

Article

Effects of Line Dancing on Mental Health in Seniors after COVID-19 Pandemic

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Abstract: Line dancing is one of the most practiced dance styles by adults and seniors due to the ease of execution of choreography. Due to the COVID-19 pandemic prolonging the restrictions of physical and sports activities, the elderly population has been forced into increased sedentariness and social isolation, resulting in the development of symptoms of depression. The aim of this study was to investigate the effects of line dancing practice on the mental state of late second- and third-age dancers. The sample consisted of 14 Italian female dancers with an average age of 65 years old. The Geriatric Depression Scale was used to verify whether 3 months of LD classes were able to produce improvements. Paired Samples *T*-Test and effect size were performed to test the difference between pre- and post-training protocol. The result was statistically significant ($p < 0.05$). Dancers improved their state of depression; in particular, they felt a better satisfaction in their life ($d = 0.6$), a greater interest in activities ($d = 1$), less boredom ($d = 0.8$), a good mood most of the time ($d = 0.8$), greater happiness throughout the day ($d = 0.7$), and the perception of a wonderful life ($d = 0.5$). Line dancing has proven to be an effective physical activity for improving the state of depression in late second- and third-age dancers.

Keywords: aging; inclusion; depression; well-being; socialization

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1. Introduction

Line dancing (LD) is a type of training dance in which all participants perform the same choreography in a synchronized mood, moving along one or more lines. Since 1995, the Italian Dance Sport Federation (FIDS) has recognized it as an amateur category, and today, it falls under the social dance category. The competitive version is called the choreographic team [1]. LD was born in a spontaneous way, from the need to make all those who did not have a partner, but who cultivated a passion for music and body movement, dance. The choreography can be prepared to music coming from a couples' dance, such as Latin American dances, Caribbean dances, Standard, or it can be created to special music. The current trend is to mount a specific choreography on each hit of the moment, and the dance usually takes the name of the piece of music to which it refers [1]. Each season, a series of choreographies are then prepared that are accessible to everyone.

In many parts of the world, older people participate in LD. It is one of the most recommended activities to the elderly by their primary care physician, physician assistants, nurses, and other professional figures, to keep them physically active. In fact, they play a key role in motivating elderly patients, advising them about their physical limitations, and suggesting enjoyable activities [2]. Regular exercise was shown to reduce age-related mortality and morbidity in the elderly [3,4]. It is very important to investigate the relationship between physical activity and aging, a phenomenon that mainly concerns the Western world, particularly Italy. According to Italian National Institute of Statistics (ISTAT) projections, in around 50 years, one in three Italians (30%) will be 65 years or older, and one in 10 will be 85 years or older [5]. This is because there is a continued reduction in mortality and a decline in births. However, because of excess mortality due

to COVID-19, the latest ISTAT data show a slight reduction in average life expectancy of minus 1.3 years for men and minus 1 year for women, with a retreat of about 10 years in life expectancy levels [5]. According to projections by the National Institute of Statistics (ISTAT), in about 50 years, one Italian in three (30%) will be 65 or older, and one in 10 will be 85 or older [5]. Globally, according to the World Health Organization (WHO), by 2050, 2 billion people will be 60 years of age or older, compared to 1 billion in 2020 [6]. The aging population presents a challenge for fitness and sports instructors because they must try to engage the older population as much as possible to ensure healthy and active aging. The majority of the elderly population does not satisfy the physical activity levels recommended by the World Health Organization (WHO). The WHO's 2016–2025 strategy recommends the same levels of physical activity for those over 65 as recommended for adults 18–64, with the addition of balance, mobility, and strength exercises [7]. As the population of seniors increases, therefore it will become vital for family physicians to advise sedentary patients to become physically active. According to various studies, dancing for the elderly provides numerous benefits [8,9]. On a physical level, dancing involves greater control of the muscles due to the variations in timing and rhythm of choreography steps and an improvement in joint ROM given by the extensive movements that affect the entire body. Good mobility is fundamental to the elderly person's daily life, as it allows them to perform the tasks of daily living and have greater independence. Muscles and joints in good condition protect bone health to prevent osteoporosis. At the cardiovascular level, constant movement oxygenates the blood, improving cardiorespiratory function and preventing atherosclerosis [10]. Those who dance often have an interest in keeping fit to improve their performance and appearance; consequently, they will be incentivized to eat healthy foods, thus preventing metabolic diseases [11]. Memorizing choreography implies that the mind and body are coordinated and always active, working on cognitive function [12]. Finally, there is the improvement in mood provided by socialization with peers and music. In fact, the results of a study [13] showed that the practice of LD resulted in high involvement, active and successful aging, health and well-being, social connection, and purposeful leisure time.

