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Reviving life that has ceased on October the 7th: an attachment perspective on a virtual reality intervention

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Unfortunately, in recent years, wars have forced many civilians to evacuate their homes and move to safe zones. The event of October the seventh that took place in many Kibbutzim near the Gaza strip, exposed families who were on a Jewish holiday, to the murder of family and community members. They had to leave their burned houses and move to hotels and apartment buildings in other parts of Israel. Many people, also from the Northen parts of the country, are still in new safe zones, and have huge difficulties in returning to their houses (and not only because of objective security reasons). In this "perspective" article we propose a Virtual Reality (VR) application, which is based on past and current research in the fields of attachment theory and traumatic grief. We propose that in addition to the use of exposure therapy, a VR simulation which will activate the attachment system, can reorganize the evacuees' figure and place attachment representations. We suggest that such a simulation will revive the evacuees' sense of safe-haven and secure base and enable them to return to their home place, or to adjust to a new place, thereby leading to optimal adjustment. We start with a presentation of the theory of attachment, place attachment, attachment and loss and the two-track model of bereavement. Then, we describe the design of our VR intervention that aims to address this challenge from the attachment theory perspective with the evacuees. Finally, we discuss the challenges that need to be dealt with to implement the VR interventions through resilience centers in Israel.

KEYWORDS

bereavement, place attachment, PTSD, traumatic grief, virtual reality

Introduction

On October the seventh, the Hamas attack on civilians near the Gaza strip left many homes destroyed and force the mass evacuation of thousands of civilians. People of the Kibbutzim were attacked, murdered, and burned alive in their houses. Survivors saw loved ones slaughtered before their eyes. Community members were kidnapped from their homes. These events took place at their Kibbutz, at a place where their community had flourished for years, which they considered their safe-haven. This resulted in a brutal attack on their attachment system, on their sense of home attachment and on their sense of safety.

"Attachment system", "home attachment", and "place attachment" are three relevant terms derived from Bowlby's theory of attachment (1988). These terms can be used for understanding the trauma that the Hamas invasion on the Kibbutzim has inflicted on thousands of civilians, who have been forced to leave their burned houses and move to hotels and to apartment buildings in safe zones. The following perspective paper proposes a novel approach to using virtual reality (VR) simulations, beyond VR's common use to deliver prolonged exposure therapy, as a tool to address trauma informed by an attachment theory perspective.

The theory of attachment

The attachment system is based on a biologically central tendency of mammals to seek closeness to a supportive figure in times of need (attachment figure) and has a developmental role of protection and survival (Bowlby, 1988; Ainsworth, 1989). When the attachment figure is responsive to one's proximity- and support-seeking bids in times of need, it promotes a sense of attachment security (Bowlby, 1973; Bowlby, 1988). Ainsworth (1991) suggests that humans turn to attachment figures in times of need to attain: (a) An emotional and physical *safe-haven* that is capable of alleviating fear and distress and (b) *a secure base* that enables one to explore, learn, and thrive in a confident and curious manner personal desires. In this way, interactions with a responsive attachment figure to one's proximity- and support-seeking in times of need can alleviate distress while inducing relief and comfort (the safe-haven function), which motivate one to step away from safety and explore (the secure-base function).

Proximity-seeking in times of need is an integral part of human nature (Bowlby, 1988). When the attachment figure provides the desired support, it boosts the supported individual's felt security and fosters the formation of positive mental representations of self-worth and others' benevolence (Bowlby, 1973). Interactions with attachment figures who behave in a rejecting manner disrupt one's sense of security and promote insecure attachment orientations. These orientations are conceptualized and measured along two dimensions: attachment anxiety (worries about one's lovability) and attachment-related avoidance (distrust of other people's goodwill and inhibition of relational closeness, e.g., Brennan and Shaver., 1998). Children, adolescents, and adults with a stronger sense of attachment security (lower scores along anxiety and avoidance dimensions) show greater self-esteem, reliance on more effective ways of coping with stress, better distress management, wellbeing, and mental health, and are more likely to form and maintain satisfactory close relationships across the life span (Mikulincer and Shaver, 2016).

