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Music and movement pedagogy in basic education: a systematic review

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The use of movement in music education addresses the most natural way to express and represent music itself through the body. It belongs to the history of pedagogy in music education and empirical research from the 1970s. For this study, we conducted a systematic review of works that link music and movement pedagogy, from early childhood to secondary education, to establish a revision framework of the existing literature as a reference to advance in the field of pedagogy and music education research. We analysed 29 articles found in the Scopus database from 2013 to 2023. The results are presented in a PRISMA 2020 Flow Diagram and can be categorised into two emerging areas of intervention: (1) Music and Movement Education; (2) Teaching with Music and Movement in Special Education. Research findings are analysed and presented, and their contributions to education and teaching implications are discussed. Music education and movement pedagogy fosters correlative physical, cognitive, and emotional development and promotes education for all students as an inclusive musical pedagogical approach.

KEYWORDS

music and movement, pedagogy, basic education, special education, systematic review

1 Introduction

The child's first acquaintance with music (perception and expression) involves hearing and interpretation as a means of artistic expression. Through music, children stimulate their creativity and their vocal and corporal expressive capacity, improving their understanding of the world around them by involving the development of skills such as observation, interpretation, and expressive freedom (Lacasella, 2023; Posso-Pacheco and Barba-Miranda, 2023). Research studies in education highlight the importance of early contact with music during childhood. Several neurodevelopmental studies conducted in recent decades show how children, who are exposed to music from an early age, improve their cognitive development in areas such as attention, memory, perception, and language (Cooper, 2010; Linnavalli et al., 2018; Frischen et al., 2022), their motor development with rhythmic movements helping coordination, laterality, and motor efficiency (Turner, 1998; Zatorre et al., 2007; Nguyen et al., 2023) and their emotional development by encouraging the evocation of emotions, the expression of feelings, the connection between body and mind, and psychophysical relaxation (Koelsch, 2014).

The use of movement in music education approaches a natural and intuitive way of expressing the interpretation of the musical elements, allowing for experiential learning,

understood as “the process whereby knowledge is created through the transformation of experience” (Kolb, 1984, p. 38). Thus, the learning cycle includes experiencing, reflecting, thinking, and acting. Research suggests that students are more engaged and motivated when taught music through movement, due to its interactive, dynamic, and reflective nature (Jo Pogue, 2018). Listening to music can evoke, guide, and organise the movement. In fact, when we listen to music, our body responds in synchrony with the musical rhythm (Greenhead, 2020) and activates memories and emotions (Thaut, 2005). The motor response is an intuitive way of representing musical characteristics that promotes the understanding of music and aids the development of the child’s musical thinking, body awareness, and self-expression.

By incorporating movement, teachers can offer to students new perception channels to feel and understand the music and activate their creativity through their performances, which in turn can enhance their understanding of the elements of movement, including body awareness, dynamics, space, and energy (Laban, 1963; Schinca, 2002; Motos et al., 2022). Some approaches of music teaching, such as Dalcroze’s Eurhythmics, include movement for the understanding of music. This approach stimulates body perception as a sounding board, where learning takes place in processes of interaction through subjective, transformative experiences that develop creativity, social skills, and self-representation (Juntunen and Westerlund, 2011; Habron and Bachmann, 2016; Grandjean and Labbé, 2017). In approaches like Dalcroze or Orff, the movement that accompanies musical learning connects body, vocal, and musical language in an artistic activity, providing meaning to learning. From these approaches other derivative methods have emerged. In them, body percussion, dance, and performance are integrated in the development of cognitive and corporal aspects through rhythmic and neuromotor proposals (Fernández and Hochstätter, 2019; Naranjo and Cabrera, 2023). In addition to the methods, some didactic strategies, such as performative songs (Conde et al., 2010), storytelling narrative strategies (Yilmaz et al., 2018), and moving storytelling, integrate body, motor, and language skills enhancing musical comprehension and expression. In the professional musical environment, motor education is also valued with somatic learning methods such as the Feldenkrais method, which optimises body awareness through learning in movement in order to improve musical performance (Fiol et al., 2019).

Regarding the benefits of using movement in music class to the student, engaging the body in rhythmic movements, such as clapping, marching, walking, and jumping to music, can improve gross motor skills and develop a sense of rhythm (Srinivasan and Bhat, 2013). Through movement, the child trains spatial orientation as a skill that allows to evaluate the physical relationship between the body and the environment, and the modifications made during movement (Rigal, 2006; Retra, 2008). In addition, music and movement motivate children’s creative self-expression by engaging their senses, muscles, and intellect in motor performance. For the teacher, movement in music education is a teaching strategy that relates music and action, by stimulating a connection of the perceptual and motor processes with the predictive calculations of anticipation and adaptation of movement to music (Novembre and Keller, 2018). Classroom training of these skills supports the ability to coordinate individual movements with those of others in the context of ensemble musical performance, strengthening the integrative and social educational dimension.

Educational research should reflect the scientific advances in the use of music and movement as an artistic, musical purpose, or even as

an educational means or strategy. The lack of research and classification of the activity studied requires the organisation of evidence to improve knowledge, the area investigated, and the orientation of its pedagogy in future lines of research.

Once the study problem has been explained, we pose the following research questions: What is the research activity related to the educational use of music and movement in basic education? Is music and movement part of multimodal learning, or is their interaction reserved exclusively for musical learning? Given the need to classify different types of interaction that could be maintained by both practices, another research question would be: What areas identify the research activity of music and movement pedagogy in teacher training?

On the other hand, the establishment of links between musical and corporal practice and special education detected in recent years reinforces the evolution of these practices that promote equal educational opportunities. This orientation motivates other research questions: What fields have been studied that link musical and corporal practice and special education? What evidence obtained can be extrapolated to the whole population?

Reflection on these issues motivated the purpose of this study, which aims to analyse previous studies focused on the orientations and teaching implications of music and movement in basic and special education.

2 Method

2.1 Design

This study presents a retrospective observational analysis of research exploring pedagogy relating to music, movement, and learning in different stages of basic education. We use a systematic review as a methodology that analyses research studies on a particular topic (Villasís-Keever et al., 2019). We rely on a qualitative review to present the evidence in a descriptive way and share the available educational scientific evidence (Gairín and Ion, 2020) by understanding contexts, approaches, ways, and forms of approaching knowledge about music and movement education. Searching for studies on music and movement in education in a database required researchers an independent process of screening the documents. Next, researchers performed a criteria analysis of the evidence. Finally, the presentation of the evidence in a PRISMA-type flowchart (Page et al., 2021) allowed us to describe the process of study selection in its different phases, providing a report of the results with a presentation and summary of the characteristics and applicability of the studies.

