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The impact of dance on fitness: Physical and educational benefits for high school students

Tekla Fruzsina TÓTH 

University of Debrecen, Institute of Sport Sciences, Dóczy József Street, H-4032 Debrecen, Hungary, e-mail:
fruzsinatoth05@gmail.com

Puskás Andrea LENTÉNÉ 

University of Debrecen, Institute of Sport Sciences, Dóczy József Street, H-4032 Debrecen, Hungary, e-mail:
lpandrea@sport.unideb.hu

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Abstract: Dancing, similarly to all sports, requires excellent stamina and mobility. It improves physical performance, sense of rhythm, mental and psychological development, and shapes personality. Our research examined dance's effect on high school students' fitness status. Our goal was to explore the role of dance education within school frameworks in developing individual abilities and skills. Therefore, we examined the effect of school dance programs on fitness and compared the outcome with the results of students who only participated in daily physical education classes. Furthermore, we studied the effect of folk dance on the performance of students who have dance and physical education classes at school. During our research, we carried out the NETFIT (National Uniform Student Fitness Test) test, as well as an online survey at three schools: Ferenc Medgyessy Grammar School and Vocational Technical School in Debrecen, at Nyíregyháza Art Vocational High School and Esze Tamás Grammar School in Mátészalka. The students of these schools participated in three different exercise programs. The members of the first group had dance classes only, the students of the second group took part in physical education classes besides dancing, and those in the third group did not participate in any form of dance movement at school. The research results show that dance, besides its influence on personality development, has a beneficial effect on fitness and is essential in creating a healthy lifestyle. The outcome of the tests proves that students who, in addition to physical education, participate in a dance exercise program reach significantly higher performance and fitness levels. The results also highlight that many students participating in the dance program choose some kind of sports activity outside school as a hobby.

Keywords: folk dance, dance and fitness, folk dance benefits, aerobic endurance, NETFIT assessment

Introduction

Education for a healthy lifestyle aims to maintain a balanced and positive mental state. A healthy lifestyle has many components, such as correct and adequate food intake, regular exercise, stress management, the ratio of rest and working time, spiritual and mental development, establishing realistic life goals together with a health-conscious lifestyle and social relationships (Barabás, 2006; Gyömbér et al., 2012; Müller, 2017; Müller & Bácsné, 2018; Kinczel & Müller, 2023). To establish a healthy lifestyle, it is essential to highlight the importance of health awareness. Therefore, it is strongly advised to start regular exercise and lifestyle education at a young age (Király & Szakály, 2011; Ferenczi & Lenténé, 2021; Židek & Müller, 2024). This is what the 2011 CXC. Act on National Public Education aims to foster the introduction of daily physical education in public education institutions from the 2012/13 academic year. The measure has proven effective and constructive over the last decade (Nagy et al., 2018; Borbély, 2019; Müller et al., 2022).

In Physical Education and Health Development, Physical Education and folk games appear as new subjects in the framework curricula. For 32 sessions, divided into two grades, folk dance is optional for students (Reiner et al., 2022). The framework curriculum focuses on teaching folk dance to strengthen the national heritage and develop social relations.

Dance is a form of movement focusing on aesthetic aspects, has sovereign expressive power, embodies the diversity of rhythmicity, and adapts to the accompanying music, thus establishing a uniquely wonderful new world. (Antal, 2010; Ónodi, 2017). Due to the connection between dance and music, students also get a musical experience while exercising (Molnár, 1983). Dance develops spatial perception, improves posture, movement coordination, the sense of rhythm, and other essential skills, so it fosters learning processes in general and affects everyday life (Antal, 2002; Jakabné & Fügedi, 2004; Antal, 2008). The movement material of dance improves all the central organ systems and other physical and mental abilities. (Nemessuri, 1976; Harsányi, 2000 and 2001; Makszin, 2007). In dance, physical performance is an artistic expression (Lezó, 2022). Due to their multifaceted developmental and motivational effects, dance forms dominate our leisure and fitness trends (Müller et al., 2013, 2017 and 2019; Boda et al., 2019).