People can also become attached to objects, substances, or places that are associated with felt security (Mikulincer and Shaver, 2023). Place attachment relates to the cognitive and affective connection between people and their place of living (Hidalgo and Hernandez, 2001; Hidalgo and Hernandez, 2002; Chow and Healey, 2008; Rollero and De Piccoli, 2010). It has been criticized for only referring to the strength of the emotional bond to home (Cross, 2015). However, place attachment is not a unidimensional construct, because people can feel secure or insecure about their home as a source of protection and comfort in times of need and thereby form anxious (worries about feeling unsafe and unprotected at home) or avoidant (inhibition of proximity-seeking tendencies toward home) place attachments in such times (Bowlby, 1980). Such sensations are derived from positive or negative memories of interactions (e.g., family celebrations, family conflicts) and experiences directly related to home (e.g., relaxation and comfort, home accidents, death at home, natural disaster) (Klass et al., 2014). When traumatic events happen in one's home, it is proposed that a person's memory erodes the basis of security that home attachment provides. Alongside the damage to the individual's sense of security remains the longing to regain this sense by reestablishing a safe home in the place where the traumatic event occurred.

Attachment and loss

Memories of October the seventh massacre, which are continuously being reactivated by media reports can strongly instigate the longing of the evacuees for their dear ones and the fantasies of returning to their lost home. According to the theory of attachment (Bowlby, 1988), if the close attachment figure or entity (such as home) is perceived as physically and symbolically close and accessible, the attachment system is calm. However, if the range of closeness is exceeded physically or symbolically, the person experiences a threat to the relationship with the attachment figure, or to the sense of attachment to place, and feels separation anxiety. When this occurs, behaviors are created and are expressed to re-establish the connection and the sense of security that was lost. Searching, clinging, crying, complaining, expressing anger, and getting close with others in the community accompany such anxiety. As soon as the connection is renewed, anxiety decreases and these behaviors cease.

However, people who experienced the October 7th massacre cannot reconnect with their killed loved ones and their destroyed house. This irreversible loss demands a person to mourn and adapt to the new reality of living without the physical presence of people and places who were sources of felt security before October 7th. Moreover, due to the cruelty of the unexpected atrocities, these experiences can lead to "traumatic bereavement" which may result in a mixture of PTSD symptoms and acute grief (Rubin et al., 2020). Traumatic memories can be instigated by the exposure to external stimuli of the traumatic event (e.g., sights, sounds, smells, pictures). Then, involuntary spontaneous re-experiencing of the event in the form of dissociations (e.g., flashbacks, daydreaming, or nightmares) can occur, become overwhelming, and result in defensive maneuvers of cognitive avoidance from talking or hearing about the trauma and the loss, or in behavioral avoidance of external stimuli which trigger their traumatic memories.

According to Bowlby (1980), following irreversible losses, people need to go through two psychological processes: (1) to accept the loss, return to everyday activities, and rearrange or "edit" the attachment-figure network by forming new attachments or upgrading old ones; and (2) to maintain a symbolic attachment to the lost figure and integrate the lost relationship into a revised model of reality, including one's model of oneself (Bowlby, 1980). Through these two processes, they transform the functions of lost persons, objects, or places (e.g., house) so that these figures become a

symbolic source of security rather than a flesh-and-blood source, while new or strengthened emotional bonds with available people and safe places/houses are formed (Stroebe and Schut, 2010). In this way, the lost figure continues to live symbolically within the person, provide felt security, and fortify his/her search for alternative new sources of security (Bowlby, 1980). This analysis corresponds with Stroebe et al.'s (2016) proposal concerning the mitigation of homesickness by encouraging people who left their home to incorporate the lost place into the way they perceive themselves and acknowledge their new place of residence as secure.

