in the miracle in the health context.

In the same direction, one can understand the effectiveness of the model proposed by Bibler et al. (2020). After all, a dynamic understanding of the relationships between these three dimensions—religion, religiosity, and spirituality—can open new paths in the attitude of the professionals themselves when dealing with patients' religiosities, expanding their respective abilities to embrace the dimension of meaning that accompanies them, favoring a more "integrated" approach between the religious/spiritual perspective of the miracle and the perspective of medical care. Such skills will be essential to better relationships both with those who present themselves as true "proxies" and dependent on their religious community, as well as with the "adaptable," whose faith characteristics are not necessarily linked to specific religions but are also moved by a spirituality that sustains their respective beliefs in the miracle.

After all, from this broader perspective, belief in miracles is no longer seen as violating natural laws or technical knowledge in medicine (Doessy, 2018), but recognized as a genuine manifestation of the desire of living with meaning (Saad and Medeiros, 2018). This is in keeping with a vision of health also more far-reaching and not restricted only to organic or psychic wellbeing as Dejours (1986, p. 9, *emphasis ours*) points out:

> "Health is certainly not psychic wellbeing. **Health is when having hope is permitted.** It can be seen that this changes things a bit. What makes people live is, above all, their desire; this is an achievement of psychiatry and psychosomatics. The real danger exists when there is no more desire when it is no longer possible."

Seen from this angle, we recognize the belief in miracles, a propelling act of hope in a less painful future. Under this perspective, the experience of "praying for a miracle" initially occurs as an act of openness to life instead of immediate closure in a gloomy perspective existentially imposed by a technical and scientistic perspective. This openness is healthy, from the psychological and existential point of view, as far as, through it, the necessary time is gained so that the painful realities of a gloomy diagnosis like fetal congenital malformation (FCM) in pregnant women or child cancer may be re-signified in the psyche of the expectant mother, of the child, or its family members. This understanding, however, is only possible considering a flexible and integrating model of conceptualization, where both the distinctions and connections between spirituality, religiosity, and religion are taken into consideration.

In a model where spirituality refers to the impulsion of meaning and the search of answers to human existence and its vicissitudes, the intentionality and human capacity of reflection about him or herself, and about the experience in the surrounding world is genuinely qualified. As such, it can refer to or be based on religiosity whose answers of meaning are rooted in the transcendent, and they may or may not be linked to a particular system of sharing under the form of doctrine, dogma, and/or institutionalization. Belief in the possibility of a miracle in the face of bleak diagnoses can then be a mechanism of positive or negative religious coping according to the degree of subjective or intersubjective flexibility that circulates between these three dimensions. So, belief in a miracle, represented by the act of praying for one, appears as a positive component of SRC, when nurtured by a spirituality that results in the search for meaning, sparking off hope to cope with desolating sentiments such as grief, guilt, or anger about pregnancy with FCM or having a child with cancer. The hope of a miracle, for expectant mothers with FCM or family members of carcinogenic children can be a way of avoiding the reality without denying it, constituting part of a process of psychic adaptation to suffering and culminating in the search for the meaning of the lived experience, often represented in the apogee of the re-signification, through maternal love. It can also be a kind of network support where family members nurture the hope of the patient who is still under the harsh impact of the gloomy diagnosis. Thus, through their prayers for a miracle, they strengthen affective bonds and reciprocal support among themselves until they are more emotionally prepared to cope with the limits or complete impossibility of reversing the diagnosis. This can be a much more positive process when it is prone to be elaborated and preparing for a re-signification of the meaning of the diagnosis for the life of all the people involved.

Nevertheless, the negative aspect of belief in miracles is also observed in clinical practice when the expectant mother or family member of the child with cancer (or some gloomy diagnosis) insistently seeks what is an improbable, cure, even in the face of medical evidence for such. When such a search is based only on dogmas that some religious institutions adopt and diffuse, being static and grounded on a linear interpretation of "miracle," serving traditions or orthodoxies inclined to religious fundamentalism, it can be problematic and impervious to the process of re-signification over time. In this situation, the religiosity of the expectant mother or family member is not properly focused on transcendence, but on the pragmatic result desired by him or her, in many cases, rooted in a religious doctrine. In other words, the belief in the possibility of a miracle in the face of bleak diagnoses can be a mechanism of positive or negative religious-spiritual coping according to the degree of the subjective flexibility or inflexibility that permeates the dimensions of spirituality, religiosity, and religion. Or still, when rooted in a perspective where the dimension of meaning is not kept open, capable of incorporating the suffering as replete with signification through the exercise of auto reflexivity. In these cases, belief in miracles would be anchored on a more reductionist vision of the transcendent taken as a dimension at the mercy of the individual and emotional necessities. Its negative impact granted its egocentric and (de)negating character of the surrounding reality, flows consequently. It is exactly in these cases that arise the necessity of developing skills and socio-cultural competences in the psychology of religion or applied spirituality by health professionals and inter or multidisciplinary teams to handle the question. This would be the subject of a future paper.

AUTHOR CONTRIBUTIONS

MF and ML intellectually conceived the paper. MF wrote the paper with the help of ML and EN. ML and EN revised the paper.

EN did the translation and corrections. All authors contributed to the article and approved the submitted version.

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