Various studies highlight that the onset of depression in old age is increasingly common, especially in women [14,15]. The WHO defines depression as one of the four giants of geriatrics [16]. From Silver Steps—an Italian public health surveillance system that collects information on health and behavioral risk factors related to the onset or complications of chronic non-communicable diseases on the Italian population over 65 years old, including levels of physical activity, to describe the quality of life and the needs for care and assistance of elderly, with a new look at the phenomenon of healthy and active aging (WHO)—interesting data emerged during the four-year period 2016–2019. It was estimated that 13 out of 100 over-65s suffer from depressive symptoms [17]. The most common causes may be due to retirement, restriction of a circle of friends, isolation, presence of illness, and stress. Social isolation is a predictor of mortality on par with smoking, high blood pressure, obesity, and high cholesterol [18]. In particular, the COVID-19 pandemic, with physical and sports activities restrictions, has forced the entire population into social isolation [19,20], worsening the situation for the elderly [21]. Constant exposure to high levels of stress, such as those caused by COVID-19 among the elderly, in fact, can lead to depression, causing mental health problems [22]. Several studies have shown acute stress disorder, post-traumatic stress disorder, and an increased propensity to experience anxiety and insomnia states in the days immediately following the end of isolation [23,24]. Separation from relationships, therefore, may put adults and older adults at greater risk for depression and anxiety [25].

For this reason, during the recovery towards normality, it is even more important to involve the elderly in socializing activities, such as LD. It is also recommended to propose programs that can meet the basic movement needs of the special population, taking into account the new regulations due to the pandemic [26,27]. Several studies have shown that exercise can result in decreased depression status in the elderly [28,29].

However, more research is needed to support the arguments about the effectiveness of LD to improve the mental state of the elderly. The aim of the present study was to analyze the depression status of late second- and third-age dancers following the resumption of activities previously limited by COVID-19 and to verify if three months of taking an LD course were able to improve their mental health status. It is important to prevent the risk of depression, as this pathology negatively affects the quality of life, making it difficult to perform most of the Activities of Daily Living (ADL), which represent a substrate of fundamental skills for the elderly and whose loss of autonomy in performing even one of them is considered a disabling condition [30].

2. Methods

2.1. Design and Participants

The present study was designed to describe the characteristics of 14 Italian female dancers of the late second and third ages (age, Mean \pm standard deviation [SD] = 65 \pm 5.29 years old) randomly selected from a dance studio, using cluster analysis. All the participants already attended the same dance studio, but due to pandemic restrictions, they had not danced for about a year and a half. None of them performed any activities at home. Inclusion criteria were: age over 50 years, absence of conditions that impair physical activity, and GDS score greater than 5. Three participants did not meet the requirements and were excluded from the study, even though they participated in the dance classes. None of them took antidepressant medicines. Informed consent was obtained from the participants, and the data were treated anonymously.