The two-track model of bereavement

When people cope with irreversible losses, they can fully detach from the lost people, objects, or places they loved and then avoid the pain of the loss. However, exclusive reliance on this kind of detachment for coping with the loss might impede mourners from using their lost figures as internal symbolic sources of security, integrating them into their self-identity, and renewing a sense of self-continuity (Bowlby, 1980). Beyond concentrating on new beginnings and forming new attachments, mourners should optimally integrate the past losses into the way they currently perceive themselves and construe their future relationships. These processes are clearly depicted by the two-track model of bereavement (Rubin et al., 2012; Rubin et al., 2020) -- a prototypical exemplar for how the reorganization of the attachment-figure network is manifested in traumatic grief. It provides a framework for a bereavement process that enables successful adaptation to life after the loss while maintaining strong symbolic connections to the lost figures in the present.

The two tracks are complementary. Track I enables some degree of detachment from the lost people, objects, or places, which decreases painful feelings and improves adjustment. This track includes biological, behavioral, cognitive, emotional, intrapersonal, and interpersonal processes by which the mourner adjusts to the new reality without the lost figures. Track II integrates the past into the present without detaching from important memories, images, and associations related to the lost people, objects, or places. Specifically, Track II keeps the lost people, objects, or places as vital part of the mourner's self-identity through symbolic rituals and ceremonies and acts of memorialization of these figures.

Whereas therapist's emphasis on the first track enables the mourner to move forward, search for alternative sources of security, and adjust to the new reality, the therapeutic work on the second track focuses on the story of the past loss and on how it is being assimilated and integrated by the mourner. By considering both tracks, painful memories of the past trauma may be integrated within the safety that new relationships and places (a responsive therapist, supportive others, a warm and safe place) provide in the present. The therapist is required to enable a gentle oscillation (Stroebe et al., 2005) between detachment from (Track I), and symbolic attachment to (Track II), the lost people, objects, or places. In this way, the therapist encourages the mourner to accept the loss while sensing the safety and comfort that the lost figures (e.g., person, home) provided and to help them move forward with other relationships or places that produce joy and security.

In our view, a VR simulation, which enables and sustains this gentle oscillation between detachment (Track I) and symbolic attachment (Track II) can be useful in facilitating therapeutic change among evacuees who lost their house. Such an interactive simulation will enable the therapist to encourage mourners to move to Track I and partly detach from the past losses by reorganizing their new home in the present and engage in planning the creation of a future house. Nevertheless, the therapist will also offer the mourner the option to integrate the distressful memories of October the seventh, by commemorating features of the lost house (e.g., furniture, colors, toys) and keeping symbolically alive people who lived with them at this house (e.g., names, WhatsApp messages, clothes). This VR oscillation between the two tracks will integrate the loss into the new reality and enable optimal adjustment after the trauma.

VR exposure therapy for PTSD and for traumatic grief

When traumatic grief is developed, Virtual Reality Exposure Therapy (VRET), which is empirically supported for treating PTSD (Rothbaum et al., 2001; Rothbaum et al., 2014; Rizzo et al., 2010; Rizzo et al., 2024; Baños et al., 2011; Difede et al., 2014; Difede et al., 2022; Botella et al., 2015; Reger et al., 2016; Beidel et al., 2017; Beidel et al., 2019; Loucks et al., 2019; Folke et al., 2023), and grief and traumatic grief (see review by Pizzoli et al., 2023) may be used. VRET provides a low-threat context wherein the client can begin to confront and therapeutically process the emotions relevant to a traumatic event and facilitate fear. VRET can deliver ecologically relevant simulations within which patients experience systematically delivered exposure to feared or trauma-relevant trigger stimuli in the safety of the clinical setting. This capacity to precisely control the stimulus presentation in VR allows graduated exposure with the end goal of promoting extinction learning and subsequent fear/anxiety reduction (Maples-Keller et al., 2017; Wenrui et al., 2019).

Exposure by EMDR and cognitive behavioral imaginary or expressive techniques have also been documented to be effective in decreasing avoidant behaviors due to traumatic memories related to losses, in increasing the expression of feelings and thoughts about the deceased (Simon, 2013), and in enhancing repeated exposures to the story of the death (Wagner et al., 2006; Boelen et al., 2007). The repeated exposure to objects related to the deceased (e.g., photos, audiotapes, video clips) helps to induce sense of closeness to the deceased and provides an opportunity for the mourner to replace non-adaptive behaviors with more adjusted ones, such as talking to the deceased (Worden, 2018). Moreover, mourners with post-traumatic or anxious symptoms, which are more likely to be present after violent deaths (Kaltman and Bonanno, 2003), are the best candidates for VR interventions. Clearly people from the Kibbutzim who were exposed to the atrocities of October the seventh fit this pattern. Researchers (see Pizzoli et al., 2023) elaborate on the power of careful immersion and sense of presence created in VR interventions for grief and for traumatized grief as effective ways to fulfill a dysfunctional need.

