

THE IMPACT OF BALLROOM DANCING ON THE LEVEL OF PHYSICAL HEALTH OF THE INDIVIDUAL

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Summary

The article is devoted to examining the impact of ballroom dancing on the level of physical health of the individual. As health-promoting activities increasingly gain attention in contemporary society, this study aims to provide empirical data on the benefits of dance as an alternative to traditional forms of exercise. Specifically, the primary objective of the research is to measure and analyze key morpho-functional indicators of health, such as cardiovascular fitness, muscular strength, and general vitality, to assess whether ballroom dancing can offer a holistic approach to improving individual health. The methodology employed for this study was a longitudinal research design. The study was conducted among students aged 17–20 during the academic years 2021–2022 in an educational institution in Lviv. Fourteen students participated, consisting of an even gender distribution – 7 females and 7 males. Various health indicators were measured at the beginning of the study and after an 8-month period of regular ballroom choreography training. Quantitative methods were used to collect data, including standard tests like the *Ruffier index* and the Robinson index, which were then statistically analyzed to ascertain any significant changes. The findings indicate a significant improvement in several health metrics. For instance, there was a notable increase in cardiovascular health as indicated by the *Ruffier index*. Though there were no significant changes in the Robinson index, there was a tendency towards positive dynamics, suggesting that the impact of ballroom dancing may require more nuanced investigation under different states of physical stress. Overall, the results demonstrate that ballroom dancing contributes positively to several aspects of physical health. The practical implications of this research are far-reaching. Given the generally negative attitudes towards traditional physical education classes, ballroom dancing could serve as an effective and more engaging alternative. As novice dancers can achieve a decent level of preparation without much difficulty and as the dance movements involve multiple muscle groups and cognitive functions, this form of exercise is both enjoyable and beneficial.

Key words: ballroom dancing, physical health, morpho-functional indicators, cardiovascular fitness, muscular strength.

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1. Introduction

In an era where technological advancements have made life easier yet paradoxically more complicated, the general state of public health has seen a concerning decline. Whether it's due to poor nutritional choices, increased stress levels, or sedentary work environments, people across different age groups are grappling with a range of health issues. It is now more critical than ever to find ways to maintain one's health, and that too in a manner that can be sustained over a lifetime. As we navigate this complex landscape, the importance of engaging in regular, moderate physical exercise cannot be overstated. While there are numerous avenues

for achieving this, from conventional gym workouts to outdoor sports, one often overlooked but highly effective and accessible option is ballroom dancing.

The subject of ballroom dancing and its potential health benefits has been rigorously explored in scientific research. Various studies have conclusively indicated that this form of social, physical activity offers a plethora of health advantages, both physiological and psychological. As an exercise, ballroom dancing is not merely about the movements of the feet and the rhythm of the music; it's a comprehensive physical and emotional experience. When you engage in ballroom dancing, you're not only burning calories and enhancing muscle tone but also improving your balance, coordination, and flexibility.

Furthermore, unlike other physical activities that focus only on certain muscle groups, ballroom dancing engages the whole body. The arms set the frame, the legs execute the steps, and the core muscles help in maintaining posture and balance. The combination of quick and slow movements is also effective in improving the cardiovascular system, thereby ensuring better heart health.

In addition to the physical attributes, the social aspects of ballroom dancing shouldn't be overlooked. It allows people to interact in a joyous and stress-free environment. The value of human connection, of looking into someone's eyes while dancing, contributes to mental well-being, reducing feelings of loneliness or depression.

The interest in the relationship between ballroom dancing and health is not just theoretical; it has been put to the test in real-world settings. A recent social experiment conducted among young beginners in ballroom dancing demonstrated encouraging results. The participants not only showed significant improvements in physical fitness but also experienced elevated mood levels and reduced stress.

