



EFFECT OF VOLLEYBALL TRAINING ON THE COORDINATION ABILITIES AND FUNCTIONAL FITNESS OF UNIVERSITY STUDENTS

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Abstract. *The study examined the influence of volleyball training on the development of coordination abilities and functional fitness among university students. The growing prevalence of sedentary lifestyles, reduced motor activity, and declining physical preparedness among students necessitates the search for effective forms of physical education. Volleyball, characterized by dynamic movements, rapid motor responses, spatial orientation, and collective interaction, possesses significant potential for improving students' physical condition.*

The research involved 64 university students aged 18-20 years who were randomly assigned to a control group (n=32) and an experimental group (n=32). The control group participated in traditional physical education classes, while the experimental group completed a volleyball-oriented training program for 16 weeks. Assessment procedures included tests of coordination abilities (shuttle run, balance test, reaction speed, movement accuracy) and indicators of functional fitness (heart rate recovery, Ruffier index, vital lung capacity).

The results demonstrated significantly greater improvements in the experimental group compared with the control group. Students participating in volleyball training showed enhanced coordination performance, improved balance stability, faster motor reactions, and more

favorable functional indicators of the cardiovascular and respiratory systems.

The findings confirm that systematic volleyball training represents an effective pedagogical tool for improving coordination abilities and functional fitness in university students. The incorporation of volleyball elements into university physical education programs may contribute to increasing the effectiveness of health promotion and motor development among young adults.

Keywords: *volleyball, university students, coordination abilities, functional fitness, physical education, motor activity, balance, reaction speed.*

Introduction. Modern higher education is characterized by increasing academic workloads, widespread digitalization, and reduced levels of motor activity among students. These factors negatively affect physical preparedness, functional health indicators, and the overall adaptive capacity of young people. Insufficient physical activity is associated with decreased coordination abilities, deterioration of cardiovascular function, reduced muscular efficiency, and lower resistance to physical and psychological stress [2].

University physical education plays a crucial role in maintaining students' health and promoting comprehensive physical development. However, traditional physical education programs do not always provide sufficient opportunities for improving complex motor abilities and sustaining students' motivation toward regular physical exercise. Consequently, there is a growing need for effective pedagogical

approaches capable of enhancing both physical and functional preparedness [1, 4].

Sports games occupy a special place within university physical education due to their accessibility, emotional engagement, and multifaceted impact on the organism. Among them, volleyball is considered one of the most effective means of developing motor skills, coordination, reaction speed, agility, and functional endurance. Volleyball activities involve rapid changes of movement direction, jumping actions, spatial orientation, visual-motor coordination, and collective interaction, which stimulate multiple physiological and neuromuscular systems simultaneously [3,6].

Coordination abilities constitute an essential component of physical preparedness and significantly influence movement efficiency, technical skill acquisition, and successful adaptation to dynamic environments. According to contemporary sports pedagogy, coordination development includes balance control, spatial orientation, motor differentiation, movement accuracy, and rapid sensorimotor responses. Functional fitness, in turn, reflects the adaptive state of the cardiovascular and respiratory systems and serves as an important indicator of physical health and exercise tolerance [8].

Previous studies have demonstrated the positive effects of sports games on students' physical development, motor activity, and motivation toward exercise participation. Researchers report that volleyball training contributes to improvements in agility, speed-strength qualities, reaction capacity, and teamwork skills. Nevertheless, the influence of volleyball training specifically on coordination abilities and functional fitness among university students remains insufficiently investigated,

particularly within the context of higher education physical education programs [5, 7].

Therefore, the purpose of this study was to determine the effectiveness of volleyball training in improving coordination abilities and functional fitness of university students.

Research objectives:

- To assess the initial level of coordination abilities and functional fitness among university students.
- To develop and implement a volleyball-oriented physical education program.
- To evaluate changes in coordination and functional indicators after a 16-week training intervention.
- To compare the effectiveness of volleyball training with traditional university physical education classes.

Materials and Methods. The study involved 64 university students aged 18-20 years. The participants were divided into two groups:

Control group (CG, n=32)-students attending regular physical education classes;

Experimental group (EG, n=32)-students participating in volleyball-based training.

The experiment lasted 16 weeks.

Training Program. Students in the control group followed the standard university physical education program, including general physical exercises and fitness activities.

Students in the experimental group completed a volleyball-oriented training program integrated into physical education classes. The program included:

- volleyball technical exercises;
- passing and serving drills;
- jumping exercises;
- coordination and agility exercises;
- movement and reaction drills;
- game practice.

Assessment Methods:

- Testing was conducted before and after the experiment.
- Coordination Ability Tests

The following tests were used to evaluate coordination abilities:

- 4 × 9 m shuttle run-assessment of agility and movement coordination;

- Balance test-assessment of body stability and postural control;
- Reaction speed test-assessment of motor response speed.

