ACPES Journal of Physical Education, Sport, and Health 5 (2) (2025)

ACPES Journal
of Physical Education, Sport, and Health

http://journal.unnes.ac.id/journals/ajpesh

Analysis of Exercise and Health-Related Factors Affecting Student Athletes' Academic Achievement

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DOI: https://doi.org/10.15294/ajpesh.v5i2.38862

Keywords

academic achievement; exercise; health; physical fitness; student athlete

Abstract

Student athletes face dual demands to achieve academic success while maintaining athletic performance, which requires effective self-management. This study aims to analyze the factors influencing the academic achievement of student athletes at Sriwijaya University, including learning motivation, time management, physical fitness, family support, allowances and incentives, as well as the utilization of the Test Filit application for managing physical fitness data. Academic achievement, measured by Grade Point Average (GPA), served as the dependent variable. This study employed a quantitative approach with a survey design involving active student athletes at Sriwijaya University. Data were collected through structured questionnaires and physical fitness assessments conducted using the Test Filit application. Data analysis was performed using descriptive statistics and multiple linear regression analysis. The results indicate that the academic achievement of student athletes falls within the good to excellent category. Simultaneously, learning motivation, time management, physical fitness, and external support factors significantly influence academic achievement. The findings reveal that learning motivation and effective time management are dominant factors in maintaining stable academic performance, while well-managed physical fitness supports learning concentration and endurance. In addition, the use of the Test Filit application has proven effective in facilitating efficient measurement and management of physical fitness data. In conclusion, academic achievement among student athletes is influenced by a combination of internal and external factors. Institutional support through flexible academic policies, adequate sports facilities, incentive programs, and the integration of digital technology such as the Test Filit application is essential to support a balanced achievement in both academic and athletic domains.

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e-ISSN 2797-0426

INTRODUCTION

Student academic achievement is a crucial indicator in assessing the quality of education in higher education institutions. Academic achievement is commonly measured using the Grade Point Average (GPA), which reflects a student's overall performance in completing coursework throughout their period of study (Hasudungan & Pranoto, 2021). Academic achievement represents educational outcomes that encompass changes in knowledge, comprehension, application, analytical skills, synthesis, and evaluation abilities. These outcomes are assessed through tests, evaluations, or examinations for each course and are interpreted objectively in numerical or descriptive forms over a specific period (Iswinarti, 2023).

Previous studies have demonstrated that academic achievement is influenced by various factors, including motivation, mental resilience, and social support, particularly among student athletes. A student athlete refers to an individual who simultaneously fulfills the roles of both student and athlete, actively engaging in academic activities while also participating in competitive sports organized by educational institutions (Ahmad, 2023). Almost every university has students with athletic backgrounds, including Sriwijaya University. According to Sumarno and Imawati (2023), universities are perceived as centers for talent identification and athlete development. This expectation places significant pressure on student athletes, who are required to excel in sports while maintaining satisfactory academic performance. Failure to meet academic requirements may jeopardize their academic eligibility.

Physical fitness is one of the essential factors influencing both athletic and academic performance. It is defined as a set of physiological qualities related to an individual's ability to perform physical activities efficiently (Bayu et al., 2021). Physical fitness reflects the body's capacity to carry out daily tasks energetically without experiencing excessive fatigue. This definition aligns with Pardede et al. (2024), who state that physical fitness represents the body's ability to adapt to physical demands without causing significant exhaustion. Adequate physical fitness contributes positively to concentration, stamina, and mental well-being, which are essential for academic success.

In addition to physical fitness, a structured and well-planned training program plays a vital role in supporting student athletes' achievements. A proper training program should balance physical conditioning, academic demands, and competition schedules (Hartati, Solahuddin, & Irawan, 2020). Hartati et al. (2022) emphasize four key components of an effective training program: training frequency, intensity, duration, and type of activity. Training is recommended to be conducted three to five times per week, with sufficient intensity to reach 60–90% of the target heart rate reserve, and a duration of 15–60 minutes per session. Furthermore, Destriana, Elrosa, and Syamsuramel (2022) highlight that training volume, intensity, and density must be carefully managed to optimize physical and technical performance.

Factors influencing the academic achievement of student athletes can be broadly categorized into internal and external factors (Franxisca Alda Firera, 2022). Internal factors include learning motivation, time management skills, stress levels, physical and mental conditions, and cognitive abilities. High learning motivation is a key driver that enables student athletes to maintain academic performance despite facing demanding schedules (Afif et al., 2023). Effective time management is crucial in balancing academic responsibilities and sports commitments, while excessive stress resulting from academic pressure or competitive demands may negatively affect concentration and academic outcomes. External factors include family support, availability of sports facilities, incentives, and institutional support systems.

Despite the growing number of studies examining academic achievement among student athletes, research that integrates motivational factors, family support, physical fitness levels, training programs, sports facilities, incentives, and the utilization of digital applications for fitness data management remains limited, particularly in the context of Indonesian higher education. The use of digital tools, such as the Test Filit application, offers potential advantages in monitoring and managing physical fitness data systematically, yet empirical evidence on its contribution to academic achievement is still scarce.