The question often arises as to whether dance is to be considered a sport or a form of art, as there are areas, such as competitive dance or folk dance, which involve competition and require severe preparation and training (Pesovár, 1984; Prókai & Schulteisz, 2015). An appropriate level of physical fitness is essential for performance and successful participation in competitions of various levels. Moreover, much practice is necessary for the movements to be perfect and clean (Bányai & Sólymos, 2001; Chuprun, 2018). Dance also has a personality-forming effect, as positive experiences can shape behavioral patterns. In addition, dance plays a role in developing moral attitudes, such as discipline, assertiveness, social behavior, activity, cooperation, empathy, and self-awareness (Timár, 1999; Láng, 2020).

Recently, to improve performance, great emphasis has been placed on introducing new types of additional training to dance education, as the continuous

expansion of the body's physical limits is becoming increasingly critical in dance (Lezó, 2022).

Materials and methods

Our study aimed to explore the role, level, and effect of music-dance movement education in secondary schools. Our research examined whether the fitness indicators of the three groups we chose differ regarding their strength and endurance indicators. We also explored whether the students attending the dance program pursue any sport outside the school framework.

To answer our questions, we measured the fitness status of 67 young people participating in three different programs at three high schools. The students in the first group learn folk dance only in grammar school and have an average of twenty dance lessons per week. Three students also go to dance classes outside of school and have been dancing since they were six.

In the second group, students learn to dance at school and attend three physical education classes a week. These participants have been dancing since childhood, on average, for ten years. In addition to physical education classes, the students participate in an average of twenty folk dance lessons per week, significantly increasing their overall exercise. Three students in this group also attend folk dance classes outside of school. Most students in both groups pursue sports as a hobby besides dancing.

The students in the third group do not participate in any dance exercise program; they attend five physical education classes a week at school. However, several of these students do some other physical exercise regularly.

For the research aim, we used the mandatory, uniform method of measuring fitness in the Hungarian public education system, which was developed by the Hungarian Student Sports Association (MDSZ) in collaboration with the Cooper Institute (Kaj et al., 2014). This unified test system serves as an evaluation and reporting tool for physical education teachers and provides up-to-date information on students' fitness status (Szakály, 2019). The fitness measurement system distinguishes between four fitness profiles, including different fitness tests.

During our research, we assessed three profiles: Body composition and nutrition profile, which consists of measuring body weight and body height and determining the body mass index; the Aerobic fitness (endurance) profile, which was based on a 20-meter endurance shuttle run test, and the Skeletal fitness profile, which included a scheduled abdominal and push-up test, and a test providing information on the strength and extensibility of the core extensor muscles. The test system compared the state of fitness to criteria adapted to gender and age. Based on this, students were divided into three categories: "Healthy," "Needs Improvement," or "Needs Significant Improvement." A student who falls into the "Healthy Category" is likely to be less prone to diseases associated with physical inactivity in the long term. Those who perform less well were placed in the other two categories, where attention was drawn to the fact that more exercise and sports activities are needed to achieve a healthy state of physical fitness (Kaj et al., 2014). In each institution, a tool package,

a manual, and an instructional film containing the assessment protocol were available. The results were processed using the Microsoft Excel program.

Results and discussions

Aerobic fitness index

Based on the results measured in the 20 m endurance shuttle run test, it can be concluded that the aerobic performance of each group is different. The best-performing student (1520 m) belonged to the group of students who had dance classes only. The student who does not participate in any form of dance movement at school performed similarly well (1300 m). At the same time, this group also included the students whose endurance proved to be the weakest. He was able to run only 280 meters.

The students with the best performance on average (831 m) were members of the group participating in the dance program at school, while those participating in five physical education classes a week reached the lowest aerobic fitness level; they were able to complete an average of 655 m on the running test.

The results showed a considerable difference in the performance of the students participating in the five physical education classes per week. Examining the other two groups, we found that the results of the students participating only in the dance program were similarly heterogeneous in terms of performance. The most homogeneous group was the group that had physical education classes in addition to dance classes (Figure 1).