2.2. Training Protocol

A dance-training program was applied to the participants three days a week for 3 months. Each lesson had a duration of 60/65 min and was divided into warm-up with a duration of 15 min, a central phase for 35/40 min, and a cool down for 10 min. The warm-up phase consisted of mobility exercises starting from the neck, shoulders, pelvis, knees, and ankles. Next, a series of technique exercises were proposed to improve the style and execution of choreography. These exercises consisted of performing the basic steps of some Latin American dances, such as jive, samba, cha-cha, and rumba, and Caribbean dances, such as mambo, bachata, salsa, and merengue. After gradually increasing the body temperature to prevent the risk of injury and prepare the body for work, they moved on to the middle phase. The central phase consisted of the explanation of an LD, the music of which came from one of the hits of the moment. The choreography was divided into sequences, explained without music, and repeated first at a slow speed and then with music. A standard division of a choreography included: first block, second block, chorus (all \times 2), third block or bridge, chorus, and final. All sequences could be performed in one, two, three, or four walls or in the diagonals. Finally, cool down consisted of passive stretching and breathing exercises, with relaxing music in the background.

2.3. Data Collection

In order to evaluate the effect of dance training on depression of the elderly, we applied the 15-item Geriatric Depression Scale [31], a tool for measuring depression in older adults, developed from the original 30-item by Yesavage et al., [32]. The score ranged from zero to 15: a score of zero to five indicated a normal range, six to nine indicated possible depression, and a score from ten to fifteen indicated probable presence of depression. The questionnaire was composed of 15 items to which it was necessary to answer "yes" or "no". Questions 1, 5, 7, 11, and 13 were scored zero for "yes" and one for "no", while the remaining questions were scored inversely, as shown in Table 1. This form can be completed in approximately 5 to 7 min. Participants received the paper questionnaire on the first day of class, explaining that they wanted to assess their mental state. It was specified that completion would take a few minutes and that it would be repeated three months later, at the end of the summer dance class, to see if the responses would change over time. This would provide a clear

picture of the subjects' depression status. None of the participants evaded completing the questionnaire.

Table 1. GDS.

	Item	Yes	No
1.	Are you fundamentally satisfied with your life?	0	1
2.	Have you given up many activities and interests?	1	0
3.	Do you feel that your life is empty?	1	0
4.	Are you often bored?	1	0
5.	Are you in a good mood most of the time?	0	1
6.	Are you afraid something bad is going to happen to you?	1	0
7.	Do you feel happy most of the time?	0	1
8.	Do you often feel unable to respond?	1	0
9.	Would you rather stay home than go out and do new things?	1	0
10.	Do you think you have more memory problems than most people?	1	0
11.	Do you think life is wonderful now?	0	1
12.	Do you think the way you feel now is rather worthless?	1	0
13.	Do you feel energized?	0	1
14.	Do you feel that your situation is hopeless?	1	0
15.	Do you think that most people are better off than you are?	1	0

2.4. Statistical Analysis

Descriptive statistics were used to summarize participants' responses. A statistical Shapiro–Wilk test was performed to verify if the dependent variable was normally distributed and Levene's test to determine the homogeneity of variance. A Paired Samples *T*-Test was performed to determine significant differences over time for each dependent variable. The effect size (ES), which allows comparison between each item, was interpreted according to Cohen's *d* index [33] as ignored ($0.00 \leq ES < 0.20$), small ($0.20 \leq ES < 0.50$), moderate ($0.50 \leq ES < 0.80$), large ($0.80 \leq ES < 1.30$), and a very large effect ($1.30 \leq ES$). Statistical significance was set at $p < 0.05$. Data analysis was performed using the Statistical Package for Social Science software (IBM SPSS Statistics for Windows, version 25.0. Armonk, NY, USA).

3. Results

A detailed description of the participants' GDS scale scores obtained before and after the three-month group dance course is shown in Table 2, while their ranking according to the GDS Index is shown in Table 3.

A statistically significant result emerged comparing pre- and post-intervention depression status scores ($t = 9,602$; $p < 0.05$). A detailed description is shown in Table 4.