Literature review. The existing literature on the influence of dance on physical health and well-being is rich but primarily focused on specialized populations. For example, Rehfeld et al. (2018) presented a seminal work on how dance training can be more effective than repetitive physical exercise in inducing brain plasticity among the elderly. This was supported by other studies emphasizing the cognitive benefits and balance abilities acquired through dance (Rehfeld et al., 2017; Sohn, Park, & Kim, 2018). Koutedakis and Jamurtas (2004) analyzed dancers as performing athletes, drawing parallels between the physical demands of both activities. Moreover, Vaccaro et al. (2019) explored how a six-month dance regimen could contribute to successful aging, indicating the long-term benefits of dance on health.

Schroeder et al. (2017) took a unique angle by investigating the potential of dance as an intergenerational program to increase access to physical activity. While these studies provide valuable insights, they are often focused on the elderly or specialized groups, leaving a gap in the literature concerning the younger demographic. Specifically, research on the morpho-functional impact of dance on somatic health indicators among adolescents or young adults is scant. This paucity makes our study unique and aims to fill this research gap by assessing the influence of ballroom choreography on physical (somatic) health markers. Therefore, this study contributes a much-needed perspective to the broader understanding of the benefits of dance on health across different age groups.

The aim of this research is to assess the impact of ballroom dancing on the level of physical health of the individual.

Methods and Methodology. In the 2021–2022 academic year, a comprehensive study was conducted at an educational institution in Lviv involving 14 students, equally split between males and females, aged 17–20. The research aimed to assess the impact of a complex ballroom choreography routine on the students' physical (somatic) health. We adopted a mixed-methods

approach that combined quantitative and qualitative data collection. Morpho-functional indicators such as heart rate, strength metrics, and Rufie and Robinson indices were measured before and after an 8-month ballroom dance training program. The data were collected using standardized medical and sports equipment to ensure reliability and accuracy.

To supplement the quantitative data, qualitative observations were made about the participants' level of engagement, motivation, and any noticeable changes in posture or physical well-being. These were based on self-reports, instructor feedback, and video analysis. This multi-pronged methodology allowed us not only to capture statistical changes in somatic health markers but also to consider subtler aspects such as emotional well-being and attitude toward physical education, providing a more holistic view of the effects of ballroom choreography on student health.

2. Results

In modern times, "ballroom dancing," "competitive ballroom dancing," and "dance sport" are terms that are frequently used interchangeably. Dance sport is a unique amalgamation of two diverse styles: International Standard and International Latin. These styles are performed in competitive settings that categorize dancers based on their skill levels and age groups (*Rehfeld et al., 2018*).

In the world of dance sport, a selection process is in place to choose the most emotionally and rhythmically intriguing dances for competitions. These dances form the core of various programs, such as the European and Latin American categories, as well as the all-encompassing "Ten Dance" program. Championships for amateurs typically fall under the purview of the International DanceSport Federation (IDSF), while professional events are often managed by English dance organizations (*Schroeder et al., 2017*).

One of the most compelling aspects of dance sport, particularly for young adults, is its ability to offer both mental and physical exercise. For those who engage seriously in this form of art, it provides a level of physical exertion that can be custom-tailored to individual needs. More seasoned dancers can achieve effective workouts without the risk of excessive fatigue. Additionally, the mental relaxation it offers is invaluable, especially in a world where overall well-being is under constant threat due to various life pressures (*Vaccaro et al., 2019*).

Choreography in the context of sports has also gained attention, with methodologies often rooted in classical and folk dance. Experts suggest that choreography not only serves as a tool for aesthetic education but also has a multifaceted impact on an individual. Physical development is an often-underemphasized benefit, which is especially crucial given the deteriorating state of health among young populations (*Koutedakis et al., 2004*).

Training in dance sport entails refining fine motor skills, which in turn activates a range of physiological functions. These include improved blood circulation, enhanced respiratory activity, and optimized neuromuscular functions. This understanding of one's own body contributes to boosted self-confidence, and helps in warding off psychological complexities. While numerous experts have acknowledged these advantages, there remains a gap in quantitative research focusing on the specific health impacts of dance sport (*Rehfeld et al., 2017*).

