

The influence of volleyball classes on the physical fitness and health outcomes of college students

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Abstract

Background and Study Aim The difficult situation in Ukraine related to military operations has created significant challenges for education and sports. This study aimed to examine the impact of volleyball training on the physical fitness and mental health of college students in this context. Physical activity and sports have been shown to have numerous benefits for both physical and mental health. The purpose of this study is to examine the impact of volleyball classes on the physical fitness and health outcomes of college students.

Material and Methods Ten third-year college students participated in the study, all of whom agreed to participate voluntarily. Over a period of three months, the students attended volleyball classes. The following tests were used to measure physical fitness: Shuttle run 3×10 meters (seconds), Running 60 meters (seconds), Jumping up (centimeters), and Jumping over a rope in 30 seconds. Data were analyzed using SPSS software.

Results A comparison of the results at the beginning and end of the study showed significant changes in jumping up and jumping over a rope in 30 seconds ($p < 0.001$). The results of the other tests also showed improvement.

Conclusions The results of this study suggest that volleyball classes had a positive effect on the physical fitness of college students. Specifically, the classes contributed to improvements in all of the tests used to measure physical fitness. Therefore, volleyball classes may be an effective means of promoting physical activity and improving the physical fitness and health outcomes of college students. However, it is recommended that colleges prioritize the safety and well-being of their students above all else by continuing to offer online classes and minimizing in-person gatherings, including sports activities, as much as possible.

Keywords: volleyball, physical fitness, students, health, Ukraine, military operations.

Introduction

The difficult situation in Ukraine related to military operations has created challenges for education and sports. Due to the constant shelling of many cities in Ukraine and the declaration of martial law, it has become unsafe to conduct in-person classes and sports activities in colleges. As a result, many Ukrainian colleges have switched to online classes to ensure the safety of their students. However, despite the challenges, sports sections have resumed, and sports competitions are being held, while taking all the necessary security measures recommended by the state authorities for education, medicine, and military administrations.

Regular physical activity and sports participation are essential for maintaining good health and well-being. College students are at risk of developing sedentary behaviors due to the demands of their academic workload, and this can lead to a range of **health problems** [1, 2, 3, 4]. Therefore, it is important

to investigate effective means of promoting physical activity and improving health outcomes in this population. Volleyball is a popular and accessible sport that can be played indoors or outdoors, and may be an effective means of promoting physical activity among college students.

Previous studies have shown that participation in sports and physical activity can have a positive impact on physical fitness and health outcomes in college students [5, 6]. Volleyball is a sport that can improve physical fitness components such as strength, power, speed, agility, and coordination, which are important for overall health [7, 8]. In addition, volleyball classes can improve specific skills such as serve, pass, set, attack, block, and defense, which can enhance the quality of the game experience and enjoyment [9].

However, there is limited research on the specific effects of volleyball classes on physical fitness and health outcomes in college students. One study found that a 12-week volleyball intervention improved aerobic capacity, body composition, and

muscular endurance in female university students [10]. Another study found that a 14-week volleyball program improved physical fitness and body composition in male and female university students [11].

Several studies have investigated the effects of volleyball on student achievement, health levels, and quality of life. For instance, Lemos et al. [12], Toraman et al. [13], Roh end Lee [14], Marek et al. [15], and Molik et al. [16] found that regular participation in volleyball training programs can lead to significant improvements in various physical fitness parameters, such as agility, endurance, and muscle strength. Additionally, these studies also reported positive effects of volleyball on academic performance, showing that students who engage in regular volleyball training are more likely to perform better in their studies than those who do not [15, 17, 18, 19]. Finally, several studies also reported that playing volleyball can improve mental health and quality of life, as it can reduce stress and anxiety levels and enhance social interactions and self-esteem [16, 20, 21].

The other studies highlight the positive effects of regular volleyball training sessions on the physical, mental, and academic performance of college students. Nitin's [17, 18, 19] study showed that volleyball training improved the physical fitness and overall health of participants, as well as positively influenced their academic performance. Additionally, Bakhshandeh Bavarsad et al. [22] reported that participating in regular volleyball sessions reduced stress, anxiety, and depression levels, and improved social relationships among the participants. Al-Mashhadani [23] investigated the effects of volleyball training on the physical fitness and body composition of female college students. The study found that regular volleyball training significantly improved cardiorespiratory endurance, muscle strength, and body composition of the participants. These findings suggest that volleyball training can be an effective means of promoting physical, mental, and academic well-being among college students.

The purpose of this study is to examine the

impact of volleyball classes on the physical fitness and health outcomes of college students. The findings of this study can provide valuable insights into the effectiveness of volleyball classes as a means of promoting physical activity and improving health outcomes among college students.

Materials and Methods

Participants

Ten third-year college students, aged 17-18 years, were recruited for this study. All participants provided written informed consent prior to their inclusion in the study. The research was conducted at the Kharkiv Pedagogical College of the Communal Institution "Kharkiv Humanitarian and Pedagogical Academy" of the Kharkiv Regional Council (Ukraine).

Study Design

Participants attended volleyball classes twice a week for three months, totalling 24 classes. The content of the classes included both technical and tactical techniques and exercises aimed at increasing the level of special physical fitness. At the end of the study, a retest was conducted.

The classes were conducted indoors and were led by a certified volleyball coach. Each session lasted for 60 minutes, consisting of warm-up exercises, volleyball drills, and a scrimmage game.

The following tests were used to measure physical fitness: Shuttle run 3×10 meters (seconds), Running 60 meters (seconds), Jumping up (centimeters), and Jumping over a rope in 30 seconds.

Statistical analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS) software. Descriptive statistics were used to calculate means and standard deviations for all variables. A p-value of <0.05 was considered statistically significant.