Cohen's *d* showed that Item 2, 4, and 5 had a large effect ($ES = 0.8$ – 1); Item 1, 7, and 11 had a moderate effect ($ES = 0.5$ – 0.7); Item 3, 9, and 13 had a small effect ($ES = 0.2$ – 0.3); and Item 6, 8, 10, 12, 14, and 15 had an ignored effect ($ES = -0.1$ – 0.1). A detailed description is shown in Table 5.

Table 2. Pre- and post-intervention GDS score.

Cases	Score Pre	Score Post
Dancer 1	8	6
Dancer 2	10	7
Dancer 3	8	6
Dancer 4	7	5
Dancer 5	9	6
Dancer 6	14	10
Dancer 7	8	4
Dancer 8	8	6
Dancer 9	12	7
Dancer 10	11	6
Dancer 11	8	5
Dancer 12	11	9
Dancer 13	7	5
Dancer 14	9	7

Table 3. GDS Index.

	Range	Pre	Post
Possible presence of depression	10–15 points	5	1
Possible depression	6–9 points	9	9
Improbable depression	0–5 points	0	4

Table 4. Paired Samples *T*-Test between pre- and post-GDS scores.

		Paired Differences				t	gl	Sign. (Two Tails)	
	Mean	Standard Deviation	Standard Error of Mean	95% Confidence Interval of Difference					
				Lower	Upper				
GDS	Pre-post	2.92857	1.14114	0.30498	2.26970	3.58745	9.602	13	0.000

Table 5. Comparison of each item between pre- and post-intervention using Means \pm SD and effect size (ES).

GDS Item		Mean \pm SD		Cohen's d	
		Pre	Post	D Value	Effect Size (ES)
1.	Are you fundamentally satisfied with your life?	0.8 \pm 0.3	0.5 \pm 0.5	0.6	Moderate
2.	Have you given up many activities and interests?	1 \pm 0	0.4 \pm 0.5	1	Large
3.	Do you feel that your life is empty?	0.4 \pm 0.5	0.2 \pm 0.4	0.2	Small
4.	Are you often bored?	1 \pm 0	0.5 \pm 0.5	0.8	Large
5.	Are you in a good mood most of the time?	0.8 \pm 0.3	0.4 \pm 0.5	0.8	Large
6.	Are you afraid something bad is going to happen to you?	0.2 \pm 0.4	0.3 \pm 0.4	-0.1	Ignored
7.	Do you feel happy most of the time?	0.7 \pm 0.4	0.5 \pm 0.4	0.7	Moderate
8.	Do you often feel unable to respond?	0.7 \pm 0.4	0.6 \pm 0.4	0.1	Ignored
9.	Would you rather stay home than go out and do new things?	0.1 \pm 0.3	0	0.3	Small
10.	Do you think you have more memory problems than most people?	0.5 \pm 0.5	0.5 \pm 0.5	0	Ignored
11.	Do you think life is wonderful now?	0.7 \pm 0.4	0.5 \pm 0.5	0.5	Moderate
12.	Do you think the way you feel now is rather worthless?	0.3 \pm 0.4	0.3 \pm 0.4	0	Ignored
13.	Do you feel energized?	0.3 \pm 0.4	0.2 \pm 0.4	0.3	Small
14.	Do you feel that your situation is hopeless?	0.3 \pm 0.4	0.2 \pm 0.4	0.1	Ignored
15.	Do you think that most people are better off than you are?	0.8 \pm 0.3	0.8 \pm 0.3	0	Ignored