In order to conduct an empirical study, we set up an experiment to investigate the impact of dancing over time on the physical health of people, particularly young people. For assessing the level of physical (somatic) health, the G. L. Apanasenko methodology was applied. It quantitatively evaluated participants based on their morpho-functional indicators. According to this method, various indices were calculated: Vitality Index (considering lung capacity and

body mass), Strength Index (considering heart rate and systolic blood pressure), *Ruffier Index* (considering pulse rate increase and recovery after 30 squats in 45 seconds), and a Body Mass to Height ratio.

Statistical evaluation was performed using non-parametric criteria (sign tests and Wilcoxon for related populations). A difference was considered statistically significant at $p < 0.05$.

The training regimen employed the developed ballroom choreography routine. The sessions comprised of a warm-up, individual element practices, and pair composition elements. The weekly schedule was as follows: Monday – classical choreography for 1 hour, ballroom dances for 2 hours; Tuesday – individual dance lessons for 1–2 hours; Wednesday – general physical preparation for 1.5 hours; Thursday – stretching for 1 hour; Friday – ballroom dances for 2 hours.

An essential part of this research was to understand that optimal well-being doesn't necessarily come from having peak values in individual physical and functional parameters. Instead, it's about a balanced combination of these indicators. This balance is crucial for students, who are constantly under the strain of academic responsibilities, ensuring that their bodies can effectively manage energy reserves and maintain resilience.

In the initial stage before starting the ballroom dancing regimen, several health indicators were measured. The Vitality Index was found to range between 52 and 78 ml/kg, averaging around 63.3 ml/kg across all participants. Similarly, the Power Index demonstrated values between 31 and 45%, with an average of 45%. The Robinson Index had a range of 66 to 85 arbitrary units, and the average came to 73.7. The Ruffier Index varied between 6 and 14 arbitrary units, averaging at about 7.9.

When these morpho-functional indicators were summed up, the level of physical health was often found to be below average, rarely exceeding 10 points. This is noteworthy because the 'safe' limit, as per existing research, is set at 14 points. The data shows a concerning trend, suggesting the potential for somatic illnesses or at least the risk of such conditions developing down the line.

This finding was significant as it justified our choice of using ballroom dancing as a form of preventative physical rehabilitation. The activity involved complex choreographic exercises, which were executed both individually and in pairs. This approach was aimed at harnessing multiple facets of human motor skills to increase the body's adaptive energy reserves.

In essence, the study serves as a critical reminder that even among the young population, there is a considerable need for attention to physical health. It also suggests that incorporating activities like ballroom dancing could be an effective way to tackle this issue. The discipline not only promotes physical well-being but also offers a creative outlet, which could be especially beneficial for students who face constant academic and social pressures.

After 8 months of ballroom choreography lessons, a follow-up examination yielded the results outlined in Table 1.

As evident from the table, a significant positive dynamic was observed in the total scores of 12 subjects. Only one pair showed no substantial changes, which could be attributed to their lack of full effort in training and frequent illnesses.

Analyzing the results of the individual morpho-functional indicators, we found a significant increase in the functional reserve of the heart according to the Ruffier index, which is one of the most valuable criteria for energy potential along with the "double product" (Robinson index). The latter characterizes the systolic work of the heart. For this particular index, we didn't observe a statistically significant difference, although there was a trend towards positive dynamics. We believe that this may be due to the fact that the examination was carried out at

rest, rather than at the peak of physical exertion. Conversely, during the Ruffier test, where such exertion is anticipated, the difference was statistically significant. This can be attributed to the fact that the surveyed adolescents had been exposed to substantial training loads over an 8-month period, which was reflected in the test results.

