



Effect of futsal student activity unit participation on physical fitness among university students

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Abstract: Physical fitness plays a significant role in promoting health, enhancing productivity, and enabling students to effectively engage in their daily academic responsibilities. Nevertheless, university students often experience a decline in physical activity due to their largely sedentary routines and the growing reliance on digital technology. To counter this trend, one viable approach is to encourage student involvement in sports activities organized by student organizations, such as the Futsal Student Activity Unit (UKM). The objective of this study was to evaluate the impact of participation in the Futsal Student Activity Unit on enhancing physical fitness among students at Universitas Subang. This research utilized a quantitative methodology with a pre-experimental framework, specifically a one group pretest-posttest design. The sample consisted of 15 students who engaged actively in the futsal UKM events. Data collection involved conducting physical fitness assessments both prior to and following the training program, which included evaluations of cardiorespiratory endurance along with other fitness components. The analysis of the data was conducted using descriptive statistics and a paired sample t-test to identify any differences between the pretest and posttest outcomes. The findings demonstrated that engaging in futsal activities positively influenced the physical fitness levels of the students. Those who participated consistently in futsal training exhibited improvements in their fitness after the intervention. In summary, participating in the Futsal Student Activity Unit can effectively enhance the physical fitness of university students and serves as a valuable strategy for fostering active lifestyles within higher education settings.

Keywords: physical fitness; futsal; student activity unit; university students; sports participation

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INTRODUCTION

Physical fitness is a crucial parameter that supports a person's health and ability to efficiently carry out daily activities. For students, physical fitness not only maintains physical health but also impacts focus, learning productivity, and endurance in various academic and non-academic activities (Koota et al., 2021). Students with good physical fitness tend to be able to carry out lectures more efficiently and experience less fatigue than those with low levels of physical fitness (Raden Dadan Pra Rudiana & Arif Fajar Prasetyo, 2024).

However, technological advances and changes in modern lifestyles have resulted in reduced levels of physical activity among college students. Busy academic schedules, high use of digital devices, and a tendency to spend time on sedentary activities such as playing with gadgets, watching TV, or sitting for long periods can reduce physical fitness levels (Mendes et al., 2022). If this situation persists over time, it can have negative health effects, such as an increased risk of obesity, decreased cardiovascular endurance, and lower overall physical fitness levels (Chaari et al., 2025).

In higher education, educational institutions play a crucial role in encouraging students to maintain physical activity through various sports programs and activities (Tertuliano et al., 2025). One way to help increase student physical activity is through Student Activity Units (UKM) in the sports field. UKM sports serve as a place to develop students' interests and abilities in sports, as well as a platform for fostering physical health, improving athletic skills, and developing character traits such as collaboration, discipline, and a spirit of sportsmanship (Umar et al., 2023).

One sport that is highly sought after by college students is futsal. Futsal is a high-intensity team sport that requires various aspects of physical fitness, such as speed, agility, endurance, muscle strength, and good coordination. Futsal's rapid movements, active changes of direction, and repetitive movements over a period make it an effective way to improve cardiorespiratory capacity and overall physical fitness (Doewes et al., 2022). Therefore, regular student participation in futsal can have a positive effect on improving physical condition and fitness (Sanjani et al., 2021).

Various previous studies have shown that participating in structured sports activities can have a positive impact on improving a person's health and physical fitness. Research conducted by several scientists has revealed that regular exercise can improve cardiovascular

endurance, muscle strength, flexibility, and improve body composition. Furthermore, games like futsal have been shown to increase enthusiasm for exercise due to their competitiveness, teamwork, and enjoyment. Therefore, futsal can be an effective physical activity option for improving students' physical fitness (Kowalski et al., 2021).

Various previous studies have shown that participating in structured sports activities can have a positive impact on improving a person's health and physical fitness (Ayed et al., 2024). Research conducted by several scientists has revealed that regular exercise can improve cardiovascular endurance, muscle strength, flexibility, and improve body composition. Furthermore, games like futsal have been shown to increase enthusiasm for exercise due to their competitiveness, teamwork, and enjoyment. Therefore, futsal can be an effective physical activity option for improving students' physical fitness (Singe et al., 2023).

This study provides a novel contribution by addressing a research gap in the understanding of futsal participation within the university student organization context. Previous studies have predominantly examined futsal from the perspectives of athletic performance, technical skills development, training adaptations, or competitive outcomes among athletes. However, limited attention has been given to how involvement in university futsal clubs (UKM futsal) as a structured extracurricular activity contributes to students' physical fitness development beyond competitive settings. The UKM futsal context is important because it represents a non-professional sporting environment where students engage in regular physical activity, social interaction, and organized training as part of their university experience. Therefore, this study extends existing knowledge by examining whether and to what extent the level of student involvement in UKM futsal activities is associated with physical fitness levels among university students. This approach positions futsal not only as a competitive sport but also as an educational and developmental platform that may support students' physical well-being through organized campus-based sport participation. (Jeong et al., 2025).