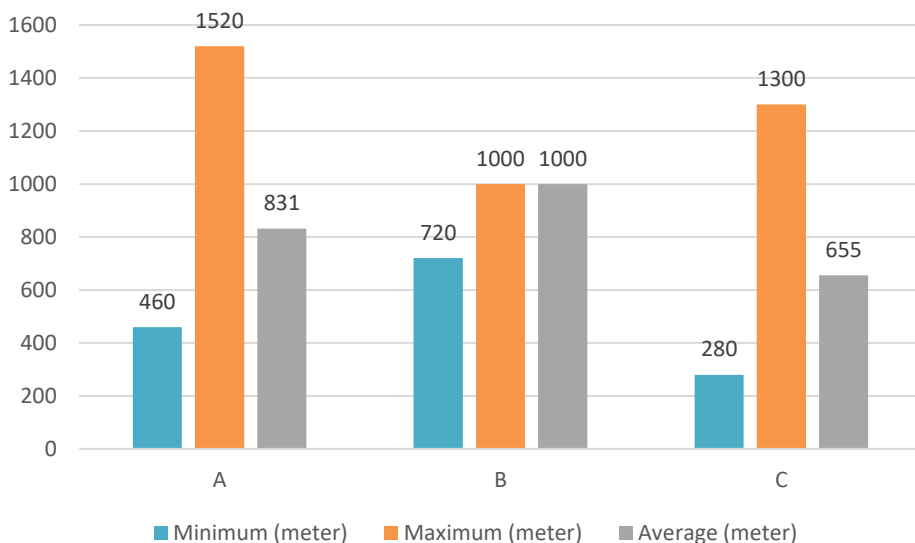


Figure 1. Evaluation of aerobic fitness profile results (*A - dance lessons exclusively; B - dance classes, plus three physical education lessons a week; C - five physical education classes a week*)

Being aware of the results, we examined which NETFIT category each student falls into. We found that 52% of the students who learn dance exclusively were in the Healthy Category, 47% in the Needs Improvement Category, and 7% in the Needs

Improvement Category. On the other hand, those who attended physical education and dance were all placed in the Healthy Category. The study showed that more than a third (39%) of the students who do not attend dance classes were in the Needs Improvement Category, while almost half (47%) could be classified in the Healthy Category. These results prove that the dance program positively influences aerobic endurance.

The abdominal muscle test results

The results of the scheduled abdominal muscle test showed a difference in the performances of each group. In the group attending dance classes only, the maximum number of repetitions was the same as those participating in physical education besides dance (80). However, the maximum performance measured in the third group was only 48 sit-ups, significantly weaker than the other two groups.

We also experienced a difference in the minimum results. The student who performed the weakest (15 repetitions) is a member of the group that attends five physical education classes a week and participates in a dance exercise program. In the dance group, the student who did the fewest sit-ups could do slightly less than half the same number of exercises as the student who did the most. Comparing the performances of the three groups, the results showed a significant difference between the average number of sit-ups performed. There were groups where the students did an average of 66 sit-ups, and there were groups where they did only 35 sit-ups. Examining the average performance, the best performing groups were those who have dance classes at school, the weakest result on the scheduled abdominal muscle test (35 pcs) was the group who do not participate in any form of dance movement at school apart from the five weekly physical education classes (Figure 2).