Design for an attachment theory-informed VR intervention for evacuees

When dealing with traumatic grief, prolonged exposure therapy and VRET mostly focus on Track II (re-experiencing the loss), and much less on Track I (adjustment to the new reality and forming new relationships). In the intervention proposed, the VR therapy deals with both tracks, by affording the evacuees the option to be exposed to past (Track II), as well as to the present and future (Track I). The "past" part deals with Track II and can help the evacuees to re-experience the events of October 7 and re-activate and re-process memories about their lost home and beloved others in a gradual manner, which can reduce the risk of becoming overwhelmed by distress and reflexively avoiding the exposure.

Here are examples of such a remote exposure to the past along track II. At the beginning of the VR experience, the participant can be exposed to an avatar recreation of a deceased person in which the avatar does not look ill. At the same time, participants will be afforded the option of choosing the level of damage to their house. As well, participants will have a controller button that can allow them to turn off the scene, if they feel overwhelmed by distress and want to share and process the experience with their therapist. In this way, exposure to the traumatic memories of the past will be gradual and at a pace that can be adjusted individually, as in previous VRET simulations and treatment approaches (e.g., Maples-Keller et al., 2017). Adults will then have the option to defend against October the seventh terrorists by shooting them, while children will be provided with "superhero" forces to repel terrorists by having the option to don a Spiderman/Superman/*etc.*, type suit to engage in this process.

The "present" part (Track I) is intended to help the evacuees to search for new alternative sources of felt security by reconstructing/renovating their homes and thereby moving along the adjustment pathway. To achieve this, participants will have access to a variety of options. Children living with their parents will be invited to play an active role in the family discussion about the renovation process of the house. They will be encouraged to suggest improvements and rearrange their virtual rooms. Activities such as picking up fallen chairs, repairing broken doors, choosing patterns of wallpaper or flooring, cleaning the floor or painting the walls will be offered. Track I will also include the yard of their house and users will be allowed to drag objects from a pool of objects to decorate this yard, upright a fallen tree, plant new trees and flowers, or activate sprinklers.

In line with the principles of gradual exposure (e.g., Maples-Keller et al., 2017), participants will then be moved to the safe room, the place which failed to protect them. Returning there can be stressful, as it is not only a reminder of the personal threat but also a trigger for a national threat for holocaust survivors who were hiding from the Nazis in small spaces during world war II (https://www.timesofisrael.com/a-holocaust-survivor-takes-a-different-route-to-remembrance-after-october-7/). In order to regain feelings of safe haven within the safe room, users will be suggested to make the walls of the virtual safe room thicker, improve its safety or even enter leisure activities to the room (e.g., put virtual Gym equipment, or a large TV screen). The renovation may fortify the movement on track I, that is, the reediting of the home attachment network by forming new attachments or upgrading old ones. In this way, the attachment to home and to family figures is postulated to be strengthened.

In this regard it should be noted that while the exposure will be done with individuals, as previously mentioned, it is also possible to conduct it in a coordinated fashion with family members. In such case, the VR headset can be shared from one member to the other. The sight which appears in the headset will be projected on a computer screen, so each family member will follow the visual experience of the family member using the VR headset at the time. In this way, repeated, gradual, and less aversive indirect re-exposures to the traumatic event will be possible and family members can provide support and encouragement and act as caregivers and care-recipients to one another. This form of real-time familial social support is believed to enhance or re-engage compromised attachment processes.