Therefore, the purpose of this study is to examine the impact of involvement in the Student Activity Unit (UKM) futsal on improving the physical fitness levels of students at Subang University. It is hoped that the results of this study will contribute scientifically to the advancement of physical education and sports, particularly regarding the role of student sports activities in improving physical condition. Furthermore, the results of this study are

expected to serve as a reference for universities in developing more effective student sports development programs to improve student health and quality of life.

MATERIAL AND METHODS

This study adopted a quantitative approach using a pre-experimental research design that applied the one-group pretest–posttest design method. This design was applied to evaluate the impact of participation in futsal Student Activity Unit (UKM) activities on improving students' physical fitness (Sousa-Sá et al., 2024). The population analyzed in this study includes all students at Subang University involved in futsal Student Activity Unit (UKM) activities during the current academic year. The sampling method used was purposive sampling, which selects samples based on specific criteria aligned with the objectives of this study (Stewart et al., 2025). The sample criteria applied in this study were students who actively participate in futsal UKM training regularly. This study was conducted over eight weeks, with training scheduled 2–3 times a week, following the futsal student activity unit (UKM) program at Subang University. The study began with a pretest to measure the students' physical fitness levels before undergoing the futsal training program (Sanjani et al., 2021).

Table 1. Research Implementation Schedule of the Futsal Training Program

Phase	Activity	Description	Duration/Frequency	Measurement
Preparation Phase	Participant selection and research preparation	Identification of students participating in the futsal UKM program at Subang University and preparation of research instruments	Before the intervention	Participant characteristics and research readiness
Pretest Phase	Initial physical fitness assessment	Measurement of students' physical fitness levels before participating in the futsal training program	Week 0	Baseline physical fitness data
Training Intervention Phase	Futsal UKM training program	Students participated in a structured futsal training program based on the existing UKM futsal schedule	8 weeks; 2–3 sessions/week	Training participation and activity records
Monitoring Phase	Training implementation monitoring	Observation of student participation, attendance, and adherence to the futsal training program	Throughout 8 weeks	Attendance and training consistency
Posttest Phase	Final physical fitness assessment	Measurement of students' physical fitness levels after completing the futsal training program	End of Week 8	Comparison of pretest and posttest physical fitness levels

Physical fitness testing was conducted using the Indonesian Physical Fitness Test (TKJI) or the Multistage Fitness Test (Bleep Test) to assess students' cardiopulmonary

endurance. Additionally, several elements of physical fitness, such as speed, agility, and muscular endurance, were also evaluated through appropriate physical tests.