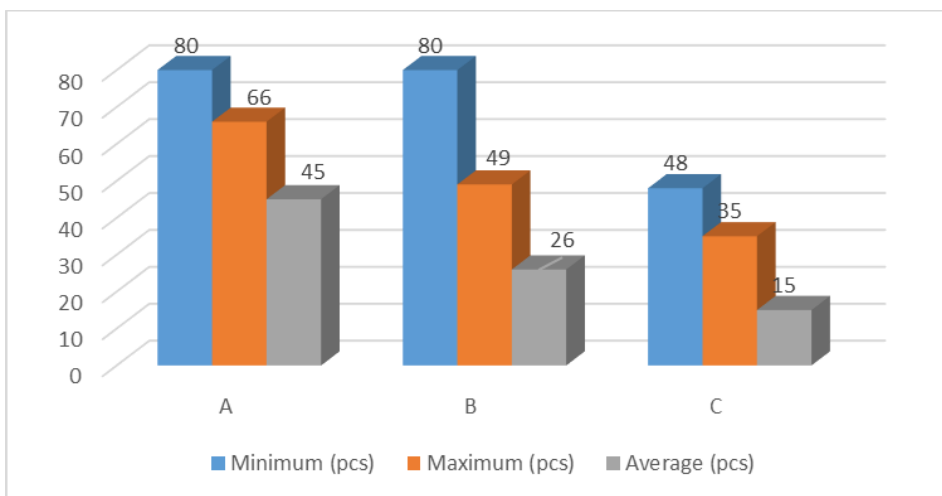


Figure 2. Evaluation of scheduled abdominal muscle test results (A - dance lessons exclusively; B - dance classes plus three physical education classes a week; C - five physical education classes a week)

Based on the classification in the NETFIT zone, it can be concluded that the dance program participants and those who attend physical education and dance are all placed in the Healthy Category. On the other hand, the study showed that 7% of the students who attended only five physical education lessons per week fall into the Needs Improvement Category. Most of these students (93%) were placed in the Healthy Category. Based on the results, we determined that the dance program positively influences the strength and endurance of the abdominal muscles.

The strength of the extensor muscles

The test results showed that the maximum number of torso lifts was the same for all groups (30), but the minimum results marked a difference. The student with the lowest score (14) is a group member who participates in only five physical education lessons per week. The group averages showed that the students in the first two groups, which also focus on dance, could perform 26-27 torso lifts. In contrast, the average for the students attending only physical education classes was slightly less, 22. The diagram clearly shows that students' performance within each group is different. We measured the most significant difference within the group among students who attended only physical education classes (Figure 3).

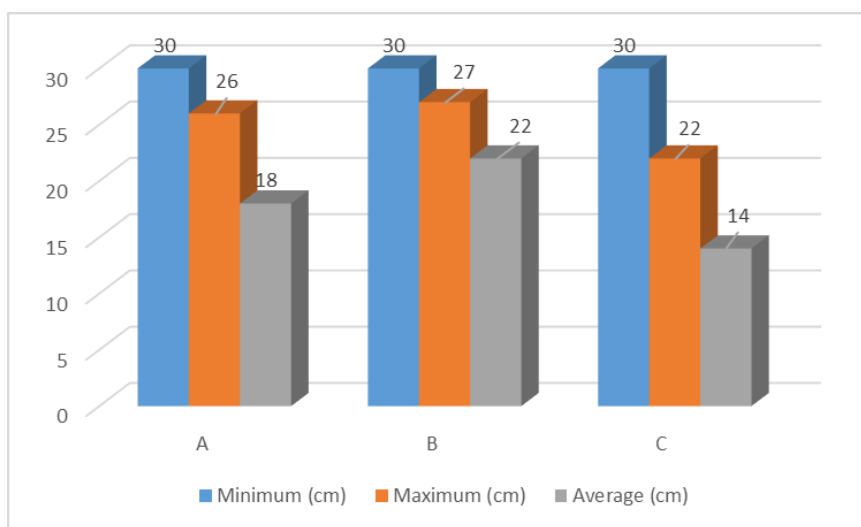


Figure 3. Evaluation of the results of core extensor muscle strength test (*A - dance lessons exclusively; B - dance classes plus three physical education classes a week; C - five physical education classes a week*)

The classification in the NETFIT health zone, based on the test results measuring the strength of the core extensor muscles, showed that 78% of the students attending the dance program were classified in the Healthy Category, and 22% were placed in the Needs Improvement Category. From the group where there are three physical education classes in addition to dance, a significant majority of students (91%) were in the Healthy Category, while the performance of 9% requires improvement. Half the students attending five physical education lessons per week (50%-50%) were placed in the Healthy and Needs Improvement categories.

