Original Article

Dance therapy in aging: A systematic review

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Abstract:

Aging is a natural process that encompasses physical, cognitive, emotional, and social issues. Dancetherapy is a physical activity that can deeply influence all these aspects in elderly individuals. Previous studies have focused on the elderly population with diagnosed diseases such as: Alzheimer's, Parkinson's, dementia, depression, and cardiac disorders, among others. The scientific gap identified was the lack of eligible studies investigatingdance therapy practice in healthy elderly people. A systematic review of the literature was conducted to identify and analyze studies that evaluated the physical, cognitive, psychoemotional, and social benefits of dance therapy in healthy elderly people. To do this, a search was performed on the PubMed, Scopus and VHL databases, on July 10, 2018 using the descriptors “dance therapy,”“aged,”“aging,”and “elderly.” There were 2,334 studies, out of which 6 were chosen. Considering the multidimensionality and complexity of the phenomenon of aging, the results of this review allow the conclusion that dance therapy is a highly relevant intervention that demonstrates benefits in physical, psychoemotional, and social aspects. These benefits improved functional autonomy and existential renovation. It is suggested that future studies investigate the effectiveness of dance therapy as a potential tool for anactive and healthy aging process.

Key Words: Dance Therapy, Aged, Aging, Elderly

Introduction

With the growth of the elderly population in Brazil and in the world (IBGE, 2018), the theme of aging, in a multidimensional perspective, has been gaining relevance in different areas of knowledge. The aging process, natural, progressive and irreversible, represents the level of adaptability and functionality of the individual in the face of biological rhythms, diseases and socio-environmental influences (Spiriduso, 2005). Among the factors that have helped people to live longer are highlighted: disease prevention, health care, and more effective treatment of certain age-related diseases (McArdle, W. Katch, F. Katch, V., 2016). With this, there are variousdebates about the process of active and successful aging.

Actively aging means maintaining the ability to perform activities or functions with diverse abilities to care for oneselfand one's environment. Examples include bathing, dressing, eating, taking medications, interacting socially, getting around, shopping, cooking, managing finances, and participating in leisure activities (Duarte, Andrade, Lebrão, 2007). The World Health Organization advocates the development of long-term care systems with integrated multidimensional understanding and monitoring as a priority area that can assist in ahealthy aging process, far from curative models based on disease (WHO-Brazil, 2018). Thus, successful aging requires the maintenance of improved physiological functions and physical fitness since, for those reaching an advanced age, reduced cardiovascular function, low muscle strength and poor movement amplitudes, as well as sleep disorders and emotional states, are directly related to functional limitations (McArdle et al., 2016).

In order to achieve anactive and successful aging process, research and activities on aging should focus not only on prolonging life expectancy but also on improving the breadth of health and the aspectsof living conditions (Spiriduso, 2005). One of the tools that can contribute to this process is the practice of regular physical exercise (McArdle et al., 2016). In addition to influencing functional autonomy, regular exercise also influences the psychological well-being of the elderly by promoting feelings of self-efficacy, well-being, self-esteem, and reduced risk of depression and anxiety in the aging process (Shephard , 2003).

The practice of dance therapy can be effective in maintaining the functionality and autonomy of the elderly, as well as in psychoemotional health through self-awareness and stabilization of cognitive functions (Kshtriya, et al., 2015). Dance therapy is considered a non-performing and non-choreographed dance experience. According to Fux (2011), there are no rules;ideas are varied and should be adequate to the diverse possibilities of exploring and accomplishing tasks with dance. This practice encompasses not only physical exercise, but also the ability to learn, attention, memorization, rhythmic motor coordination, visual-spatial ability, improvisation of

movements through music, imagination, emotion, and social interaction (Kshtriya, et al., 2015). In addition, social contact and positive leisure experiences performed in a group setting prevent the isolation of the elderly and can be integrated with other health treatments (Brauninger, 2014).

Previous literature reviews have pointed out benefits of dance therapy for the elderly of different clinical populations. Sharp and Hewitt (2014) evaluated elderly people with Parkinson's disease and demonstrated clinically significant benefits with short-term dance therapy. Lyons, Karkou, Roe, Meekums and Richards (2008) considered the practice of dance therapy a pleasant and empowering experience that helps elderly people with dementia create connections between physical sensations and feelings. The study by Neto, Menezes and Carvalho (2014) in patients with chronic heart failure observed that dance therapy can improve peak VO₂ and health-related quality of life and can be considered for inclusion in cardiac rehabilitation programs.