2.2 Samples

The literature review enabled the selection of 29 articles from well-known scientific journals. These works included empirical research and critical analysis that provided scientific arguments about this study. To select them, the following inclusion criteria were used: articles published between 2013 and 2023; age spectrum from infancy to adolescence; observational studies; educational programmes; and works on teacher training and educational systems, all related to music and movement. The inclusion of articles involved a selection system that requires anonymous evaluators in a double-blind peer review

system as an effective and efficient mechanism to guarantee the quality, reliability, integrity, and consistency of the academic literature. Therefore, exclusion criteria included studies such as book chapters, conference room papers, books, revisions, conferences, and retracted and op-ed articles.

2.3 Process

The references in peer-reviewed literature were selected from the Scopus database, and the keywords were: music, movement, education, children, and the linking word (AND). The automated search was: article title, abstract, and keywords, to ensure all keywords from the studies were included. The results included 237 works spanning from 1973 to 2023. Selecting the works from 2013 to 2023 and applying the automated exclusion criteria resulted in 98 articles, with 139 being removed. By revising and analysing the abstracts of the pre-selected works, 69 studies that did not align with the study's objectives were excluded. The reasons for being excluded included: having health field-related experiences, lacking movement musical experiences, lacking a link between education and music and movement, lacking a pedagogical relationship, focusing on the elderly as the study sample, or using the term 'movement' in a different context, such as social movements. Eventually, 29 works were extracted to be assessed for eligibility, as presented on the PRISMA 2020 Flow Diagram (Figure 1).

The analysis of the studies included the following indicators: (a) country where the study was conducted; (b) authors and publication year; (c) objectives; (d) research methods and their designs: correlational, descriptive, and experimental; (e) sampling; (f) study variables; (g) instruments; and (h) main results.

Process of analysing the studies involved the following steps: (1) a specific and comparative study of the factors of each study: topic, purpose of the research, methodological design, variables, participants, context, and outcomes. The intervention was analysed, and a comparison and analysis of the results were made; (2) the factorial information was recorded in a template; (3) an affinity diagram was made for the visibility and grouping of the elements and studies; (4) then, the researchers met, discussed, and established a definitive grouping; (5) finally, categories and subcategories were named to facilitate their analysis and interpretation in the results section.

As a result of this analytical process, two main categories were determined: Category 1. Music and Movement Education: teacher training and intervention and Category 2. Movement Education in Special Education. Instructional perspective of studies in the first category differs from the humanistic perspective of studies in the second category, as well as the context of study (regular versus special education setting), the educational approach, and the teaching intervention.

Regarding Category 1, the thematic analysis included the following subcategories: teacher training in music and movement; music and movement methodology; music and movement in multimodal studies; teaching of music and movement through activities; and music and movement education assessment. The name of these subcategories has been determined by the respective fields of knowledge involved: the study of teaching skills for music and movement pedagogy; the study of music and movement methodology and its educational impact; multimodality for the improvement of musical understanding; analysis of music and movement activities in

different educational systems and evaluation of music and movement programmes.

For Category 2, the analysis included the following subcategories: music and movement education for self-awareness and personal development and teaching in music and movement for improved expression, communication, and social interaction. The classification is determined by the difference between studies that present programmes and experiences focused on the self-knowledge and personal development of students with SEN and those related to their social development.

3 Results

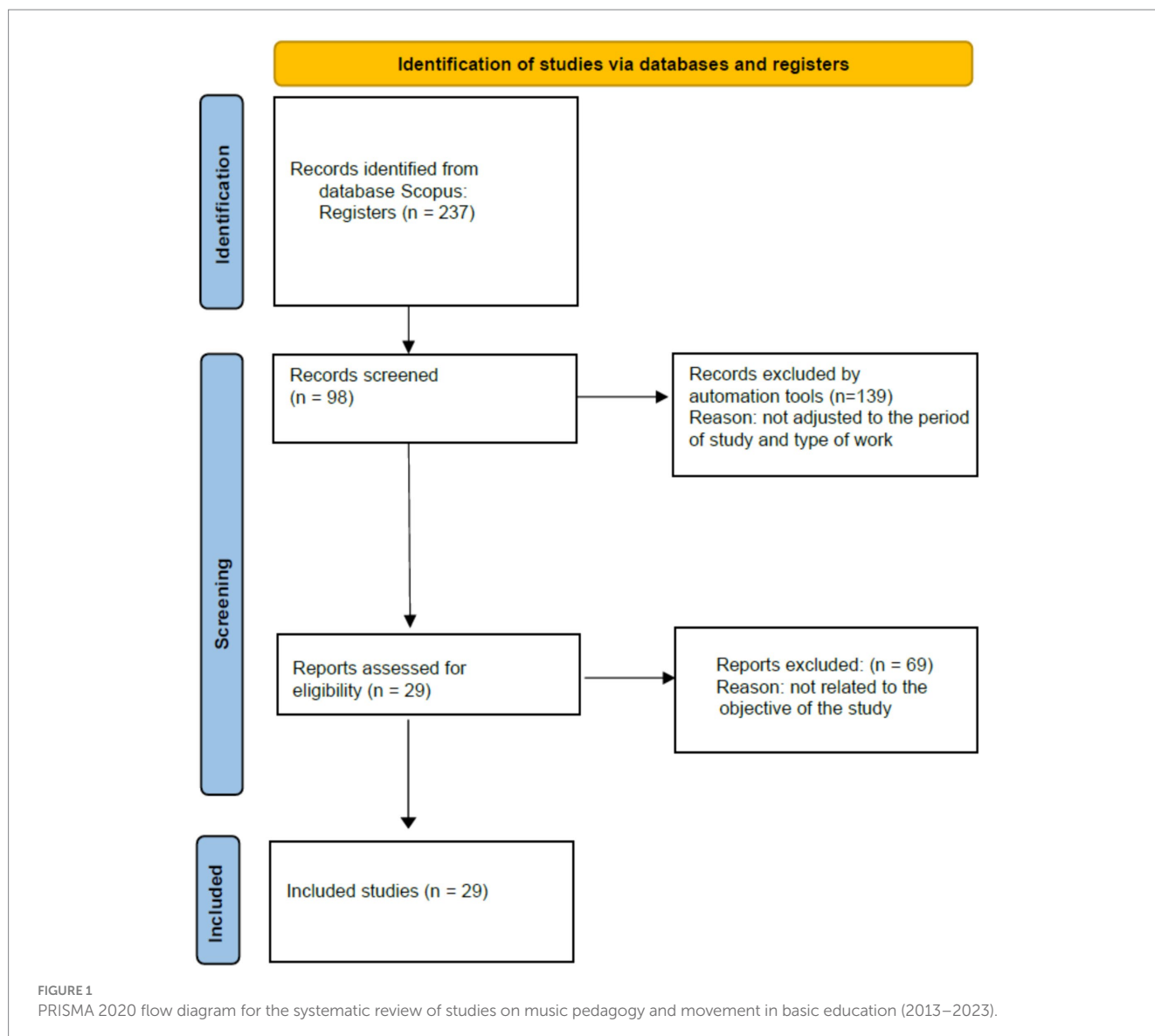
This section presents the analysis and interpretation of the 29 papers according to the established categories and subcategories.

