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# **WAYS TO OPTIMIZE STUDENTS' PHYSICAL ACTIVITY**

**SUMMARY.** A Physical activity plays a crucial role in maintaining both physical and psychological well-being. For students, regular physical activity is not only essential for overall health but also directly influences their academic performance and mental health. In today's fast-paced educational environment, students often face high levels of stress, which can negatively impact their cognitive abilities and learning efficiency. Thus, optimizing students' physical activity is a key factor in improving their overall academic success and well-being.

The purpose of this study is to explore the impact of physical activity on students' learning process. By analyzing various approaches to integrating physical exercises into daily student routines, this research aims to determine how movement and exercise contribute to better concentration, memory retention, and overall academic performance.

The object of the study is the influence of physical activity on students' academic performance. This research examines the relationship between different levels of physical activity and students' ability to focus, process information, and achieve better academic outcomes.

The practical significance of this research lies in its potential application in educational institutions such as schools and universities. By implementing strategies for optimizing physical activity, educators can enhance students' cognitive functions, reduce stress, and improve their academic achievements. The findings of this study may serve as a foundation for developing new physical education programs and policies aimed at promoting a healthier and more effective learning environment.

**KEYWORDS:** *Student well-being, Executive function, Physical activity, Academic performance.*

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## ФІЗИЧНА КУЛЬТУРА, СПОРТ ТА ФІЗИЧНА ТЕРАПІЯ

**1. Theoretical Framework**

Regular physical activity produces numerous health benefits which involve better brain function as well as enhanced mental health. Extensive research has examined how physical activity impacts academic performance among young people. Studies show that adding daily physical activity for students leads to improved academic skills in mathematics, reading, and language (Forbes, 2017).

A comprehensive analysis of 26 studies which included more than 10,000 children showed that students who participated in extra physical activity sessions lasting between 10 and 60 minutes daily achieved substantial academic advancement. Of the 18 mathematics studies reviewed, 13 found improved math skills when students engaged in physical activity led by trained instructors. Structured physical activity programs resulted in significant improvements in reading skills according to 50% of studies and language skills according to 40% of studies as reported by Forbes in 2017.

Academic achievement depends strongly upon students' cognitive capabilities. Research demonstrates how physical activity affects executive functions including working memory along with inhibition control and attention span. Research using neuroimaging by Hillman et al. (2009) showed that consistent exercise enhances both structural and functional aspects of the prefrontal cortex which is essential for executive functions. Research has shown that physical activity leads to less stress, anxiety and depression which decrease learning ability and impact academic performance negatively (Blanco-Gómez et al., 2015; Álvarez-Bueno et al., 2017).

Present research mainly examines children and the elderly populations but it's essential to start investigating how physical activity affects academic outcomes in university students. The physiological and psychological development stage of college students makes them an essential demographic for researching exercise's long-term cognitive benefits (Frontiers in Psychology, 2023).

**2. Research Methods**

This study employs a systematic review and meta-analysis approach to investigate the impact of physical activity on academic performance among university students. The research methodology follows the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) guidelines, ensuring a comprehensive and structured analysis of existing literature.

**2.1. Data Collection**

A review of 36 relevant studies was conducted, sourced from databases such as SPORTDiscus, ERIC, the British Education Index, Scopus, Embase, Web of Science, and PubMed.

Studies published up to September 2023 were included.

Both subjective and objective measures of physical activity were considered.

The research focused on associations between physical activity levels and academic performance in university students.

## 2.2. Data Analysis

A random effects meta-analysis was performed to determine the statistical significance of the relationship.

The Newcastle Ottawa Scale was used to assess the risk of bias in the included studies.

Studies were categorized based on the type of intervention: structured physical education programs, extracurricular activities, and integrated classroom-based physical activity.

## 3. Analytical Findings

The meta-analysis of six selected studies revealed a significant association between high levels of physical activity and improved academic performance. The odds ratio (OR) for students with high physical activity levels achieving better academic outcomes was 3.04 (95% CI = 1.84-5.02;  $P \leq 0.001$ ), indicating that students who engaged in more physical activity were more than three times as likely to perform well academically compared to those with lower activity levels (PubMed, 2023).

However, the narrative analysis of all 36 studies yielded mixed results:

50% of studies found a positive association between physical activity and academic performance.

The remaining studies reported no significant relationship, suggesting variability in how physical activity influences academic outcomes.

The impact of physical activity appeared to be stronger when structured programs were led by trained instructors.

Aerobic exercise was particularly effective in enhancing executive functions such as working memory and cognitive flexibility (Chen et al., 2011; Liu et al.).

Moreover, the study highlights the role of self-efficacy as a mediating factor between physical activity and academic success. Engaging in regular exercise fosters confidence, resilience, and motivation, which in turn enhance cognitive function and academic performance (Bandura, 1987; McAuley et al., 1993).

## 4. Discussion of Results

The findings of this study align with previous research demonstrating the positive effects of physical activity on cognitive and academic performance. However, several factors influence the extent of this impact:

**Intensity and Duration of Physical Activity** – More intense and structured exercise programs tend to yield greater cognitive benefits.

**Instructor Training** – Programs led by trained professionals showed stronger academic improvements compared to unstructured activities.

**Type of Physical Activity** – Aerobic exercise, which enhances executive functions, proved to be the most beneficial for students' academic success.

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## ФІЗИЧНА КУЛЬТУРА, СПОРТ ТА ФІЗИЧНА ТЕРАПІЯ

Emotional Well-being – Regular physical activity helps reduce stress and anxiety, contributing to a more positive learning environment (Blanco-Gómez et al., 2015; Wang et al., 2023).

Despite these promising results, some studies failed to find a significant link between physical activity and academic performance. This could be due to:

Differences in measurement methods (subjective vs. objective).

Variability in academic performance indicators used across studies.

Potential confounding factors such as sleep patterns, nutrition, and socioeconomic status.

Future research should focus on:

- Standardizing measurement tools for physical activity and academic success.
- Exploring the long-term effects of regular physical activity on cognitive function.

Investigating individual differences (e.g., gender, academic discipline) in responsiveness to physical activity.

**Conclusion**

This study highlights the significant relationship between physical activity and academic performance, particularly among university students. The findings suggest that students who engage in regular physical exercise, especially structured programs led by trained instructors, demonstrate improvements in cognitive functions such as memory, attention, and problem-solving skills. Additionally, increased physical activity contributes to emotional well-being by reducing stress, anxiety, and depression, further enhancing students' ability to focus and perform academically.

The meta-analysis revealed a statistically significant correlation between high levels of physical activity and better academic performance. However, the narrative review of studies presented mixed results, with some research failing to establish a direct connection. This inconsistency highlights the need for further investigation into the long-term effects of physical activity, the role of different exercise types, and individual factors that may influence academic outcomes.

Despite some conflicting findings, the practical implications of this research are clear: integrating well-structured physical activity programs into university settings can enhance students' learning experiences, boost self-efficacy, and foster a healthier academic environment. Future studies should explore more objective measurements of physical activity and its direct impact on academic performance, as well as identify the optimal duration and intensity of exercise to maximize cognitive benefits.

By promoting regular physical activity among students, educational institutions can contribute to both their mental and physical well-being, ultimately leading to improved academic success. Implementing these strategies in schools

and universities could serve as a valuable approach to optimizing students' overall educational experience.

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