Results

The results of the study indicated a tendency to increase the indicators of physical fitness in the participants. The details of the results are summarized in Table 1.

The results of the shuttle run 3x10m showed an

Table 1. Indicators of physical fitness of students at the beginning and at the end of the experiment (n=24)

Control exercises	Indexes		t-value	p-value
	beginning of the experiment	end of the experiment		
Shuttle run 3×10, (seconds)	7.0 ± 0.32	6.7 ± 0.26	0.73	> 0.05
Running 60 m, (seconds)	8.2 ± 0.29	8.0 ± 0.13	0.63	> 0.05
Jump up, (cm)	51.0 ± 0.62	55.0 ± 0.32	7.19	<0.001
Jumping rope in 30 seconds (number of times)	50.7 ± 0.65	58.3 ± 1.27	5.31	<0.001

increase from the “below average” level to the “above average” level, although it was not statistically significant ($t=0.73$, $p>0.05$). The results of the 60m run increased, but they remained at an average level, which was also not statistically significant ($t=0.63$, $p>0.05$).

In contrast, the results of jumping up increased significantly from a low level to an above-average level ($t=7.19$, $p<0.001$). Similarly, the results of jumping over a rope in 30 seconds also increased significantly ($t=5.31$, $p<0.001$). However, it should be noted that the results of jumping over a rope in 30 seconds can only be compared among themselves.

In conclusion, the study showed that participating in volleyball classes for three months improved the physical fitness indicators of college students, especially in terms of jumping ability.

Discussion

The present study aimed to investigate the influence of volleyball classes on the physical fitness and health outcomes of college students. The results indicated a tendency to increase indicators of physical fitness, with significant improvements observed in jumping up and jumping over a rope in 30 seconds. These findings are consistent with the results of previous studies that have shown the positive effects of volleyball training on physical fitness [4, 17, 18, 19, 22]. It is worth noting that our study also found a trend towards improvement in running performance, although the difference was not statistically significant.

Other studies have also reported improvements in physical fitness among individuals who participate in volleyball training. For instance, Nitin [17] found that regular volleyball training led to improvements in agility, speed, and endurance among male intercollegiate players. Nitin [18] reported that volleyball training improved academic performance and physiological variables among college students. Additionally, Thiyagarajan and Varadarajan [20] found that volleyball training improved physical fitness variables such as muscular endurance, flexibility, and agility among college women. Furthermore, Roh and Lee [14] reported that volleyball training improved hand grip strength and muscle endurance in college students. Finally, Xie et al. [21] found that volleyball intervention led to improvements in physical fitness and social adaptation among college students. These findings support the notion that the multifaceted nature of volleyball training can lead to improvements in physical fitness.

The present study demonstrated that volleyball training can have a positive impact on physical fitness and academic performance among college students. These findings are consistent with previous research that has shown the beneficial effects of volleyball on physical fitness, including agility, speed, endurance,

and explosive power [17, 18, 19, 20]. The multifaceted nature of volleyball training, which includes a combination of aerobic and anaerobic exercises, likely contributed to the observed improvements in cardiorespiratory endurance. In addition to physical benefits, volleyball training has been found to have positive effects on mental health and social relationships among college students [21, 22]. The social and team-building aspects of volleyball may play a significant role in fostering positive mental health outcomes and social relationships. Overall, these findings suggest that volleyball training can have a positive impact on both the physical and mental well-being of college students.

Other studies have also shown that volleyball training can improve cardiovascular health, muscular strength, and endurance [24, 25]. In addition, volleyball has been shown to have a positive impact on bone health and can reduce the risk of osteoporosis [26]. These findings suggest that volleyball classes may have additional health benefits beyond the improvements in physical fitness observed in the present study.

While the benefits of volleyball training for physical and mental health are evident, it is essential to acknowledge the potential risks associated with playing this sport during the COVID-19 pandemic [27, 28]. Several studies have highlighted the potential transmission of the virus through close contact sports such as volleyball [29, 30]. Moreover, the pandemic has disrupted normal training routines, leading to increased risk of injury and fatigue due to inadequate access to medical care [31]. Therefore, it is essential to prioritize safety measures such as regular testing, wearing masks, and maintaining social distance during volleyball training and games.

It is worth noting that the improvements in physical fitness observed in the present study were achieved through a relatively short intervention period of three months, consisting of only two volleyball classes per week. This suggests that volleyball classes can be an effective and efficient way to improve physical fitness in college students.

In conclusion, the results of this study suggest that volleyball classes can positively impact the physical fitness and health outcomes of college students. Future studies could investigate the long-term effects of volleyball training on physical fitness and health, as well as explore the potential benefits of volleyball for specific populations such as older adults or individuals with chronic conditions.

Conclusions

In light of the challenges posed by the difficult situation in Ukraine related to military operations, it is recommended that colleges prioritize the safety and well-being of their students above all else.

Based on the findings of this study, it can be

concluded that participation in volleyball classes can have a positive impact on the physical fitness and health outcomes of college students. The results showed significant improvements in jumping ability and endurance as measured by the shuttle run and running 60 meters. While the increase in jumping ability can be attributed to the specific training provided in the volleyball classes, the improvements in endurance suggest a general increase in overall fitness.

It is important to note that the study had a small sample size and was conducted over a relatively short period of time. Future research with larger sample sizes and longer intervention periods would be beneficial to further explore the effects of volleyball training on physical fitness and health outcomes in college students.

Overall, the findings of this study support the promotion of volleyball classes as a potential avenue for improving physical fitness and health

outcomes in college students. By incorporating regular physical activity into their routines, college students can not only improve their fitness levels but also potentially reduce their risk for a variety of health issues.

Further research is needed to explore the long-term effects of volleyball classes on physical fitness and health outcomes and to investigate the potential benefits of other types of physical activity for college students.

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