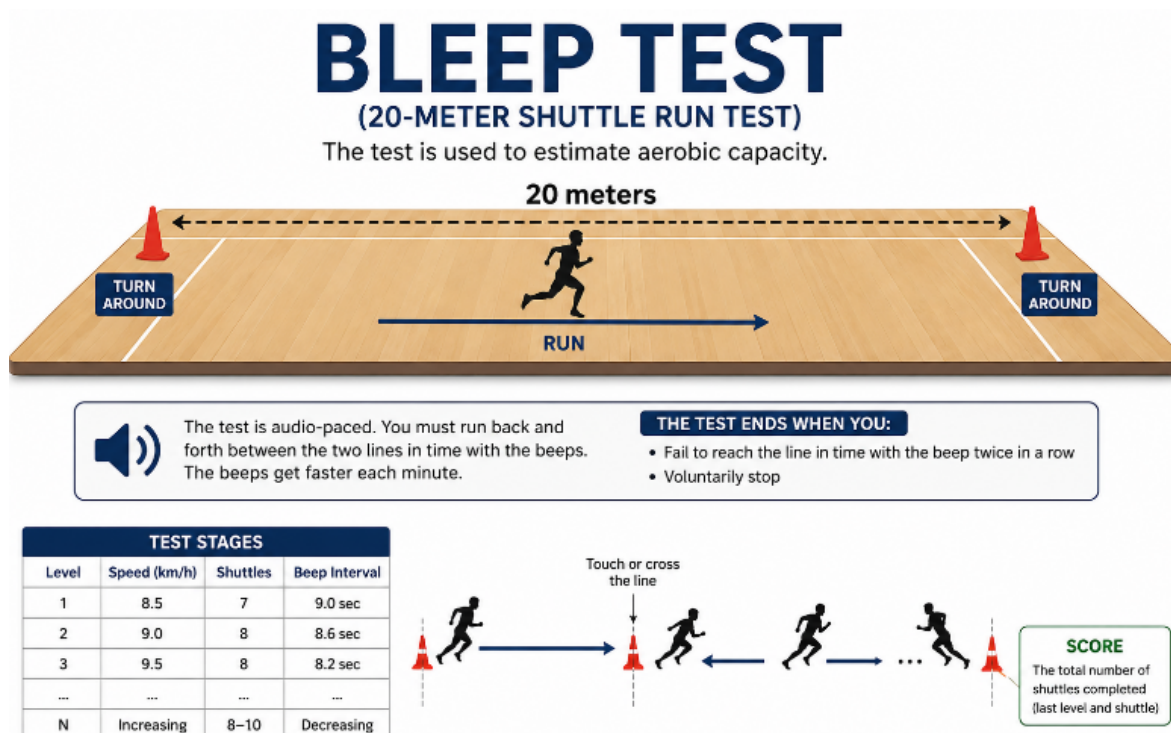


Figure. 1 Bleep Test

Following the initial exam, all participants participated in a regular futsal training program within the futsal student activity unit (UKM) (Negro et al., 2023). The training program included basic futsal training, physical fitness training, and internal futsal matches. After completing the training program during the study period, a final test was administered to evaluate changes in students' physical fitness levels following regular futsal participation.

The data obtained from the pretest and posttest measurements were analyzed using descriptive and inferential statistics. Descriptive statistics were calculated to summarize the students' physical fitness scores, including the mean, standard deviation, minimum, and maximum values for both pretest and posttest measurements.

Before conducting the inferential analysis, the assumption of normality was examined based on the distribution of the difference scores between posttest and pretest results. The Shapiro-Wilk test was used to assess the normality of the difference scores because the sample size was appropriate for this analysis. If the difference scores were normally distributed ($p > 0.05$), a paired sample t-test was performed to determine whether there was

a statistically significant difference between students' physical fitness levels before and after participating in the futsal training program. The significance level was set at $\alpha = 0.05$.

In addition, the effect size (Cohen's *d*) was calculated to determine the magnitude of the change in physical fitness following the intervention. The effect size values were interpreted to indicate the practical significance of the futsal training program beyond statistical significance. If the normality assumption was violated, the Wilcoxon signed-rank test was applied as a non-parametric alternative to the paired sample t-test. (Singe et al., 2023).

Furthermore, to understand the impact of participation in futsal student activity units (UKM) on improving students' physical condition, a paired sample t-test was used (Doewes et al., 2022). This test aimed to analyze the results of measurements taken before and after participating in the futsal training program.

All data analysis procedures were conducted using statistical software such as SPSS with a significance level set at 0.05 ($p < 0.05$). If the significance value is below 0.05=95%, it can be concluded that there is a significant effect between involvement in futsal student activity units (UKM) on improving students' physical fitness.

This study was conducted in accordance with ethical principles in research. Prior to the study, all participants were provided with information about the purpose, steps, and benefits of the study. Student participation in the study was voluntary, and all respondents indicated their informed consent to participate.

Furthermore, information obtained from participants was kept confidential and will be used solely for research purposes. This study was also conducted with due regard for the safety and health of participants during the physical fitness tests and futsal training activities.

RESULTS

After conducting research, the descriptive statistics of the pretest and posttest physical fitness scores are presented in Table 1:

Table 1. Description of Physical Fitness Research Data

No	Variabel	N	Min	Max	Mean	Std. Deviasi
1	Pre-test Physical Fitness	15	15,00	30,00	20,15	2,49189
2	Post test Physical Fitness	15	18,00	28,00	25,90	2,57243

Table 1 presents a summary of the data collection outcomes. For the physical fitness pre-test variable, the analysis included a sample size of 15 participants, with a minimum score of 15,00, a maximum score of 30,00, a mean score of 20,15, and a standard deviation of 249189. In contrast, the physical fitness post-test variable also consisted of a sample size of 15, with a minimum score of 18,00, a maximum score of 28,00, a mean score of 25,90, and a standard deviation of 2,57243.

Then, we proceeded to the Normality Test.

Table 2. Normality Test for Research Data

No	Variabel	Kolmogorov-Smirnov	Sig	Keterangan
1	Pre-test Physical Fitness	0,875	0,754	Normal
2	Post test Physical Fitness	0,687	0,865	Normal

Data is normal when the significance value exceeds 0,05 (sig > 0,05). According to the normality data presented in Table 2, the pre-test variable related to physical fitness shows a KS value of 0,875 with a significance value of 0,754, which is greater than 0,05. Therefore, due to the significance value being above 0,05, the data is classified as normal. Similarly, the post-test variable for physical fitness has a KS value of 0,687 and a significance value of 0,865, which is also above 0,05. Consequently, since the significance value is greater than 0,05, this data is likewise deemed normal.

Subsequently, we moved on to conduct the Normality Test.

Table 3. Test of Homogeneity for Results of Research Data.