3.1 Music and movement education: teacher training and intervention

The literature includes studies on the implementation of music and movement education, teacher training, and intervention required for its teaching (Table 1). The subcategories analysed were: teacher training in music and movement; music and movement methodology; music and movement in multimodal studies; teaching of music and movement through activities; and music and movement education assessment.

3.1.1 Teacher training in music and movement

Research on teacher training in music and movement includes studies that explore teacher's preparation for music and movement pedagogy (Augustine and Huey Yi, 2016; Bautista and Ho, 2022; Salvador et al., 2022; Williams et al., 2023). In this sense, Augustine and Huey Yi (2016) analysed three required elements for music and movement teaching: content knowledge, professional development, and instructional strategies. A questionnaire was administered to 48 non-specialised preschool teachers. The results (Likert scale of five points) were averaged into content knowledge ($M=3.35$) and instructional strategies in music class ($M=3.33$). 25% of teachers participated in courses, workshops, seminars, and other teacher development programmes. It was concluded that effective teaching requires confidence and active participation in professional development programmes. In this same line of study on teacher preparation, the study of Bautista and Ho (2022) examined how early childhood education teachers are trained in music and movement. In this study, 1,019 preschool teachers from Hong Kong were surveyed to assess their previous training experiences in music and movement, their perceived usefulness, their level of trust, and their self-perceived preparedness to teach music and movement. The comparison variables were the amount of teaching experience and the level of education. The results showed that 70% of teachers did not receive any basic or ongoing training in music and movement. The study demonstrated and extended the argument of how the lack of music and movement teacher training and experience had a negative impact on pedagogy. As a result, the authors concluded that there is a need to strengthen teacher training in music and movement, especially for new teachers.



Other qualitative and mixed studies have given depth to the interpretation of the results and critical capacity about the study and its teaching implications. [Salvador et al. \(2022\)](#) examined the beliefs of seven music educators on teaching and learning in the area. This study conducted a descriptive analysis and used hierarchical linear models (HLM) to analyse time-sampling data of teaching practices in elementary school classrooms. Teachers shared the belief that we live in a musical world, and the educators should build an educational environment where children develop their abilities in singing, playing, and dancing. Results showed how music and movement were limited to younger children, and HLM analysis provided predictive implications for the use of singing and movement as teaching strategies. Limiting music and movement education to younger children hinders the development of a pedagogy that reveals the dynamic contributions of music education and educational possibilities it provides for non-specialist teachers. In this sense, [Williams et al. \(2023\)](#) analysed the effectiveness of a teaching intervention with music and rhythmic movement performed by generalist preschool teachers. They used the Rhythm and Movement

for Self-Regulation (RAMSR) programme, attempting to improve self-regulation and executive function. A total of 213 children participated in the study. They were divided into two groups: an experimental group that followed a music and movement programme for 16–20 sessions over 8 weeks, and a control group that followed the usual programme. Variables of self-regulation and executive function were analysed through tasks and questionnaires. Results showed significant improvement in both over the first outcome. It became feasible for non-music educators to lead the music and movement programme. The studies found to share the need to integrate more teacher training in music and movement that prepares and motivates teachers to integrate it into their daily practice.

We note that research in music and movement teacher training is linked to the development of intrapersonal skills, such as self-regulation and performance, which facilitate their professional practice, and to the benefit of their pedagogical knowledge in the development of interpretative skills. This approach is relevant to the generalisation of music and movement teaching but requires competent analytical and expressive teacher training.

TABLE 1 Pedagogy.

Country	Author, Year	Objective	Method	Sample	Variable	Instruments	Main results
Australia	Williams et al. (2023)	To investigate the effectiveness of an intervention of generalist preschool teachers in the self-regulation and executive function of children through (RAMSR) musical programme.	ED	<i>N</i> = 213 preschool children and eight teachers	SR EF	Questionnaires and tasks	There were significant effects on self-regulation. Measurements and teacher reports show that it is feasible for educators without musical training to teach the programme.
China–Spain	Bautista et al. (2023)	To investigate in a comparative way the types of musical activities developed with preschool children from 3 to 6 years old in Spain and China.	DD	<i>N</i> = 398 teachers (199 from Spain and 199 from China)	MA	Questionnaire	Vocal, singing, and creative activities are worked more in China, and Rhythm and movement more in Spain. Repetitive practices are the most prevalent in both countries.
China	Li (2023)	To analyse the influence of interactive methods on the musical literacy of preschool university students using the Kodály method.	DD	<i>N</i> = 100 university students and <i>N</i> = 55 preschool children	IM	Erol Singer's Studio; movements in songs; Sing Sharp	Vocal and song production with movements were developed at a higher level thanks to interactive technology and knowledge assimilation.
Australia	White and Coyle (2023)	To investigate the educational contributions of an active music listening approach in the education of elementary school students.	DD	Primary school teachers	TP	Systematic observation	The use of a piece for flute, viola, and cello with Storyteller describes how educators can use music encouraging listening, movement, and play for comprehension.
United States	Salvador et al. (2022)	To examine music educators' beliefs about music teaching and learning associated with teaching practices in elementary classrooms.	DD	<i>N</i> = 7 primary school music teachers	TP	Interviews, hierarchical linear models (HLMs) of teaching	Analyses provided predictive implications for enhancing teachers' use of singing and movement.
Belgium	Fortuna and Nijs (2022)	To analyse how body movement qualities influence primary school children's perception and understanding of music.	ED	<i>N</i> = 34 children 9–10 years old	TP	Pre-post tasks, interview motor, visual (drawing) verbal analysis	Drawings and explanations offered insights into how movement qualities influenced sound representation. Multimodal interaction influenced musical understanding.
China	Ho and Bautista (2022)	To investigate the correspondence between music activities in the Quality Review (QR) reports of Chinese children's schools and curricular music objectives.	DD	<i>N</i> = 164 QR reports and official curriculum	MA CR	Documentary review	The musical segments focused on the development of singing, rhythm, pulse, movement, and instrumental music skills. There are no references to creativity and self-expression. Discrepancies between curriculum and classroom practices argued for a formative need for creativity.
Argentina	Porto et al. (2022)	To study how a service-learning experience in a rural multi-grade elementary school stimulates an inclusive educational environment and promotes English language learning.	ED	Primary school children (6–14 years old) from a native Mapuche community	TP	Systematic observation and field diary	Children engaged in multilingual, multimodal, creative, and inclusive forms of expression that combined their affective and semiotic resources through literature, music, movement, and creative arts.