Considering the predominance of review studies that investigated dance therapy for the elderly with already diagnosed degenerative diseases, the objective of the present study was to identify, through a systematic review, research that evaluated the effects of dance therapy on healthy elderly people.

Materials & Methods

A systematic review of the literature was carried out, following the PRISMA methodology (Moher et al., 2009), through an electronic search of indexed articles in three databases (PubMed, Scopus and BVS - Virtual Health Library). In order to include a representative number of scientific publications, the authors of the present review chose to use the crossword index terms in the Health Sciences Descriptors (DeCS) and/or Medical Subject Headings (MeSH) of PubMed through the Boolean operator AND: "dance therapy" AND "aged," "dance therapy" AND "aging," and "dance therapy" AND "elderly." Only one search was performed in each database, on July 10, 2018, using only English terms, since a greater number of articles were found in this language.

Regarding filters, it was decided to limit the entry "article types" field to only "journal articles," and in "publication dates" it was decided not to specify any period of publication. A document was created for each database based on the searches performed containing the titles and authors of all references found. The first step in the exclusion criteria was to identify and eliminate duplicate articles. The additional exclusion criteria were: a) articles that did not directly address the study subjects of the present study (individuals over 60 years of age); b) articles related to dance but with intervention in the elderly with diseases diagnosed as Alzheimer's, Parkinson's, dementia, cancer, multiple sclerosis, heart diseases, diabetes, obesity, depression, insomnia, fibromyalgia, anxiety disorders, and autism, among others; c) articles related to institutionalized elderly subjects, d) articles that were not physical activity, and e) review articles and meta-analyses.

After the studies were found using the criteria above, they were selected by two independent researchers. In the possession of the texts in full, the articles were read in detail, which made it possible to extract some information categorized as follows:

- 1) author (year);
- 2) country;
- 3) sample characteristics;
- 4) stipulated protocol of dance;
- 5) dance type;
- 6) Method;
- 7) assessment instrument.

Subsequently, an analysis and interpretation of each selected study's results was performed. These were organized and discussed in a comprehensive category: Relationship of dance therapy with sensorimotor/cognitive, psychoemotional, and social performance in healthy elderly.

Results

In total, 2334 studies were found following the proposed search methodology. Table 1 shows the number of articles identified in each database from the combination of keywords:

Table 1. Number of articles found in each database.

Search	Scopus	PubMed	BVS	Total
"dance therapy" AND "aged"	187	326	830	1343
"dance therapy" AND "aging"	34	54	49	137
"dance therapy" AND "elderly"	61	329	464	854
Total	282	709	1343	2334

Source: Self-made

Despite the high number of publications initially found, after using the exclusion criteria, 6 articles were included in the analysis (Figure 1).

Figure 1.Elaboration following PRISMA methodology.

It is worth noting that among the studies analyzed there was an expressive proof of the efficacy of dance therapy for the elderly in relation to the following: balance and activities of daily living (ADLs)(Berbel, Silva, 2015);Quality of Life (Oliveira, Pivoto, Vianna, 2009); psychological well-being (D'Alencar, Mendes, Jorge, Guimarães, 2008); freedom and autonomy in aging (D'Alencar, Mendes, Jorge, Rodrigues, 2006);cognition, intelligence, attention, reaction time, tactile, postural and motor performance, as well as subjective well-being and cardiorespiratory performance (Kattenstroth, Kalisch, Holt, Tegenthoff, Dinse, 2013); and improvedbalance and reducedfall risk(Mierzwa, Długosz, Marchewka, Dąbrowski, Poznańska, 2016).

Table 2. Description of the studies included in the systematic review.