Functional Fitness Tests. Functional fitness was evaluated using:

- Heart rate recovery test-assessment of cardiovascular recovery after exercise;

- Ruffier index-assessment of cardiovascular functional condition;
- Vital lung capacity-assessment of respiratory system function.

The obtained data were processed using basic statistical methods. Mean values and percentage changes were calculated. Differences between groups were considered statistically significant at $p < 0.05$.

Results. After the 16-week experiment, positive changes were observed in both groups. However, the improvements were greater in the experimental group that participated in volleyball training.

In the assessment of coordination abilities, students from the experimental group demonstrated better results in agility, balance, and reaction speed. Shuttle run performance improved more noticeably compared with the control group, indicating enhanced movement coordination and faster changes of direction. Balance ability also increased, showing better body control and postural stability. In addition, students involved in volleyball training showed faster motor reactions.

Functional fitness indicators improved in both groups, but the experimental group achieved more pronounced progress. Heart rate recovery after physical exercise became faster, suggesting improved cardiovascular adaptation to training loads. The Ruffier index results also reflected a better functional state of the cardiovascular system. Furthermore, students participating in volleyball exercises demonstrated an increase in vital lung capacity, indicating improved respiratory system function.

The obtained results confirm that regular volleyball training has a positive effect on the coordination abilities and functional fitness of university students. Compared with traditional physical education classes, volleyball-based training proved to be more effective in improving motor coordination, reaction abilities, and functional preparedness ($p < 0.05$).

Discussion. The findings of the present study demonstrate that volleyball training positively influences the coordination abilities and functional fitness of university students. The experimental group showed

greater improvements than the control group, which confirms the effectiveness of volleyball-based physical education.

The positive changes in coordination abilities can be explained by the specific characteristics of volleyball activity. Volleyball requires rapid movements, quick decision-making, accurate motor actions, balance control, and constant changes of body position. Regular performance of such movements contributes to the development of agility, reaction speed, and movement coordination.

The improvement in functional fitness indicators may be associated with the combined physical demands of volleyball training. Repeated jumping actions, movement intensity, and active game situations stimulate the cardiovascular and respiratory systems, leading to better adaptation to physical exercise.

The obtained results are consistent with previous studies reporting that sports games can improve students' physical preparedness, motor activity, and overall physical condition. Volleyball training creates an emotionally engaging learning environment that increases students' interest and participation in physical education classes.

Therefore, the inclusion of volleyball exercises in university physical education programs can be considered an effective pedagogical approach for improving coordination abilities and functional fitness among students.

Conclusion. The study showed that volleyball training is an effective means of improving coordination abilities and functional fitness among university students. After the 16-week intervention, students in the experimental group demonstrated better results in agility, balance,

reaction speed, and functional preparedness compared with the control group.

Regular volleyball training contributed to improvements in cardiovascular and respiratory function, as well as enhanced movement coordination and motor performance. The dynamic and game-based nature of volleyball increased the effectiveness of physical education activities.

The findings suggest that volleyball exercises can be successfully integrated into university physical education programs to promote students' physical development, coordination abilities, and functional health. Further studies may investigate the long-term effects of volleyball training on different aspects of students' physical preparedness.

References.

1. Shaymardanov, R. (2022). «Jismoniy tarbiya fani nazariyasi va rivojlanish bosqichlari». *Eurasian Journal of Social Sciences, Philosophy and Culture*, 2(12), 231-234. <https://doi.org/10.5281/zenodo.7349519>
2. Development of coordination abilities in student volleyball players. (2025). *International Journal of Artificial Intelligence*, 5(11), 2262-2265. <https://www.academicpublishers.org/journals/index.php/ijai/article/view/8247>
3. Kurbonovich, A. O., & Narzulloyevich, S. R. (2019). Methods of organizing and conducting athletic training. *European Journal of Research and Reflection in Educational Sciences Vol*, 7(12).

4. Umbarov, D. M., & Xaqnazarov, Q. Q. S. (2020). Theoretical foundations of the introduction of pedagogical technologies in physical education lessons. *Интернаука*, (8-2), 62-64.

5. Turdimuratov, D. (2025). Maktabgacha yoshdagi bolalarda irodaviy sifatlarni shakllantirishning pedagogik sharoitlari va qonuniyatlari. *Sport Ilm-Fanining Dolzarb Muammolari*, 3(3), 119-124.

Retrieved from <https://sport-science.uz/index.php/journal/article/view/275>

6. Qoshayevich, X. Q. (2023). National Action Games and Practical Significance of Their Development. *American Journal of Pedagogical and Educational Research*, 12, 129-133.

7. Uralovna, H. N. (2021). Attraction and attention of women's wrestling in Uzbekistan. *Galaxy International Interdisciplinary Research Journal*, 9(11), 703-704.

8. Uralovna, H. N., & Musaevich, U. D. (2019). The importance of rhythmic gymnastics in developing pupils' physical capabilities. *European Journal of Research and Reflection in Educational Sciences Vol*, 7(12).