Table 1

**Dynamics of morpho-functional indicators of physical (somatic) health
influenced by ballroom choreography**

Indicators	Positive Changes	Negative Changes	No Changes	Significance (p)
Vitality Index	9	0	5	< 0.01
Power Index	11	0	3	< 0.01
Robinson Index	10	2	2	> 0.05
Ruffier Index	10	1	3	< 0.01
Body Length Ratio	9	4	1	> 0.05
Total Score	12	0	2	< 0.01

Delving deeper into the above observation, it's worth mentioning that the Ruffier test involves a rigorous and challenging set of physical exercises that allows a comprehensive assessment of the heart's functional reserve. This indicates that regular involvement in ballroom dancing has a tangible impact on improving the cardiovascular system, a finding consistent with previous literature on exercise physiology.

Discussing the results, it is also essential to highlight that students often have a negative attitude towards physical education classes nowadays. In this context, ballroom dancing could serve as an appealing alternative for leisure time. In ballroom dance, newcomers attain an acceptable level of preparation without much difficulty. Moreover, the cultivated ability to execute simple steps proficiently, maintain proper posture, and a sense of balance fully compensates for the time spent on learning ballroom dancing (*Sohn et al., 2018*).

The aforementioned points reiterate the dual benefit of ballroom dancing. Not only does it offer a means for enhancing physical fitness metrics, but it also provides an outlet for adolescents who may not be drawn to conventional physical education. It enables them to explore a more artistic form of movement, which is crucial given the alarming rates of physical inactivity and the consequent health implications among adolescents aged 17–20. Therefore, the data from our study reinforces the idea that ballroom dancing could be a valuable addition to physical education programs, offering a multifaceted approach to health and well-being.

Discussion. The current discussion on the impact of ballroom dancing on physical and cognitive functions is both nuanced and dynamic. Lakes et al. (2016) posited that both novice and experienced dancers showed improvements in perceived physical fitness (PF) and cognitive functioning, although their assessment was primarily based on surveys (*Lakes et al., 2016*). On the other hand, Kattenstroth et al. (2011) demonstrated that expert dancers outperformed sedentary subjects in expertise-related domains such as balance, sensorimotor performance, and reaction times (*Kattenstroth et al., 2011*). However, in a subsequent study, the same authors argued that six months of dancing improved postural, sensorimotor, and cognitive performances in elderly individuals who had not danced regularly for five years—yet, they found no changes in cardio-respiratory functions (*Kattenstroth et al., 2013*).

Further extending this discussion, other studies have emphasized the neurological benefits of dance. Teixeira-Machado, Arida, and Mari (2019) and Müller et al. (2017) both found

that dancing could induce brain plasticity at both structural and functional levels, particularly in inexperienced dancers (Teixeira-Machado et al., 2019; Müller et al., 2017). However, the volume of dance practice over the years might differentially affect PF and cognitive functions, potentially leading subjects to reach a performance plateau at different times (Koutedakis & Jamurtas, 2004). Thus, the present study aims to fill this gap by investigating the effects of six months of ballroom dance on PF and reaction time in experienced middle-aged dancers, thereby contributing to this complex and evolving conversation.

3. Conclusions

The study's findings underscore the positive impact of ballroom dancing on various physical health indicators, particularly the cardiovascular system. A significant improvement was observed in the functional reserve of the heart according to the Ruffier index, providing strong evidence of the cardiovascular benefits. Although some measures like the Robinson index did not show statistically significant changes, the trend was generally positive, suggesting the potential benefits of ballroom dancing on heart function.

Additionally, the study also brings to light the cultural and social aspects of introducing ballroom dancing as a form of physical activity. Given the general disinterest in traditional physical education among adolescents, ballroom dancing serves as an appealing alternative. Not only does it offer an easier learning curve for beginners but it also provides an artistic and enjoyable way to engage in physical activity.

In conclusion, ballroom dancing emerges as a viable and effective means to improve cardiovascular health while also offering a socially engaging and culturally enriching alternative to traditional physical education. Given the positive outcomes observed, it would be beneficial to consider incorporating ballroom dancing into educational or fitness programs as a multifaceted approach to improve health and well-being.

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