(Continued)

TABLE 1 (Continued)

Country	Author, Year	Objective	Method	Sample	Variable	Instruments	Main results
China	Bautista and Ho (2022)	To analyse previous formative experiences in music and movement, usefulness, degree of confidence, and self-perceived readiness to teach music and movement.	DD	<i>N</i> = 1,019 Hong Kong nursery school teachers	TP	Questionnaire	70% of the participants did not receive training in music and movement.
Spain	Otero Mayer et al. (2021)	To analyse the teaching performance in the development of early childhood education activities, based on the observation of activities in classrooms from 0 to 3 years old.	DD	<i>N</i> = 340 early childhood education students and <i>N</i> = 58 teachers	MA	Observation Scale ITERS-3 (Infant/Toddler Environment Rating Scale)	The activities subscale does not reach the minimum level of quality in 8 of the 10 proposed items: fine motor skills, art, music and movement, blocks, and dramatic play.
Slovenia	Marinšek and Denac (2020)	To examine the influence of three educational programmes on the development of motor and rhythmic skills in early childhood education.	ED	<i>N</i> = 62 children 5–6 years old	TP	Tests of Gross Motor Development and Rhythmic Abilities tests	Music and movement are interrelated. Movement skills and rhythmic skills should be promoted in early childhood education in integrated programmes.
Indonesia	Mahayanti et al. (2020)	To find the philosophical basis of the linguistic education of a popular song and its motor relation.	DD	Preschool children	TP	Inferential content analysis method	Interpretation of the meaning of the song can only be understood by connecting verbal signs with non-verbal signs in the video.
South Africa	van Vreden (2019)	To analyse how to transmit jazz in a preschool center through spontaneous participation, inventiveness, and curiosity by means of the Bejazzled project.	DD	Preschool children	TP	Systematic observation	Spontaneous music making, motor response, exploration, and play provided jazz, cross-curricular, motor skills, auditory, language, social, and emotional developmental learnings.
China–Australia	Lau and Grieshaber (2018)	To analyse the presence of music, movement, creativity, and games in the integrated curriculum of a preschool center.	ED	<i>N</i> = 19 children 5–6 years old	TP	Systematic observation and interviews	It suggests ways in which kindergarten teachers could begin to incorporate more creative integrated approaches to music education.
Sweden	Tidén et al. (2017)	To analyse how “capacity” is conceptualised, configured, and produced in movement assessment tools.	DD	<i>N</i> = 10 movement assessment tools from six countries	RM	Descriptive analysis	Open-ended and creative skills, rhythmic movements to music, or flexibility tasks are absent from motor assessment tools.
United States	Jacobi, 2016	To explore the Dalcroze Rhythmic instructional method with Montoliu’s experience in Pennsylvania.	DD	Method analysis	TP	Descriptive analysis	The application of Montoliu’s Dalcroze method was a relevant experience for the American educational system.
United States	Matthews et al. (2016)	To analyse the rhythm pedagogy of a group of elementary school teachers.	DD	<i>N</i> = 16 primary school teachers	TP	Interviews	The teaching challenges to incorporate rhythm in pedagogy were personal and structural.
Malaysia	Augustine and Huey Yi (2016)	To investigate the fundamental components for the musical didactic preparation of preschool teachers.	DD	<i>N</i> = 48 preschool teachers	MA TP	Questionnaire	Teacher preparation in content and strategies was acceptable. 25% participated in teacher development activities and programmes.
Spain	Vicente-Nicolás and Mac Ruairc (2014)	To analyse the type of musical activities preferred by elementary school children.	DD	<i>N</i> = 4,700 primary school children and 20 teachers	MA	Questionnaire	There were significant differences between musical activities by gender.

Method: CD, correlational design; DD, descriptive design; ED, experimental design. Variables: EF, executive function; IM, interactive methods; MA, music activities; RM, rhythmic movement; SR, self-regulation; TP, teaching practices.

3.1.2 Music and movement methodology

Another set of studies focused on the rhythm and movement methodology (Jacobi, 2016; Matthews et al., 2016; van Vreden, 2019; Marinšek and Denac, 2020). The information from these studies seeks evidence of the educational value of rhythm and movement methodology and its understanding through different approaches. Matthews et al. (2016) analysed rhythm pedagogy amongst 16 primary school educators through an examination of experiences and the construction of the role of rhythm in class. The authors conducted qualitative interviews to probe a description of rhythm in the educational process. The results included the teacher's views on the meaning of rhythm and the importance and challenges of their teaching. They reflected the need to improve the academic curriculum by incorporating rhythmic activities, such as music, movement, and dance, for their educational and personal benefits.

In addition to the teaching implications, the skills associated with rhythm and movement methodology are integrated into the areas of cognition, perception, and corporal musical expression. In particular, the work of Jacobi (2016) analysed Montoliu's instructional approach, which sets rhythm as the basis of music learning in the child through aural and kinesthetic experiences in place of written notation alternatives. He created the condition of rhythm and an attitude of performing music in motion. The historical design delved into the basics of Dalcroze's Eurhythmics, being Montoliu, one of Dalcroze's first students who took and integrated his method in America, which involved listening, singing, reading, coordination, and response. In addition to coordination development and muscle control, it also cultivated artistic temperament, attention, effort, seriousness, concentration, and interest in Dalcroze's Eurhythmics amongst the students.

Regarding the Kodály vocal music method, Li (2023) analysed interactive methods and their influence on musical literacy training amongst university students pursuing a career in preschool education. This study involved 100 university students and 55 preschool children. They used observation, vocal performance, and soliloquy. The coefficient of effectiveness and the level of knowledge after the study established that 59% of preschoolers acquired a high level of knowledge with a 0.93 effectiveness parameter. Vocal production and song performances with movement and the Kodály method proved to be motivating experiences that enhanced learning, intonation, and song memorisation.

Although pedagogical tradition links rhythm and movement methodology to classical music, some studies have linked it to more contemporary musical styles. This new association integrated work not only on performative body skills, but also on the creative skills described by this music. Van Vreden (2019) examined the integration of jazz with the 'bejazzled' project and its teaching significance in preschool education through activities that stimulated spontaneity, inventiveness, openness, and curiosity for spontaneous music creation and motor response. The responses during the jazz learning process transcended musical boundaries and strengthened gross motor and listening skills and social and emotional development. Another study conducted by Marinšek and Denac (2020) analysed movement skills and rhythmic abilities in preschool education with three programmes: (1) Music and Movement, (2) Just Movement, and (3) Traditional Music Programme. The study included 62 children, ages 5–6, divided into an experimental group ($N=35$) and a control group ($N=27$), that

lasted 5 weeks. The Test of Gross Motor Development and Rhythmic abilities were used. They assessed the effects of the integration of movement in music education and the impact of music on movement performance. The results determined that a regular daily music programme was the most effective way to promote motor and rhythmic skills in preschool. Systematic personal training that links music and movement in a programme helps to develop auditory, motor, and expressive skills.