After dealing with the present, the "future" section of the VR simulation will be available. The immersion in the future is believed to support track I, by supporting a realization that the future can bring new and attractive opportunities following the loss. Users will be offered to enter one of the years between 2025 and 2034 and they will look for the positive developments that resulted from the house renovations they implemented in the "present" section. For example, children's rooms may now look like rooms for adolescents. The furniture or the walls may now look more modern. Planted flowers or new trees in the house yard may grow and provide shade. Moreover, participants will be asked to return to the present and choose objects that will make their surroundings flourish in future. In this way the broaden-and-build cycle of attachment security can be restored through Track I (Mikulincer and Shaver, 2016).

The "future" section of the VR simulation will also support the gentle oscillation between Track I and Track II and then facilitate incorporation of the past into the future without splitting off important elements of personal and social identity related to the lost house and relationships. For that purpose, participants will be provided with options to grasp objects symbolizing their attachment to the old house (e.g., furniture, toys, stones that remained from the demolished house) as well as symbolic cues for lost beloved ones (e.g., writing the names of the deceased or titles of songs or singers they liked, writing sentences of farewell that the deceased sent to their families through WhatsApp messages before they were murdered, by allowing for the arrangement of personal belongings of the deceased in a commemoration corner in the new simulated house).

To reduce complexity, the location of the house will not appear in the simulation, and the issue of future attachment to the Kibbutz community can occur via processing discussion with therapist. To reinforce renovative and commemorative responses (and the gentle oscillation between Track I and Track II) in the "present" and "future" sections of the VR simulation, as the participants' responses increase, positive environmental reactions can be actuated. This can been experienced via increases in the sounds of singing birds, the occurrence of "warm" changes in lighting/atmospheric effects, and the presence of calming music, all concordant with user activity.

Discussion

The research literature has documented the effectiveness of various forms of trauma-focused VRET approaches to support

patients in the confrontation and re-processing of traumatic memories/losses resulting in decreases in PTSD symptoms and pathological bereavement. In this "perspective" article we described a new VR simulation for the treatment of trauma and the traumatic grief of civilians who were exposed to the murder of Israeli family and community members during the October 7th terrorist attack by Hamas. These civilians had to leave their homes and move to other safe zones in the country. This will be a challenging intervention to implement, as at the time of this writing, the country is still at war and affected communities are still displaced to other locations. Thousands of evacuees are currently still staying in hotels. Moreover, many of them still find it difficult to return to their kibbutz, even to take their belongings, and to stay there for a while (beyond objective security reasons).

Our VR simulation approach is designed to afford them the possibility to accept and adjust to the loss through a VR intervention along the two-track model of bereavement. With the use of our VR/attachment theory approach we aim to decrease the evacuees' avoidance of behaviors and process the memories regarding their loss. We also aim to replace non-adaptive behaviors in response to the agony of the traumatic loss with more adjusted behaviors. This is hypothesized to occur via the proactive reconstruction/renovation of a virtual replica of their home and with the preservation of beloved aspects of the lost house in planning for a brighter future (Worden, 2018). Moreover, since some of the non-adaptive behaviors take the form of PTSD symptoms (e.g., guilt feelings, intrusive memories of, and avoidance from, trauma-related stimuli), the VR simulation will also encourage/enable evacuees to talk about these symptoms, whether individually with the therapist or with their families in group sessions.

To the best of our knowledge, this is the first perspective article on a VRET intervention based on an attachment theory model, for populations who have had to depart from their homes due to the atrocities of war. Upon completion of the VR system development, this therapeutic approach will be disseminated via partnerships with social workers and psychologists at several resilience centers in southern Israel. We estimate the number of required sessions as 6–10 sessions (Knaust et al., 2020). Successful implementation of this approach will initially require clinical experts who will teach and supervise teams of psychotherapists to conduct these interventions. Thus, our first step will be to teach experienced personnel the protocol of this VRET intervention and create methods to control its provision, knowing that the instability of the region may also affect the intervention. However, based on the best evidence regarding the importance of attachment security for distress management, wellbeing, and mental health (Mikulincer and Shaver, 2016), and considering the suffering of the evacuees, we are determined to implement it.

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

EB: Conceptualization, Writing–original draft, Writing–review and editing. MM: Conceptualization, Writing–review and editing. EM: Writing–original draft. AR: Writing–review and editing.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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