Therefore, this study aims to analyze the factors influencing the academic achievement of student athletes at Sriwijaya University, with particular emphasis on learning motivation, family support, physical fitness levels, training programs, sports facilities, incentives, and the utilization of the Test Filit application in physical fitness data management. This research is expected to contribute both theoretically and practically by providing empirical evidence to support the development of effective

strategies and institutional policies that enable student athletes to achieve a balanced and optimal performance in both academic and athletic domains (Usra et al., 2024).

METHOD

This study employed a quantitative research approach with a survey design to examine factors influencing the academic achievement of student athletes at Sriwijaya University. The survey design was chosen to systematically collect numerical data related to internal and external factors affecting academic performance and to allow statistical testing of relationships among variables. The population of this study comprised all student athletes registered at Sriwijaya University who were prepared to participate in the National Student Sports Week (Pekan Olahraga Mahasiswa Nasional/POMNAS) in the 2025 academic year. A sample is defined as a subset of the population selected to represent the population so that the findings can be generalized (Dwi Jayanti et al., 2022). Sampling was conducted using a purposive sampling technique, which is appropriate when researchers apply specific criteria to select participants relevant to the research objectives (Hidayatulloh Rifky, 2020).

The inclusion criteria for the sample were student athletes who compete in individual sports rather than team-based sports. This criterion was applied to ensure homogeneity in training characteristics and competition demands. Sriwijaya University has several individual sports disciplines, such as pencak silat, karate, and other similar sports. Based on these criteria, a total of 60 student athletes were selected as research participants. Data collection was carried out using two primary research instruments. The first instrument was a structured questionnaire designed to measure internal and external factors influencing academic achievement, including learning motivation, time management, family support, and incentives. The second instrument involved physical fitness measurements conducted using the Test Filit application, which facilitated standardized data collection and efficient management of physical fitness data. The use of these two instruments in an integrated manner enhanced the accuracy and completeness of the data obtained.

Data analysis was performed quantitatively using both descriptive and inferential statistical techniques. Descriptive statistics were used to summarize respondent characteristics and variable distributions, while inferential statistical analysis was employed to examine the relationships between independent variables and academic achievement. Specifically, multiple linear regression analysis was applied to determine the magnitude and significance of the influence of each factor on the academic achievement of student athletes. This analytical approach was selected to provide robust empirical evidence supporting the research objectives.

RESULT AND DISCUSION

The factors measured in this study included time management, family support, physical fitness, and utilization of the Test Filit app. All of these factors were selected because they are considered to influence the balance between academic performance and athletic achievement in student athletes. Data for each factor was obtained through a questionnaire and direct measurements using the Test Filit app, providing an objective picture of the respondents' overall academic and physical condition.

Based on the research results, several important variables related to student athletes' academic performance showed a positive trend, despite facing a relatively high training load. Time management was in the moderate category, indicating that some student athletes were still adapting to managing their time between lectures and training, but had already demonstrated positive efforts in scheduling and prioritizing. Physical fitness, measured using the TestFilit application, showed that 70% of students had good fitness, which impacted stamina and concentration, thus supporting academic success. Furthermore, family support was in the high category and provided positive contributions in the form of motivation and emotional support that strengthened their enthusiasm for learning and training. In general, student athletes' academic performance was considered good, with an average GPA of 3.45, with the majority of them in the mid- to high-grade GPA category. These findings indicate that although Facing dual demands, student athletes are able to maintain good academic performance through maintained physical fitness, strong family support, and continuously improving time management.

Table 1. Descriptive Statistical Analysis Results

Variables Study	Average Score	GPA	Category	Information
The Time Management	3,6	3.40	Currently	Some students still face challenges in managing time between lectures and training. However, they have shown positive efforts in scheduling and prioritizing activities.
Physical Fitness (Fitness Test)	–	3.55	Good (70%)	Based on the measurement results using the application*Test Filit*, about 70% of students have good physical fitness"good" ego, which supports stamina and concentration in learning.
Support Out ga	4,3	3.70	High	Student athletes receive high moral and emotional support from their families, both in the form of motivation, attention, and encouragement to achieve.
Academic Achievement (GPA)	3,45	-	Good	The GPA distribution shows that 25% of students have a GPA ≥ 3.75, 55% are between 3.25–3.74, and 20% are < 3.25. In general, the academic achievement of student athletes is considered good.

Linearity Test

A linearity test was conducted to determine whether the relationship between the independent variables (time management and physical condition) and the dependent variable (academic achievement) was linear. If the relationship between the variables is proven to be linear, the analysis can be continued using linear regression techniques. The results of the linearity test are as follows:

Table 2. Linearity Test

Linieritas Table						
		Sum of Squares	df	Mean Square	F	Sig.
Between Groups	(Combined)	61,467	7	8,781	10,792	0,000
	Linearity	55,838	1	55,838	68,628	0,000
	Deviation from Linearity	5,628	6	0,938	1,153	0,366
Within Groups		17,900	22	0,814		
Total		79,367	29			

Based on the results of the linearity test using SPSS, the Sig. value was obtained.*Deviation from Linear ity* > 0.05 for all research variables. This indicates that there is no deviation from linearity, so the relationship between the variables of learning motivation, time management, and physical condition with academic achievement is linear. With a significance value of*deviation from linearity* which is greater than 0.05, it can be concluded that each independent variable has a linear relationship with academic achievement.*student athlete* Sriwijaya University. This condition fulfills one of the assumptions of linear regression, so the regression model can be used and the results of subsequent analysis can be interpreted validly.