The inclusion of music and movement as methodological axes in this review provides the empirical evidence and the benefits obtained from the application of historical methodologies, such as Dalcroze and Kodaly, and the incorporation of consolidated and contemporary styles, such as jazz and body methodology, as a way of understanding and interpreting music.

3.1.3 Music and movement in multimodal studies

The bodily response evoked by listening to music in movement methodology has been collected in multimodal studies. Multimodal approaches that integrate musical and corporal practice are based on the intersection of common elements, such as the word that accompanies music, communication, representation, and dance, or the movement itself present in dance and the plastic arts (Mahayanti et al., 2020; Fortuna and Nijs, 2022; Li, 2023; White and Coyle, 2023).

Fortuna and Nijs (2022) investigated how different qualities of movement described the music and its understanding. The study participants were 34 children (aged 9–10), divided into two groups (control and experimental), who took part in listening and movement interpretation activities. As a pre-post test, children were invited to move freely to a piece of music, in addition to drawing a visual representation and explaining how the drawings and music were connected. The results showed how the movement influenced visual representations and how this strengthened music understanding in the analysis: music, movement, drawing, and language. Pedagogical contributions have identified multimodal interaction as a methodology strategy that enhances musical understanding. In another study, White and Coyle (2023) examined how educators used music from different cultures and genres with a multimodal approach (musical, literary, and corporal). They used the instrumental piece 'Cryptozoologica' (Jim Coyle) with Storyteller, and it stimulated physical, cognitive, and imaginative interactions amongst students, connecting music and movement with the narration of the story. The interrelationship—music, movement, and language—enhanced musical understanding and stimulated the follow-up of the story.

The impact of musical and bodily practice on the development of linguistic competence is also a subject of research in other multimodal studies related to learning lyrics. Mahayanti et al. (2020) analysed the philosophical foundations of language education in the lyrics of the 'Baby Shark' videos. They conducted an inferential content analysis to explore the connection between lyrics, movement, expression in the video, and background music. The linguistic analysis revealed the song required connecting verbal signs with non-verbal ones to be understood. Another socio-educational study (Porto et al., 2022) examined an inclusive service-learning experience amongst children in native Mapuche communities with intercultural literature activities in English (workshops, tours). The participants (children aged 6–14) from a rural multi-grade school in northern Argentinian Patagonia were led by university students and future English teachers. Engaging in multilingual forms of expression that combine literature, music

movement, and creative arts had a positive impact on their learning and inclusion.

The analysis of the multimodal studies found allows us to argue for multimodality as a pedagogical approach with experiences that bring music, movement, language, gesture, and corporal expression as a strategy that facilitates the development of learning. Its consideration is essential as a tool in school systems where inclusion and equity are fundamental educational principles.

3.1.4 Teaching of music and movement through activities

The study of the presence of music and movement activities in basic education has allowed to deepen into the needs of its curricular consideration and the methodological preparation of the teacher (Lau and Grieshaber, 2018; Otero Mayer et al., 2021; Ho and Bautista, 2022; Bautista et al., 2023). Otero Mayer et al. (2021) investigated teaching performance in classes with children aged 0–3 by examining the most frequent activities. They used a systematic review and the ITERS-3 scale (Infant/Toddler Environment Rating Scale, 3rd edition). A total of 340 students and 58 preschool teachers took part in this study. The results showed that the ‘Activity’ sub-scale had the lowest score. Some of the items with the lower quality were: fine motricity, art, music, movement, and drama games. The results urge us to rethink teacher training methods in preschool education. Additionally, Ho and Bautista (2022) examined the connection amongst music activities from 164 Quality Review reports from kindergarten teachers in China, along with the official curricular goals. They used deductive and inductive approaches, as well as the MAXQDA software for word frequency, descriptive, and co-occurrence analysis, with high levels of inter-reliability. The common activities were singing, rhythm, movement, and instrumental music. Creative and self-expressive activities were non-existent and there were discrepancies amongst curricular goals and in-class activities. Teaching implications emphasised the need for providing training in music practices to stimulate creativity. Although creativity is a difficult skill to assess, its stimulation and educational integration are essential for the development of understanding, autonomy, and musical and corporal expression. In this way, Lau and Grieshaber (2018) analysed the performance of a preschool teacher applying an integrated music approach that used movement and games to encourage learning and creativity. The participants were 19 children (ages 5–6) from a preschool class along with their teacher. The study was conducted in two separate stages, each consisting of four lessons. The non-participant observation, the pictures, and the interview showed the teacher’s pedagogical progress in the integrated approach and the fostering of music creativity. As it has been proven, learning motivation, autonomy, and creativity support the main characteristics of this methodology.

Research on the type and frequency of in-class music activities can improve teaching practices, student preparation, methodological orientation, and the identity of education systems. Bautista et al. (2023) investigated in-class music activities with preschool children (aged 3–6) from Spain and China. A survey was conducted amongst 398 preschool teachers, 199 from Spain and 199 from China, to determine the frequency of performance from 19 different types of music activities. These activities were categorised based on their content (type) and nature (potential of the activity to foster creativity). China focused more on singing and voice activities, while Spain

focused more on rhythmic movement. There were more reproductive activities than creative ones performed in both countries. Mismatches were found amongst curricular goals and actual classroom practices, suggesting the need to revise both the curriculum and teacher training methods. In another study, Vicente-Nicolás and Mac Ruairc (2014) analysed the favourite music in-class activities of 4,700 primary school children. These activities were classified into singing, playing instruments, listening, reading and writing music, and movement/dance. The results revealed significant differences in preferred activities by gender, with girls preferring movement and dance activities.

We detected that music and movement activities are called by different names, including the words rhythm, movement, rhythmic movement, or dance, with different criteria. This reveals the need to establish and regulate a standardised nomenclature of movement in education that allows a better classification of activities.

3.1.5 Music and movement education assessment

Music and movement education is an ordinary educational activity. The lack of studies on movement assessment may influence the analysis and development of its teaching. Only Tidén et al. (2017) analysed how ‘ability’ is conceptualised, configured, and produced through 10 assessment tools across six countries. This research explored the types of motor abilities measured by each tool. The evaluated movements were related to traditional sports and physical activity. Nonetheless, open skills, rhythmic movements related to music, and activities with more flexibility were non-existent.