Author (Year)	Country	Sample	Stipulated protocol of dance	Dance Type	Method	Assessment Instrument
Berbel, Silva (2015)	Brazil	♂ = 4 ♀ = 21 Range: 60-85 years	2hours/week 12 weeks	Senior Dance	Quantitative Longitudinal	Lawton Instrumental Activities of Daily Living Scale and and Berg Balance Scale
Oliveira, Pivoto, Vianna (2009)	Brazil	♂ = 12 ♀ = 91 Range: 70-75 years	1hour/ week 16 weeks	Senior Dance	Quantitative Longitudinal	Short Form Health Survey-36 (SF-36) Berg Balance Scale
D'Alencar, Mendes, Jorge, Guimarães (2008)	Brazil	♂ = 1 ♀ = 7	1hour/week 32 weeks	Biodanza	Qualitative Transversal	Semi-structured Interviews Participant Observations
D'Alencar, Mendes, Jorge,Rodrigues (2006)	Brazil	♂ = 1 ♀ = 7	1hour/week 32 weeks	Biodanza	Qualitative Transversal	Interview
Kattenstroth, Kalisch, Holt, Tegenthoff,	Germany	IG: ♂ = 8; ♀ = 17 Range 66-70	1hour/week 24 weeks	Agilando ^T _M	Quantitative Transversal	Everyday Competence Questionnaire, Instrumental

Dinse (2013)		years CG: ♂ = 3 ♀ = 7 Range 70-74 years				Activities of Daily Living, Standardized Questionnaire, Paper-and-pencil non-verbal geriatric concentration test, Frankfurt Attention Inventory, Repeatable Battery of Neuropsychological Status, Non-Verbal Learning Test, Raven Standard Progressive Matrices, Reaction Time Analysis, Posture and Balance. Hand-arm Fine-motor performance. Cardio-pulmonary Performance.
Mierzwa, Długosz, Marchewka, Dąbrowski, Poznańska (2016)	Poland	♀ = 24 Range 61-74 years	2.4 hrs/week 12 weeks	Dance Therapy	Quantitative Longitudinal	"Postural Stability Test," "Limits of Stability Test," and the "Fall Risk Test."

Note: ♂= men; ♀= women; IG=Intervention Group; CG=Control group.

Discussion

Given the remarkable change in the world's demographic profile, the population is achieving greater longevity. This fact has stimulated research on the influence of motivating and enjoyable physical exercises on the maintaining functional capacities and mental-emotional health of the elderly and has also expanded the understanding about life expectancy coupled with quality of life, which has been characterized as successful aging. The objective of the present review was to analyze the bibliographic production about the benefits of dance therapy in healthy elderly people. This emphasizes the relevance of this literature review for the special attention that active and successful aging should receive from health professionals who deal with the elderly.

With regard to the type of dance covered in the studies, it was possible to observe that the authors adopted different dance nomenclatures/methodologies. The following were mentioned: Senior Dance (Berbel, Silva, 2015; Oliveira, Pivoto, Vianna, 2009); Biodanza (D'Alencar, Mendes, Jorge, Guimarães, 2008; D'Alencar, Mendes, Jorge, Rodrigues, 2006); Agilando™ (Kattenstroth, Kalisch, Holt, Tegenthoff, Dinse, 2013); and dancetherapy (Mierzwa, Długosz, Marchewka, Dąbrowski, Poznańska, 2016). Senior Dance is a socio-psycho-emotional physical activity program created by Ilse Tutt in Germany in 1974. It emerged amid therapeutic resources as a preventative strategy of inactivity in order to delay senility and promote quality of life among the elderly. It is based on folk songs and nursery rhymes of different cultures, laterality and low-impact play, specially adapted to the possibilities and needs of the elderly individual. The exercises are carried out in a circle, standing or sitting upright, increasing flexibility, range of articular motion, and agility (Carvalho, 2012). Biodanza, however, has its immediate relevance in life; it is defined as a system of integration, development and existential renovation, oriented to the expression and study of physical and psychoemotional potentialities, induced by music and dance through group corporal communication exercises and integrative experiences (Toro, 1991). Agilando™ is a Latin mode characterized by sequences of fun and relaxing dance exercises of increasing complexity. One characteristic of this dance mode is that it can be performed alone (Kattenstroth, Kalisch, Holt, Tegenthoff, Dinse, 2013). Dancetherapy, according to the American Dance Therapy Association (2019), is the therapeutic use of movement as a process leading to emotional and physical balance of a person. This means that dance therapy is multifaceted and affects the physical and mental spheres (Kozłowska, 2002). Considering the conceptualizations presented for each dance nomenclature/methodology, it is understood that they all have in common the development of both physical appearance and psycho-emotional and social aspects through dance.