No	Variabel	Levene Statistic	Sig	Keterangan
1	Pre-test Physical Fitness	0,302	0,598	Homogen
2	Post test Physical Fitness	0,271	0,617	Homogen

To assess the homogeneity test, if the significance level exceeds 0,05 (sig>0,05), the data is classified as homogeneous. Conversely, if the significance level falls below 0,05 (sig<0,05), it is deemed non-homogeneous. Table 3 illustrates that the Levene statistic for the Physical Fitness (Pre-test) dataset is 0,302, with a significance value of sig=0,598, which is greater than 0,05. This suggests that the data is homogeneous. In the case of the Physical

Fitness (Post-test) dataset, the Levene statistic is 0,271, and the significance level is sig=0,617, also greater than 0,05, indicating homogeneity as well. Consequently, it can be inferred that both data sets exhibit homogeneity, thus enabling hypothesis testing.

Then proceed to Hypothesis Testing

Table 4. Test of Hipotesis of Research Data

Variabel	Sig	T-Tabel	Keterangan
Gain test Agility	0,024	0,05	Significant

Hypothesis:

- 1) H0: Participation in the futsal student activity unit does not have a meaningful impact on enhancing physical fitness.
- 2) H1: Participation in the futsal student activity unit does have a meaningful impact on enhancing physical fitness.

Decision Criteria:

- 1) If the significance value or probability value is greater than 0.05, then H0 is accepted.
- 2) If the significance value or probability value is less than 0.05, then H0 is rejected.

The data in Table 4, derived from the computations performed using SPSS version 20, indicates that the significance value is sig = 0.024, which is less than 0.05. Therefore, the null hypothesis (Ho) is rejected, suggesting that there exists a significant impact of involvement in the futsal student activity unit on enhancing physical fitness levels.

Discussion

The results of the study indicate that student involvement in futsal Student Activity Unit (UKM) activities has a positive impact on improving students' physical fitness (Harliawan et al., 2024). This can be seen from the increase in the average physical fitness test score between the initial measurement (pretest) and the final measurement (posttest) after students regularly implemented the futsal training program during the study period (Mahfud et al., 2020). This increase indicates that regular sports activities can contribute to the development of students' physical abilities, especially in aspects of cardiorespiratory endurance, speed, and agility (Sukarno et al., 2016).

Futsal is a sport that requires moderate to high-intensity physical activity. In futsal, players must perform various actions such as running, quickly changing direction, controlling

the ball, and coordinating movements repeatedly over a period (Sousa-Sá et al., 2024). This activity can stimulate increased cardiovascular and respiratory capacity, thus positively impacting overall physical fitness. Therefore, students who regularly practice futsal tend to experience improved physical condition compared to those who rarely exercise (Syahputra & Muhathir, 2018).

The results of this study align with previous studies showing that regular physical activity can improve physical fitness and health. Planned and consistent exercise can improve cardiovascular endurance, muscle strength, and the body's ability to perform physical activities without fatigue (Burhaein, 2017). Furthermore, team sports like futsal also offer the benefit of boosting athletic spirit due to the social interaction, teamwork, and enjoyable competitive atmosphere. In addition to offering benefits for improving physical fitness, futsal student activity can also have a positive impact on students' social and psychological well-being. Group sports activities can strengthen solidarity, collaboration, and communication skills among students. This demonstrates that sports student activity not only serves to improve students' physical condition but also plays a role in developing their character and social skills within the campus environment (Ilyas & Almunawar, 2020).

However, this study has several limitations that should be considered. First, the number of participants in this study was relatively small and only included students who were members of the futsal student activity unit at Subang University, so the results obtained may not be widely applicable to the general student population (Bailey, 2006). Second, this study employed a pre-experimental design without a control group, so the influence of other factors outside of futsal activities could not be fully controlled. Third, this study only evaluated a few elements of physical fitness, so it did not comprehensively cover all aspects of students' physical condition.

Therefore, it is recommended for future research to use a larger sample size, include a control group, and evaluate more aspects of physical fitness, so that the results obtained can provide a more comprehensive understanding of the impact of sports activities on the physical fitness of students.

CONCLUSION

This study shows that students' physical fitness scores increased following their participation in the futsal Student Activity Unit (UKM) program at the University of Subang.

After completing the eight-week futsal training program, improvements were observed in several components of physical fitness, particularly cardiorespiratory endurance, speed, and agility. These findings suggest that regular participation in structured futsal activities within the university environment may be associated with positive changes in students' physical fitness. However, because this study employed a pretest–posttest design without a control group, the findings should be interpreted with caution, and further research using controlled experimental designs is needed to determine the specific effects of futsal UKM participation on physical fitness development.

The findings of this study indicate that exercise through the futsal UKM has the potential to be an effective way to encourage physical activity and improve the physical fitness of students in an academic environment. Therefore, higher education institutions are encouraged to continue supporting and developing student sports programs as part of efforts to improve their health and quality of life.

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