The analysis of music and movement activities allows the comparison of international curricula, pedagogical correlation, methodologies, and the need to increase evaluative research on music and movement education to improve its recognition and strengthen teacher training.

3.2 Teaching with music and movement in special education

Musical learning in Special Education encourages personal work on basic needs such as motor development, self-control, self-regulation, social learning, and self-expression. Analysis of the studies found involves a classification of works according to the study subcategories: Music and movement education for self-awareness and personal development and teaching in music and movement for improved expression, communication, and social interaction (Table 2).

3.2.1 Music and movement education for self-awareness and personal development

The relation of perception and rhythmic expression through the body in movement harbours an educational training that connects the child with his or her own corporeality, stimulating motor, cognitive, and emotional development. This basic educational contribution for all students acquires particular interest in students with special educational needs (SEN) through research, programmes, methods, and experiences. Motor awareness and self-regulation in music education were studied with the execution of Lithuanian folk awakening games working with children with special needs (Zvicevičienė and Aleksienė, 2015). The study

TABLE 2 Special education.

Country	Author, Year	Objective	Method	Sample	Variable	Instruments	Main results
Slovenia	Plavčak (2022)	To analyse how art and movement influence social learning.	CD	Primary school children with ID	SL	Observation, Field diary	Art stimulated new modes of expression. It is therapeutic and improves safety, empathy, and social learning.
China	Xia and Li (2022)	To analyse how music teaching can help children with autism.	ED	<i>N</i> = 3 children with ASD 5–6 years old	A SC MD	Observation, questionnaires	Attention, motor imitation, rhythmic, cooperation, and behaviours were improved.
Netherlands	Bremmer et al. (2021)	To explore a multimodal approach to teaching music to students with disabilities.	DD	Children 4–18 years old with severe or multiple disabilities	A MD	Interviews	Multimodal approach facilitated musical understanding and expression. It is suggested to review Schmid's model (2015).
England	Moula et al. (2021)	To investigate the educational processes and outcomes of an art therapy intervention.	ED	<i>N</i> = 64 children with emotional, behavioural difficulties	W	Questionnaires Interviews	Results validated the processes implemented in the pilot trial to be applied to a larger trial.
United States	Hogle (2021)	To analyse the intersubjectivity in the social learning of a child with ASD in a choral group.	ED	<i>N</i> = 1 Primary school child with ASD	SL	Observation, Field diary	Autonomy, empathy, and understanding through movement contributed to group musical agency.
Australia	Williams et al. (2020)	To analyse the RAMSR programme in the cognitive and motor development of children in disadvantaged environments.	DD	<i>N</i> = 237 children 3–5 years old and eight teachers	SR MD EF	Observation, teaching meeting	Self-regulation, emotional, attentional, behavioural, executive functioning, and self-efficacy were improved.
Korea	Jang (2020)	To analyse how self-expression through art and movement affects self-efficacy.	ED	<i>N</i> = 20 primary school children with ID	A SR SE	Observation, Analysis SPSS	Movement impacts confidence, vocal self-expression, and influences self-efficacy and task preference.
United States	Cook and Rapp, 2020	To evaluate musical teaching interventions in the reduction of stereotypy in children with ASD.	ED	<i>N</i> = 5 children with ASD	SR	Observation, Field diary	Standard instruction and intervention with continuous music and movement decreased stereotypy and increased correct responding.
Brazil	Boas et al. (2016)	To analyse attention and interaction process of a child with congenital deafblindness.	ED	<i>N</i> = 1 deaf-blind child	A SL SE	Observation, recordings	Attention to the teacher in rhythm activities, vocalisation, emotional expression, and access to the world were improved
Lithuania	Zvicevičienė and Aleksienė (2015)	To analyse the educational possibilities of awakening games in children with SEN.	DD	Children with SEN	A MD SE	Interpretive analysis	Games improved imitation, motor creativity, self-expression, language, and self-esteem.

Variables: A, attention; EF, executive functioning; MD, motor development; SC, self-control; SE, self-expression; SL, social learning; SR, self-regulation; W, welfare.

describes these folkloric games as easy to dance with low-volume songs and movement. Familiarity of this popular musical repertoire facilitates its educational use. These games are considered educational and therapeutic, stimulating motor, communicative, and emotional abilities, including self-fulfilment and self-esteem. The cultural and self-formative values of this programme made it ideal for teachers and professionals in Special Education linking family and school learning as a resource for stimulating learner confidence in learning.

Ensuring student motivation in learning is a challenge of teaching. The studies of music and movement education in Special Education involve therapeutic methods to ensure the well-being, confidence, and motivation of students in physical, cognitive, and emotional learning environments. Williams et al. (2020) examined the effectiveness of a music education and therapy programme called Rhythm and Movement for Self-Regulation (RAMSR) on self-regulation and motor development amongst preschool children from disadvantaged communities. The study involved 237 children from eight kindergartens with daily sessions for 8 weeks. The intervention included: observation and reflection and followed Hemmeter's protocol based on the analysis of social-emotional competence in early childhood. Results demonstrated improvements in self-regulation including emotional, attentional, and general classroom regulation, as well as assessed behavioural regulation and executive functioning. Additionally, school readiness was enhanced in terms of learning competency self-efficacy, as well as rhythm and movement. In this line, Xia and Li (2022) also analysed three music teaching methods with three preschool children (aged 5–6) with autism spectrum disorder (ASD). Musical teaching activities enhanced attention, movement and rhythm imitation, cooperation ability, and teaching goals. The behavioural analysis showed an improvement in musical abilities and rule awareness and reduced inappropriate behaviours and negative emotions. These studies show how movement and rhythm help children to improve learning by focusing their activity, increasing their attention time, and managing their behaviour. In this line, another study investigated teaching interventions aimed at decreasing stereotypy and increasing correct responses during academic instructions for five children diagnosed with ASD (Cook and Rapp, 2020). Case studies included actions between standard instruction and the adapted educational intervention. For two of the participants, stereotypy decreased when the instructors used standard practices and interventions with continuous music and movement, improving appropriate responses. It shows that music and movement practices can strengthen certain cognitive and bodily areas of work that are not impaired by stimulating personal self-efficacy.

3.2.2 Teaching music and movement for improving expression, communication, and social interaction

The correlation—music, rhythm, and movement—as a means of non-verbal communication can enhance autonomy, expression, and social interaction in children with SEN. Boas et al. (2016) examined the patterns and interactions of a child with deafblindness and a specialised teacher. They used systematic observation and audiovisual recordings. The child paid attention to the teacher during the activities that included music and rhythm. Music and rhythm improved the child's vocalisation, touch, body contact, body movements, facial

expressions, and emotion. The teacher who acted as a communication partner helped identify and interpret attention and communicative behaviours. Music, rhythm, and movement were used as a form of communication that eased understanding, sharing information, and access to the world.