4. Discussion

This study aimed to examine the effects of LD on depression in the late second and third ages. Results showed that 3 months of the LD course was able to reduce participants' depression status. All participants improved their GDS scale scores. Before returning to dance, whose suspension of classes was due to the COVID-19 pandemic, dancers had negative feelings. In fact, they were not satisfied with their lives (Item 1), had lost interest in various activities (Item 2), were bored most of the time (Item 4), were in a bad mood all day (Item 5), and had the perception that the rest of the people were better off (Item 15), as shown in Table 5. In the beginning, there were five dancers who scored between 10 and 15, which implied that depressive symptoms were likely present, while nine others were between the 6 and 9 range, thus with the possible presence of depression. Therefore, most of the dancers showed depressive symptoms. During the 3-month intervention, participants attended the LD course three times a week, which allowed them to improve not only their physical condition but also their social and mental condition especially. By resuming attendance with their dancing mates, all subjects reduced their depressive state. In particular, only one person was at risk for depression despite having an improved GDS score. The other nine, however, were located near the minimum value of the central range, while four dancers were in the 0–5 range. Some aspects addressed in the questionnaire had greater improvements than others. Specifically, dancers experienced greater satisfaction and improvement in their lives (Item 1), greater interest in activities (Item 2), less boredom (Item 4), good mood most of the time (Item 5), greater happiness throughout the day (Item 7), and the perception of a wonderful life (Item 11). Interestingly, most dancers felt quite energetic both pre- and post-intervention (Item 13) and preferred to go out rather than stay indoors (Item 9). This aspect was very important because if they had felt lacking in energy and preferred to stay indoors, they most likely would not have agreed to want to start a dance class. According to other studies [34,35], dance helped to develop positive feelings. One aspect that did not change was the perception of having more memory problems than other people. Most likely, this response could have been influenced by the activity performed. LD requires a lot of memory, and very often, some steps are forgotten. Several studies showed that dance-based exercise could reduce the number of depressive symptoms [28–37]. The first study [28] showed that 12 weeks of dance training decreased levels of depression in college students compared to the control group. The second one [36] showed the effects of a dance intervention twice a week for 12 weeks on depression, physical function, and disability in older adults, and again there had been a significant improvement in the depression status of the older adults. Finally, in the third case [37], dance-based exercises were performed once a week for 60 min for 3 months, and this reduced the number of depressive symptoms in nursing home residents. Moreover, in our case, LD appeared to improve dancers' mood levels and reduced stress levels due to the social and physical benefits of the activity [38]. The impact of LD clearly goes beyond the perceived physical benefits [9]. According to this study [9], line dancing was an effective method of stress relief in women over 60, who, during an interview, felt physical, psychological, and social benefits from this practice because, unlike other activities, it was fun and immersive. Interest in the health benefits of leisure activities is increasing, especially for seniors. The more active a person is, the lower their self-reported depressive symptoms are [39].

With the COVID-19 pandemic consequences, combined with the classic problems of the elderly, mental health wellness has become a major concern. The COVID-19 pandemic has had a negative impact on older adults' well-being. About one in five respondents said their overall mental health has declined since the pandemic began [40]. In order to improve their mental state, it is important to establish routines, set goals, stay physically active, and most importantly, maintain social connections with friends and family.

The study has some limitations, such as the small sample size and the absence of a control group. Although larger samples with long-term programs are recommended, our pilot data suggest that group dances have a positive effect in reducing depression in

older adults. Future research could consider involving a control group and perhaps extend the intervention period to see the long-term effects. This study has sensible implications for instructors and physicians who are tasked with recommending activities designed to promote the well-being of older adults and to try to engage them in activities that act on not only the physical but also the social and mental spheres. According to a study, failures to increase population levels of physical activity in the elderly may be explained by an overly focused approach on the health benefits of activity, when in fact, one should focus on the elderly population's life satisfaction, sense of purpose, and sense of accomplishment [41].

5. Conclusions

Three months of LD classes were effective in reducing the depression status of second- and third-age dancers. Specifically, the biggest changes concerned a greater satisfaction and improvement in their lives, a greater interest in activities, less boredom, a good mood most of the time, greater happiness throughout the day, and the perception of a wonderful life (Item 11). Both before and after the study, the dancers felt energetic and preferred to go out rather than stay home, which may have allowed them to take part in the dance classes independently. Another aspect that did not change was the perception of having memory problems, which could be influenced by the discipline practiced, as group dances require a lot of memory. However, more work needs to be conducted on the mental and physical aspects to observe the long-term effects of this discipline.

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