As for the country where the studies were performed, Brazil stands out with 4 publications, followed by Germany and Poland, each with one publication. However, when relating such publications with the dance type of each study, an interesting fact arises. Although Agilando™ is considered a Latin type of dance, its study was carried out in Germany. On the other hand, Senior Dance, originally created in Germany, was analyzed in two Brazilian studies. Such a fact demonstrates the dissemination of these different dance types and their insertion in different social environments.

Regarding the characteristics of the subjects included in the research, there was great variability in age range, ranging from 60 to 85 years of age, and a large proportion of the studies evaluated younger individuals, with a cap of 75 years of age. The number of participants was 29.83, considering the sample mean of the 6 studies. In addition, a predominance of female participants was observed in all the studies analyzed (in 6

studies total 150 women and 29 men). This predominance can be explained by several factors. The first one stems from women's longer life expectancy compared to men (IBGE, 2018). Average expectancy reaches 79.4 years for women and 72.2 for men (IBGE, 2018). Additionally, the very characteristic inherent to the type of physical activity analyzed is emphasized: dance. Assis and Saraiva (2013) make a research on masculine and feminine roles and their representation in dance. The authors point out that historically, there has been an alternation between power images of men and women dancing. However, at various points throughout history there has been female predominance.

As for the stipulated dance protocol, 4 studies applied a weekly intervention of 60 minutes, with the duration ranging from 16 to 32 weeks. Another study adopted a protocol of 2 weekly classes of 60 minutes for 12 weeks (Berbel, Silva, 2015). The last study, however, prescribed 3 weekly classes of 45 minutes for 12 weeks (Mierzwa et al., 2016). This information can be interpreted regarding the level of physical activity they provide to the subjects. Matsudo et al. (2001) observed that in order to be considered physically active, the individual must perform at least 30 minutes, 5 days a week, of at least moderate-intensity physical activity.

The data of the protocols adopted by 4 studies analyzed in this review (Oliveira, Pivoto, Vianna, 2009; D'Alencar, Mendes, Jorge, Guimarães, 2008; D'Alencar, Mendes, Jorge, Rodrigues, 2006; Kattenstroth, Kalisch, Tegenthoff, Dinse, 2013) are sufficient only to classify the elderly as irregularly active. It is suggested that the protocols applied in the elderly be at least 5 times a week, with a minimum duration of 30 minutes per session with moderate intensity, in order to contribute to the classification of these individuals as physically active.

Regarding research methods, it was possible to observe that the studies focused on quantitative delineation ($n = 4$; 66.6%) and only 2 studies adopted the qualitative method (33.3%). As for the temporal design, there was a balance between the longitudinal ($n = 3$ studies; 50%) and transversal ($n = 3$ studies; 50%) methods. As for the adopted instruments, it was verified that in those studies in which the qualitative method was employed, the semi-structured interview was adopted. In contrast, in the quantitative studies, several validated questionnaires and tests were used. Given this similarity between the methods adopted, it is understood that both methods safeguard their importance in the scientific context presenting different views of a given phenomenon, seeking to understand or quantify it.

The main results found in the articles were discussed below. It was sought to highlight the main aspects identified by the studies. Among them are physical attributes, reduction of fall risk, independence in performing activities of daily living, psycho-emotional and social well-being aspects, and internal and individual existential aspects.