In this sense, Jang (2020) studied self-expression from the movement perspective in intellectually disabled children and the way it affects their self-efficacy. The experimental group participated in an integrated movement and dance programme (for 12 months), while the control group participated in a music, art, and physical education class. Children who participated in the movement programme improved their confidence in self-expression contents ($t = 3.087$, $p < 0.01$), voice self-expression ($t = 2.766$, $p < 0.01$), self-efficacy ($t = 3.940$, $p < 0.001$), and preference for a task ($t = 4.057$, $p < 0.001$). Self-expression encouragement in intellectually disabled children through movement increased self-efficacy, which suggests the need for a multifaceted study. A multifaceted study that is practically applicable in the field of special education is needed. All these studies have shown how systematic rhythmic activity in Special Education enhances corporeality and autonomy, overcomes blockages and difficulties, and improves corporal expressive development and communication.

The possibilities of multimodal methods for improving comprehension and expression include consideration of experiences that enhance their educational use as a facilitating resource. The multimodal effect in music teaching in pupils with severe or multiple disabilities (aged 4–18) was studied by Bremmer et al. (2021). With a multiple-case-studies design, the approach combined music, tactile stimulation, movement, and visuals, trying to encourage a significant understanding of music. Three music teachers and a social worker participated in this study. The data were analysed using Schmid's framework of 'multimodal dimensions of children's music experiences': narrativity, sociality, materiality, and embodiment. The results argued Schmid's framework revision and its adaptation for special education as a tool to design multimodal music lessons. In this line, Moula et al. (2021) investigated the well-being, quality of life, and sleep of 64 elementary school children with emotional and behavioural difficulties using an intervention programme with verbal and motor art therapies. They used questionnaires, interviews, participant observations, artwork, and biomarkers. Positive results in the reconduction of behavioural disorders confirmed the pilot trial to be ready for a larger trial.

The benefits of musical expression in self-awareness and improved self-expression are also reflected in social development, as Hogle's (2021) study analysed how intersubjective or shared understanding of a music learner with ASD in a choir setting affected his musical learning abilities. The study suggested an educational relationship between the child and younger children through musical games, which allowed him to gain enough trust to do it with the entire ensemble. The display of musical agency through physical movement during the music-making process stimulated his understanding and autonomy. Musical relationships with his peers fostered affectionate, inclusive experiences. Building an inclusive learning space with motor and creative activities encouraged understanding, agency, and empathy. Similarly, Plavčák (2022) analysed the influence of movement in drama and role-playing activities to encourage social learning in moderate intellectually disabled children. This form of collective expression fostered trust, contentment, opportunities to

build relationships, and improved empathy and communication amongst these students.

Therapy demonstrates in this review psychosocial evidence on the implementation of programmes using music and movement. This allows therapeutic approaches to be incorporated into educational research as educational approaches for the improvement of inclusion.

4 Discussion

This study aimed to analyse the state-of-the-art music and movement education research between 2013 and 2023. Although there is not a large scientific production, the studies we have found in 16 countries have China (20.6%), the United States (17.2%), and Australia (10.3%) at the top of scientific output. Research on children's musical and motor education is crucial for understanding and improving their psycho-pedagogical development and orienting teacher training methods towards a more integrative approach.

In line with the research questions, this section discusses research activity on music and movement education and teacher training needed to respond to basic and special education students as an inclusive educational strategy.

4.1 Music and movement education and teaching training

The connection between music and movement can be of a different nature according to the context and the objective of the research. It might be an unrelated connection aimed at working on specific abilities and functions; a related connection, such as movement-based musical education or rhythmic motor education where there is reciprocal feedback in the exercise; or an alternative connection with an interdisciplinary approach that integrates knowledge from various fields that correlate to specific concepts, skills, and specific values.

Some research shows weaknesses in the type of activity assessed due to a lack of conceptual and pedagogical concreteness of the bodily activity used. For example, the use of movement accompanying the performance of songs in some research (Linnavalli et al., 2018; Mahayanti et al., 2020; Porto et al., 2022) needs a specification of the type of bodily performance implemented. This lack weakens the boundaries of the use of movement and its understanding as motor activity, gestural activity, rhythmic activity, dance, or performative activity without concreteness. The advancement of research in music and movement education requires a terminological specification of body terminology that delimits the use and evaluation of musical body activity in the different fields of intervention.

Regarding the investigation stage, the research activity focuses to a greater extent on the use of music and movement as a channel for comprehensive education in the preschool stage. There is a need for more research activity in other stages of basic education, specifically primary and secondary education and deepen its educational, corporal, expressive, communicative, and social possibilities.

In preschool, music is often taught by teachers without a background in music. Their study involves the analysis of teachers' disciplinary knowledge and instructional strategies (Augustine and

Huey Yi, 2016), as well as teachers' disposition and preparation to identify instructional needs (Bautista and Ho, 2022). Music and movement education in elementary education includes a dynamic and creative strategy that encourages student participation in experiences that involve auditory, motor, and cognitive skills (Jo Pogue, 2018). This correlation favours the meaning of learning with the integration of different languages, channels, and resources in musical expression fostering learning. Thus, motor music education has an inclusive educational dimension that favours learning, autonomy, and musical interpretation of the student as a whole and respects the pace of individual learning, involving teacher care and student well-being in learning. In this sense, the concern for self-care and personal well-being drives its integration into education and art therapy studies. Music and movement education in teaching training implies that the teacher designs and presents educational proposals where listening and expression are natural, uninhibited, sensitive, and caring activities (Matthews et al., 2016; Marinšek and Denac, 2020). The teacher's attitude is fundamental to encourage students to interpret music in movement with respect, trust, and confidence.

Regarding teaching training, music, and movement education requires adequate pedagogical training and guidance in teaching methods. The curricular and cross-curricular contributions of rhythm and movement to music's understanding and expression with a dynamic approach (Fortuna and Nijs, 2020a,b, 2022; Lau and Grieshaber, 2018; White and Coyle, 2023) and the challenges posed by its teaching (Matthews et al., 2016) all confirm the need to include rhythmic methods, such as the Dalcroze approach (Jacobi, 2016), in educational curricula and training programmes (Bautista et al., 2023) as pedagogical approaches and tools for professional development. Institutional documents should include a section on methodological guidelines for music and movement education to guide teachers in teaching practice.