Multiple Linear Regression Test

To test the hypothesis of time management and physical condition on academic achievement results.*stu dent athlete* using multiple regression analysis, the data obtained are as follows:

Table 3. Multiple Linear Regression Test

Uji F Linier Regresi Ganda						
Model		Sum of Squares	df	Mean Square	*F*	Sig.
1	Regression	58,458	2	29,229	37,745	,000[b]
	Residual	20,908	27	0,774		
	Total	79,367	29			

The analysis results showed a calculated F-value of 37.745 with a significance value of 0.000, which is well below the 0.05 threshold. This indicates that the regression model used in this study is feasible and can explain the relationship between all independent variables and the dependent variable. Thus, simultaneously, the variables of time management and physical condition were proven to have a significant influence on student GPA.

This section presents the research results and discussion, organized based on the research objective, which is to analyze the influence of internal and external factors on the academic achievement of Sriwijaya University student athletes. Based on the results of multiple linear regression analysis, it was found that internal and external factors simultaneously influence the Cumulative Grade Point Average (GPA) of student athletes, with varying degrees of influence for each variable (Reza et al., 2021). Partially, the test results indicate that time management and physical fitness are variables that significantly influence academic achievement, while other variables such as learning motivation, family support, sports facilities, incentives, and the use of the TestFilit application showed different influences according to statistical results (Yusfi et al., 2022).

Physical fitness emerged as the most dominant factor influencing student athlete academic achievement, as indicated by the regression coefficient value and a stronger significance level compared to other variables. Student athletes with good physical fitness tended to have higher GPAs. This suggests that good physical condition supports endurance, concentration, and learning stamina, enabling student athletes to cope with academic and athletic demands simultaneously. This finding aligns with research (Destriana et al. 2020) which states that physical fitness is positively related to student learning readiness and academic performance. The relationship between physical fitness and improved cognitive function is also supported by research (Destriani et al. 2021), which explains that good physical condition contributes to increased focus and learning efficiency in physical education students.

Time management has also been shown to significantly influence student athletes' academic achievement. The ability to manage time between lectures and training is a crucial factor in academic achievement. Student athletes who manage their schedules in a balanced manner tend to have better academic control and are able to reduce study stress (Yusfi & Destriana, 2020). This finding is supported by (Reza et al., 2022), who stated that effective time management helps student athletes maintain consistent academic performance amidst the demands of a busy training schedule. These research findings can be explained through the theoretical framework of the dual career athlete, which emphasizes the importance of balancing academic and athletic roles. Within this framework, physical fitness plays a key role in enabling student athletes to sustainably meet these two demands. This aligns with research (Iyakrus, Silaban, and Bayu, 2023), which states that good physical condition contributes to improved focus and academic performance in student athletes. Furthermore, programmed fitness training has also been shown to support the physical and mental readiness of student athletes to fulfill these dual roles (Destriana & Yusfi, 2021).

The use of the Test Fit application in this study supports the research objectives related to the use of digital technology in sports development. This application allows for objective, systematic, and efficient measurement and monitoring of physical fitness, thereby increasing the accuracy of fitness data as a basis for analyzing the relationship between physical fitness and academic achievement (Reza et al., 2023). In addition to internal factors, external factors such as family support, the availability of sports facilities, and incentives also play a role in creating an environment conducive to student-athletes' academic success. This supportive environment helps student-athletes maintain a balance between academic and athletic demands (Destriani et al., 2022). Well-managed physical activity also has a positive impact on mental health, such as reducing stress levels and improving sleep quality, which are important factors in academic success (Hartati, Destriana, & Junior, 2019).

However, this study has limitations, particularly the relatively limited sample size and the use

of a purposive sampling technique involving only individual student athletes from one university. Therefore, generalization of the results requires caution. Future research is recommended to involve a broader sample and include team sports. Practically, the results of this study provide implications for universities and coaches to develop flexible academic policies, provide adequate facilities and incentives, and utilize digital technologies such as the TestFilit application to support the balance between academic and athletic achievement for student athletes (Yusfi et al., 2023).

CONCLUSION

Based on the research findings, it can be concluded that time management and physical fitness significantly influence the academic achievement of student athletes at Sriwijaya University, with physical fitness emerging as the most dominant factor in supporting stamina, concentration, and learning endurance. Effective time management enables student athletes to balance academic and training demands through structured scheduling and clear prioritization. The use of the Test Filit application also supports academic performance by facilitating systematic monitoring and management of physical fitness. However, the findings should be interpreted cautiously due to the limited sample size and focus on individual sports at a single institution. Therefore, future studies are encouraged to involve more diverse samples and research designs. These findings highlight the importance of integrated institutional support that emphasizes both time management skills and physical fitness development to achieve balanced academic and athletic performance.

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