Dance therapy in healthy elderly people and its aspects

Initially, it was perceived that all the studies analyzed mentioned physical attributes. Kattenstroth et al. (2013) observed that the indicators of cardiorespiratory performance did not show change with dance intervention. It is noteworthy that the protocol adopted by the authors was once a week. As mentioned by Matsudo et al. (2001), in order for physical activity to be sufficient to characterize the individual as physically active, at least 150 minutes per week of at least moderate intensity physical activity are required. In contrast, the same authors (Kattenstroth et al., 2013) demonstrated a significant increase in physical-motor, tactile, and postural parameters and cognitive-sensory parameters covering intelligence, attention, and reaction time. Similarly, Berbel and Silva (2015) identified that dancing had positive effects on the mobility, strength and coordination of the elderly. Complementing this idea, Mierzwa et al. (2016) showed a significant improvement in spinal rotation and body-weight transfer strategies through ankle movements. In addition, in the study by Oliveira et al. (2009), the participants presented greater physical disposition and pleasure in performing the movements and reported less fatigue and greater energy, always requesting more time to practice Senior Dance. This study detected improvement in laterality, spatial orientation, and body awareness. According to D'Alencar et al. (2008), the reports revealed an increase in physical capacity and the feeling of still being "strong" and a decrease in complaints. In addition, D'Alencar et al. (2006) noted that physical progress was related to a strong mobilization for the elderly to leave home. Therefore, it is understood that physical attributes were quite expressive for the analyzed studies, contemplating a range of improved physical attributes.

Fall risk was mentioned in three of the studies covered by the present review. Berbel and Silva (2015) observed that the fall rate decreased starting when balance and skill in position changes, and also in stability, were maintained or acquired by the Senior Dance practitioners. The results of the study by Mierzwa et al. (2016) showed a significant improvement in the indicators of balance skills and stability limits, which correlates strongly with a decrease in fall risk. In the same sense, Kattenstroth et al. (2013) found improvement in posture and balance. Therefore, strong evidence of improved balance, stability, and decreased risk of falls were observed in the studies analyzed, which have a positive impact on the independence and performance of ADLs, given the natural decline in performance related to aging.

Regarding functional capacity and autonomy, it is known that during the aging process biochemical, functional and psychological changes are associated with a reduction in functional capacity for ADLs and a consequent reduction of independence and autonomy of the elderly, making them more vulnerable to pathological processes (Figliolino et al., 2009). This attribute was mentioned by four out of the six studies of the

present review, therefore making it another important aspect. Berbel and Silva (2015) found a significant increase in independence after practicing Senior Dance and better performance in the proper functions used to develop gestures and ADLs. The authors also noted that those who had previous falls moved less due to fear or insecurity. The practice of Senior Dance provided the elderly with improved balance, dexterity and stability, which was satisfactorily related to the executive functions of ADLs. Oliveira et al. (2009) also found smaller indicators of physical limitations in performing ADLs. The results of these authors were representative in the sense that the group studied had no other intervention during the period in which they participated in the weekly group of Senior Dance. A similar result was observed by D'Alencar et al. (2006) in the study on the practice of Biodanza, where they could verify in the interviews via the participants' accounts the meaning of biodiversity as a source of freedom and autonomy. In addition, Mierzwa et al. (2016) verified that with the improved stability and balance provided by dance therapy, elderly individuals were able to perform ADLs more effectively, which gave them more autonomy, safety, and a higher quality of life. Therefore, although the practice of Senior Dance does not discontinue the natural process of biological aging, can reduce its impact on performance and effectiveness in daily activities.

With regard to the study of psycho-emotional traits, the World Health Organization (2018) defines mental health as something more than the absence of mental disorders, including subjective well-being, perceived self-efficacy, autonomy, competence, and self-realization of one's intellectual and emotional potential. In the present review, four studies have also emphasized this feature. Oliveira et al. (2009) found that this aspect had the greatest positive impact with the practice of Senior Dance. Participants achieved a 58% improvement in indicators of short-term memory, attention, and concentration, decreased indicators of anxiety, depression, behavioral changes, and emotional unrest, and also increased psychological well-being: therefore, mental health and condition were strengthened. A major influential factor in the improvement of the psycho-emotional attributes of the elderly were cheerful and lively songs, with melodies that reminded them of the nursery rhymes of their childhood, which revived in them a musical memory (Oliveira et al., 2009). D'Alencar et al. (2008 and 2006), in two studies selected for the present review, found in participant accounts increased liveliness, happiness and will to live, feelings of peace, tranquility, feelings of lightness and freedom, and decreased insecurity and shyness. In addition, Kattenstroth et al. (2013) showed that intervention with dance therapy showed positive effects such as improved cognition, attention, and subjective well-being. This makes evident the relevance given in studies on dance therapy by combining psychological and emotional benefits in the face of the natural and progressive loss of certain cognitive and sensorimotor abilities in the elderly.