The results of the upper body muscle strength test

Finally, differences can be found between the studied groups when comparing the results of the scheduled push-up test. The best-performing student was in the group participating only in the dance exercise program; he could perform 48 arm flexions and extensions. All three groups had students who performed poorly on the push-up test. Among the students who attended five physical education classes a week and those who attended physical education classes in addition to dance, there was one who could perform only one push-up. The diagram clearly shows that the results of the scheduled push-up test of all three groups also show differences within the group. The most significant difference between the students' results was in the group of students who had dance classes only since the difference between the best and the weakest performance was 45 arm flexions and extensions. Among the students of the three groups, the performance of the students who attended physical education five times a week was the closest to each other. The students participating in the dance program were able to perform more push-ups on average (18 pcs) than the members of the other two groups (Figure 4).

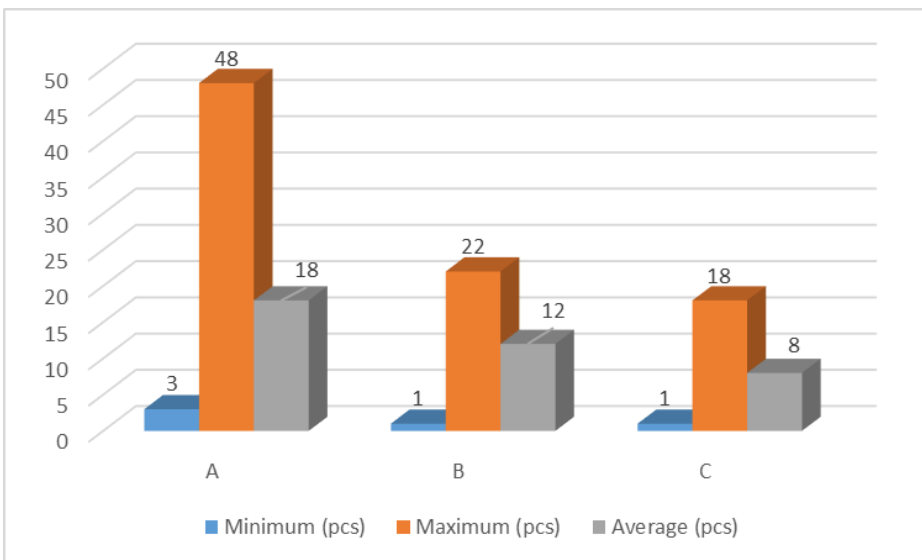


Figure 4. Evaluation of the results of the scheduled push-up test (A - dance classes exclusively; B - dance classes plus three physical education classes a week; C - five physical education classes a week)

According to the results of the push-up test, 93% of the students attending dance classes are classified to the Healthy Category and 7% to the Needs Improvement Category. In addition to dance, the students attending the physical education class performed similarly; 91% fell into the Healthy Category and 9% into the Needs Improvement Category. Of the students attending physical education classes, 64% are categorized as healthy, and 36% need improvement. Based on the results of this test, the dance program positively influences the level of strength and endurance of the upper body

Conclusions

In our research, we aimed to find out whether the aerobic fitness index is better for students who attend dance classes in addition to physical education. Based on the results obtained during the survey, we found that dancing significantly increases aerobic fitness, and students who dance in addition to physical education perform better on the aerobic endurance test.

In the strength-endurance tests, the best results were obtained by students majoring in dance. The results showed that the students who participated in the dance program performed more abdominal exercises on average than those who did not take up dance. The group with only a dance program at the school performed 6% better than the group with dance and physical education and 28% better than the students attending physical education.

Based on the results of the push-up test, it can be concluded that the students studying dance performed 56% better. In comparison, the students attending dance and physical education classes performed 32% better than those attending only physical education classes. The test measuring the strength of the core extensor muscles showed a similar result, as the students who regularly participate in the dance program have significantly higher endurance levels.

We found that many dance program students also do regular sports outside of school. The research results showed that, on average, more than half (56%) of the students participating in the dance program are active in sports outside of school for 6 hours a week. Those who dance choose other sports as a hobby besides folk dancing, which enables them to improve their strength and fitness.

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