In teacher training, the implementation of active teaching strategies such as simulation (Medina-Díaz and Verdejo-Carrion, 2020) as a technique that allows gathering information about learning can be a very useful pedagogical tool. The creation of real or fictitious musical motor situations that occur in a context for which the teacher is being trained allows them to experiment and simulate their professional work, favouring collaborative learning in an open and inclusive educational approach (Vidal et al., 2019; Angelini, 2021). In addition to collaborative action, reflection in action and debate (Vásquez-González et al., 2017) are strategies that can enrich teachers' dialogical and critical capacity. Thus, it is necessary to incorporate new active methodologies of music and movement education that familiarise future teachers with their professional implications.

In the field of research, the advancement of music education in movement requires the creation and development of research that provide evidence on the suitability of the interaction of the elements that structure music and movement and how these specific relationships contribute to musical learning and understanding. More generally, one of the fundamental challenges for the future of music and movement education research is to identify the focus, purpose, and intrinsic relationship to design effective training and intervention methods in areas that can range from education and psychoeducation to re-education and improving quality of life (Jo Pogue, 2018; Koch et al., 2019; Del Barrio and Arús, 2020; Jang, 2020).

4.2 Music and movement education for inclusion

An humanised approach to music education is gaining ground as an inclusive education trend, focusing on the students and their well-being and incorporating arts therapies as psychoeducational strategies (Moula et al. (2021)). Diversity of students in the classroom requires musical teaching approaches that stimulate personal development while respecting learning rhythms in inclusive experiences. Artistic, musical, and corporal expression through movement/dance encourage activity, self-knowledge, and self-realisation relating to music and action (Novembre and Keller, 2018) by promoting the expressive dimension and motivation in learning. In addition to the personal contributions provided by movement, dance can also stimulate creativity, social well-being, and inclusion of students in a cross-cultural environment due to creative dance initiatives that are defined as strategies to support personal and cultural identity (Dhillon and Ulmer, 2022). From a social perspective, movement and dance facilitate the bodily expression of the music, integrating all students in the same experience.

After all, dynamic experiences—music and movement—provide multiple benefits. On one hand, they make music learning accessible to all students, and on the other hand, they allow them to work on the basic and specific needs of students with disabilities, making it a significant cross-domain experience. When it comes to music learning, multimodal approaches (Bremmer et al., 2021; Li, 2023; White and Coyle, 2023) use different ways of representing music (bodily, visually, or verbally) to achieve understanding and expression. As a teaching measure, education with music and movement encourages the development of physical skills and motor functions related to movement control and non-motor functions related to cognition, motor memory, learning, and motivation (Zvicevičienė and Aleksienė, 2015; Boas et al., 2016; Xia and Li, 2022). It also helps regulate improper behaviours while improving the right responses from children with expressive needs (Cook and Rapp, 2020).

Music and movement education promotes the creation of experiential learning environments that contribute to the development of autonomy and confidence of students with greater difficulties in expression, communication, and relationships, encouraging self-expression and self-efficacy (Habron and Bachmann, 2016; Jang, 2020). Integrating the motor expression of music as a routine activity can promote body control, increased attention and concentration time, as well as improved expression and communication. Within the affective domain, this relationship stimulates emotional self-control amongst students with disabilities who learn together as a group (Williams et al., 2020), while fostering socio-emotional abilities, such as empathy, communication, social learning, and peer musical agency (Hogle, 2021; Plavčák, 2022). Music and movement education is an experience that favours social learning because it involves the community. This integrative experience is especially indicated to motivate the participation and learning of students with educational needs with their peers (Hidalgo and Schön, 2016).

This study recognises how preschoolers seek a comprehensive education that promotes movement-based music education involving language, psychomotor, and social skills. Research determines that these interactions contribute to the ability to listen, speak, and express themselves motorally. Children develop values such as respect, kindness, and responsibility (Öztürk and Can, 2020) while reinforcing

their artistic development through communicative skills in collective bodily musical experiences in the classroom (Hidalgo and Schön, 2016).

4.3 Limitations

This research has faced some limitations, like the difficulty in finding information on certain analysis indicators in some of the works. Similarly, not all studies had a scientific background. Some of the more informative articles were selected, as their goals, methods, and results offered relevant information that could strengthen and build new research lines in the music and movement education fields.

4.4 Conclusion

Music and motor education needs an increase and organisation of evidence to guide educational research and improve teaching. The use of movement in music education simplifies and improves the musical teaching and learning process by stimulating understanding and expression in different ways, which makes it a dynamic and integrating pedagogical approach. This approach needs further research to test the impact of possible relationships between elements that structure musical discourse and bodily organisation. This impact may not be exclusively educational at the musical level but may also have an impact on other areas, such as the psychosocial sphere. It is proven that how music and movement can interact, at an educational stage, in a dependent or independent way in processes derived from the approach of artistic and non-artistic objectives. Their multiple interactions are currently in need of greater definition and classification in order to facilitate the opening of new lines of research. A greater presence of research in early childhood education limits a broader interpretation of the educational possibilities and benefits it can have at later stages.

This study establishes a framework for an empirical and pedagogical review of research on music and movement pedagogy in basic education. Scientific evidence requires making the relationship between music and movement visible, as in some research in early childhood education, movement is integrated into the musical activity itself. However, in multimodal studies, music and movement share independent relationships with other practices, with objectives ranging from the development of linguistic competence to the development of creativity.

In the context of special education, movement is treated explicitly and with relevance, involving the child's connection with his or her corporeality in order to stimulate motor, emotional, and cognitive development. The improvement of well-being, confidence, and motivation are therapeutic objectives to be achieved thanks to musical and corporal practice, which can be extrapolated to a large part of the population. In this sense, it is noted that including the review of research framed in the therapeutic field can provide significant evidence for basic education and its inclusive dimension.

The teacher, as the guide of the educational process, needs knowledge and training to integrate music and movement education in his or her professional practice. Their training involves preparation to improve attention to diversity, where multimodal activities can be a great resource. We need to investigate, define, and frame the possible

relationships between music and movement in both the artistic and educational dimensions. We also need further research in music and movement education to reinforce the argument of the expressive and creative potentialities and the need to establish adequate teacher training that favours its application. Finally, scientific and educational evidence calls for the integration of programme evaluation and the creation of evaluation instruments that analyse the efficiency of music and movement education.

The study of music and movement education opens a wide field for future psychoeducational research with defined and categorised research lines that deepen the educational contributions and their impact on the child's cognitive, creative, expressive, emotional, and social development. Its definition and development are crucial for the progress and challenges of corporal and music education research.

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

LB: Conceptualization, Data curation, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration,

Resources, Software, Supervision, Validation, Visualization, Writing – original draft, Writing – review & editing. EA: Conceptualization, Formal analysis, Funding acquisition, Investigation, Methodology, Project administration, Resources, Supervision, Validation, Visualization, Writing – original draft, Writing – review & 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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