The social aspect, analyzed with the intervention of dance therapy, was observed in three articles covered by the present review. Oliveira et al. (2009) found a significant increase in all indicators related to well-being and socialization, such as more willingness to participate in other social activities, happiness, and motivation in the face of new friendships stemming from the meetings. The combination of music, movement, and sociality in Senior Dance brought relaxation, heightened awareness of emotional balance, and encouragement in performing everyday tasks. The movements stimulated the elderly in a playful and interpersonal way, promoting affectivity and a sense of belonging. The study by D'Alencar et al. (2008) also found that with Biodanza intervention, the elderly reported a greater motivation for participating in and attending social events, which, per the participants' own accounts, removed them from isolation and encouraged them to live more happily, as well as engendering feelings of adjustment and adaptation to their surroundings. Another study by these same authors (D'Alencar et al., 2006) showed that Biodanza promoted integration and bonding with others and promoted a sense of belonging and conviviality, especially when touching and being touched during practices. Solidarity, the joy of living and the good feeling of being in the company of others was evidenced and reinforced. Thus, the expressive relevance of dance therapy is demonstrated via the opening of multiple opportunities for social interaction among the elderly, which is directly reflected in the quality of life of this population.

From the point of view of existential renovation of the self, Oliveira et al. (2009) observed that the elderly of the evaluated group signaled a better perception of themselves and their potential, feeling more expressive, active, and interested in everyday tasks. On top of this, D'Alencar et al. (2008) found that the practice of Biodanza lay in an impulse for existential renovation and internal processes of self-observation and self-knowledge, as the elderly found themselves physically and mentally changed and having strengthened identities. In the interviews, a sense of revival of life and of oneself and the rediscovery of the pleasure of living were evidenced, with Biodanza as a path to them (D'Alencar et al., 2008). In the study by D'Alencar et al. (2006) a metamorphic process was verified through participant accounts: older people left the restriction of their cocoons of social repression to which they were subjected throughout their existence, they blossomed and freed themselves from shame, fear and prejudices, and discovered the possibility of self-expression, with greater acceptance of their bodies and all their functions and body image having been modified by aging. In this sense, it was identified that Biodanza promotes existential renovation in the elderly and openness to the possibility of re-creating their existence with the changes that inevitably accompany old age.

Dance therapy is a potentially relevant intervention in physical activity because it is multifaceted and acts on the sensorimotor, cognitive and psycho-emotional, and social aspects of the elderly, which can be classified as a motivational factor for continued physical activity. However, the present review cannot be exempt

from some potential limitations, such as the homogeneity of the groups of participants regarding socioeconomic conditions, age, and gender, so that it becomes possible to study and compare the practice of dance therapy at different stages of aging. It is suggested that future research investigate the efficacy of this intervention as a potential quality of life tool for the population during the aging process, including elderly people of different age groups, especially the oldest group, when motor skills generally decrease markedly.

Conclusions

Considering the multidimensionality and complexity of the phenomenon of aging, the results of the present review allow the conclusion that dance therapy is a highly relevant intervention that demonstrates benefits in physical, psychoemotional, and social aspects. These benefits have brought about improved functional autonomy, existential renovation and self-knowledge, a sense of self-efficacy, creative potential, re-socialization and belonging, and the creation of lasting bonds for coping with progressive age-related degenerative processes. Dance therapy promotes leisure, happiness, increased liveliness, and satisfaction with life.

Given these findings, dance therapy demonstrates a highly appropriate choice of intervention to stimulate plasticity processes, improve age-related deterioration, and thus contribute to successful aging. Health care professionals involved in the care of elderly individuals should whenever possible consider the feasibility of associating dance therapy as a stimulating and therapeutic activity. Therefore, the elderly can benefit from practicing dance therapy, and it may constitute a relevant resource to help improve their quality of life. It is an activity fully acceptable and adapted to the capabilities of the elderly, combining music with physical activity, making it attractive for the practice of physical exercises within this population. The development of long-term health care systems with integrated multidimensional monitoring can aid in an active and successful aging process, far from disease-based models (WHO, 2018).

Conflicts of interest – Authors declare no conflicts of interests.

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