Physical Activity and Its Relationship with The Academic Performance of University Students

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KEYWORDS

Academic Performance, Physical Activity, Higher Education.

ABSTRACT

A documentary review was carried out on the production and publication of research papers related to the study of the variable Physical Activity and Academic Performance. The purpose of the bibliometric analysis proposed in this document was to know the main characteristics of the volume of publications registered in the Scopus database during the period 2017-2022 by Latin American institutions, achieving the identification of 134 publications. The information provided by this platform was organized through graphs and figures categorizing the information by Year of Publication, Country of Origin, Area of Knowledge and Type of Publication. Once these characteristics have been described, the position of different authors regarding the proposed theme is referenced through a qualitative analysis. Among the main findings made through this research, it is found that Brazil, with 53 publications, was the Latin American country with the highest scientific production registered in the name of authors affiliated with institutions in that nation. The Area of Knowledge that made the greatest contribution to the construction of bibliographic material related to the study of Physical Activity and Academic Performance was Medicine with 81 published documents, and the most used Type of Publication during the period indicated above were Journal Articles with 88% of the total scientific production.

1. Introduction

A topic of growing importance in higher education characterized by improving academic performance among students has been evidenced a close relationship between this academic interest and physical activity. In the field of being able to scale academic processes to find increasingly competitive excellence, the internal entities of universities and professors have set their focus on a holistic vision which encompasses not only cognitive development, but also ensures the physical well-being of students. This relationship arises from previous research which affirms that constant physical activity not only brings well-being to people's health, but also has profound implications for cognitive functions and academic performance.

The university period is a critical phase in the life of each person, since it starts from a state of transition in search of academic adaptability, new educational challenges and adjusting their lifestyle. Amid rigorous academic demands, students often face stress, fatigue, and mental health issues. It is crucial to understand the potential impact of physical activity on academic performance. The nature of these two forces would not only involve exploring the cognitive benefits under physical performance but also observing their long-term effects on academic interest, retention, and overall well-being.

The epicenter of this research is premised on the fact that physical activity not only represents well-being in health, but also significantly contributes a fundamental aspect in the lifestyle of university students that influences their ability to participate proactively and effectively improve academic obligations. This research suggests that regular exercise has the potential to improve cognitive functions such as attention, memory, and information processing speed, all of which are integral to academic success. The benefits of physical activity are not only reflected in cognitive development immediately, but also improve the mood of those present, greater resilience, sleep quality and improve the stress states that students face every day throughout their career, creating a more optimal environment for learning processes.

As we navigate the effects of globalization, the educational landscape continues to change, universities recognize the importance of fostering a campus that supports the holistic development

of students. Universities in general are increasingly incorporating wellness initiatives, fitness programs, and recreational facilities on their campuses, recognizing the correlation between physical health and academic performance. This seeks to cultivate a healthier and more active environment for students, promoting a culture of general interest where the close relationship between physical and mental well-being is evident.

By synthesizing the present research, delving into the various dimensions between these two forces, cognitive and physical, annexing potential future mechanisms to the long term, and considering the broader implications, we intend to shed light on the intricate interaction between an active lifestyle and school success. As we navigate the nuances of this relationship, it becomes apparent that fostering a culture of physical activity in university settings is not only an investment in student well-being but a strategic approach to nurturing a generation of academics who are not only academically adept, but also physically resilient and emotionally balanced. For this reason, this article seeks to describe the main characteristics of the compendium of publications indexed in the Scopus database related to the variables Physical Activity and Academic Performance, as well. Such as the description of the position of certain authors affiliated with institutions, during the period between 2017 and 2022.

2. General Objective

To analyze, from a bibliometric and bibliographic perspective, the preparation and publication of research papers in high-impact journals indexed in the Scopus database on the variables Physical Activity and Academic Performance during the period 2017-2022 by Latin American institutions.

3. Methodology

This article is carried out through a mixed orientation research that combines the quantitative and qualitative method.

On the one hand, a quantitative analysis of the information selected in Scopus is carried out under a bibliometric approach of the scientific production corresponding to the study of Physical Activity and Academic Performance, Higher Education. On the other hand, examples of some research works published in the area of study indicated above are analyzed from a qualitative perspective, based on a bibliographic approach that allows describing the position of different authors regarding the proposed topic. It is important to note that the entire search was carried out through Scopus, managing to establish the parameters referenced in *Figure 1*.

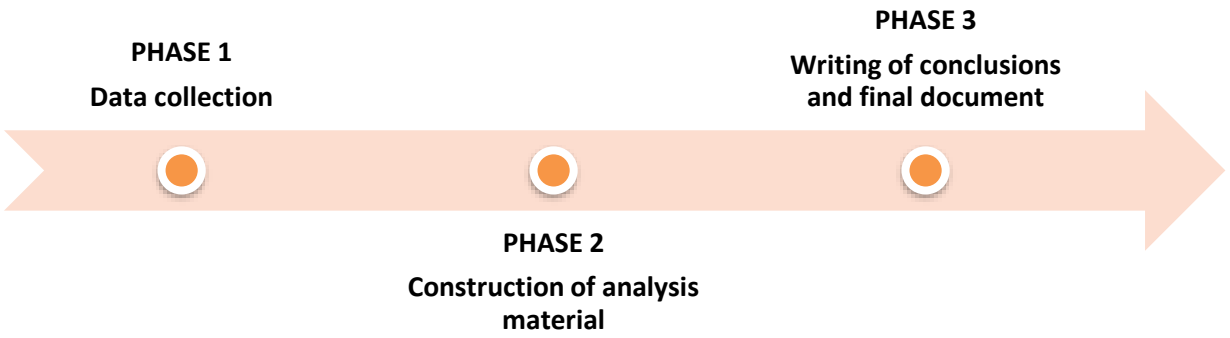

Figure 1. *Methodological design*

Source: Own elaboration

Phase 1: Data Gathering

Data collection was carried out from the Search tool on the Scopus website, where 134 publications were obtained from the choice of the following filters:

Advanced query

TITLE-ABS-KEY (physical AND activity, AND academic AND performance) AND PUBYEAR > 2016 AND PUBYEAR < 2023 AND (LIMIT-TO (AFFILCOUNTRY , "Brazil") OR LIMIT-TO (AFFILCOUNTRY , "Chile") OR LIMIT-TO (AFFILCOUNTRY , "Colombia") OR LIMIT-TO (AFFILCOUNTRY , "Mexico") OR LIMIT-TO (AFFILCOUNTRY , "Peru") OR LIMIT-TO (AFFILCOUNTRY , "Ecuador") OR LIMIT-TO (AFFILCOUNTRY , "Venezuela") OR LIMIT-TO (AFFILCOUNTRY , "Argentina") OR LIMIT-TO (AFFILCOUNTRY , "Cuba") OR LIMIT-TO (AFFILCOUNTRY , "Panama"))

- Published documents whose study variables are related to the study of the variables Physical Activity and Academic Performance
- Limited to the years 2017-2022.
- Limited to Latin American countries.
- Without distinction of area of knowledge.
- Without distinction of type of publication.

Phase 2: Construction of analysis material

The information collected in Scopus during the previous phase is organized and then classified by graphs, figures and tables as follows:

- Co-occurrence of words.
- Year of publication.
- Country of origin of the publication.
- Area of knowledge.
- Type of publication.

Phase 3: Drafting of the conclusions and final document

In this phase, the analysis of the results previously yielded is carried out, resulting in the determination of conclusions and, consequently, the obtaining of the final document.

2. Results and Discussion

Word co-occurrence

Figure 2 shows the co-occurrence of keywords found in the publications identified in the Scopus database.

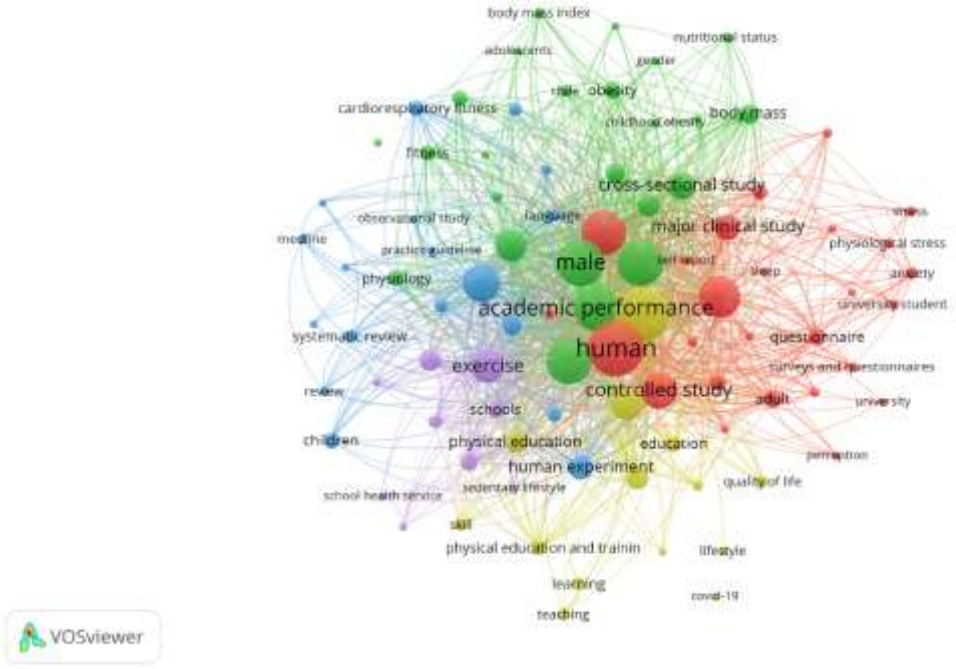

Figure 2. *Word co-occurrence*

Source: Own elaboration (2023); based on data exported from Scopus.

Academic Performance was the keyword most frequently used within the studies identified through the execution of Phase 1 of the Methodological Design proposed for the development of this article. Universities is among the most frequently used variables, associated with variables such as Physical Activity, Cognitive System, University Students, Teachers, Innovative Technology, Learning System. From the above, it is striking, Modifying the traditional paradigms already established seeks to forge a new horizon for future generations of professionals where not only academic achievements are taken into account but also to forge people with good physical performance and good mental health, capable of facing future challenges and the difficulties present in academic life. The social connection that is established through physical activity can also contribute to better academic performance. Participation in sports or group activities not only promotes social interaction, but also encourages teamwork and building positive relationships among students. A supportive social environment can create a sense of belonging that positively influences emotional well-being, which, in turn, can translate into more consistent academic performance.

Distribution of scientific production by year of publication

Figure 3 shows how scientific production is distributed according to the year of publication.

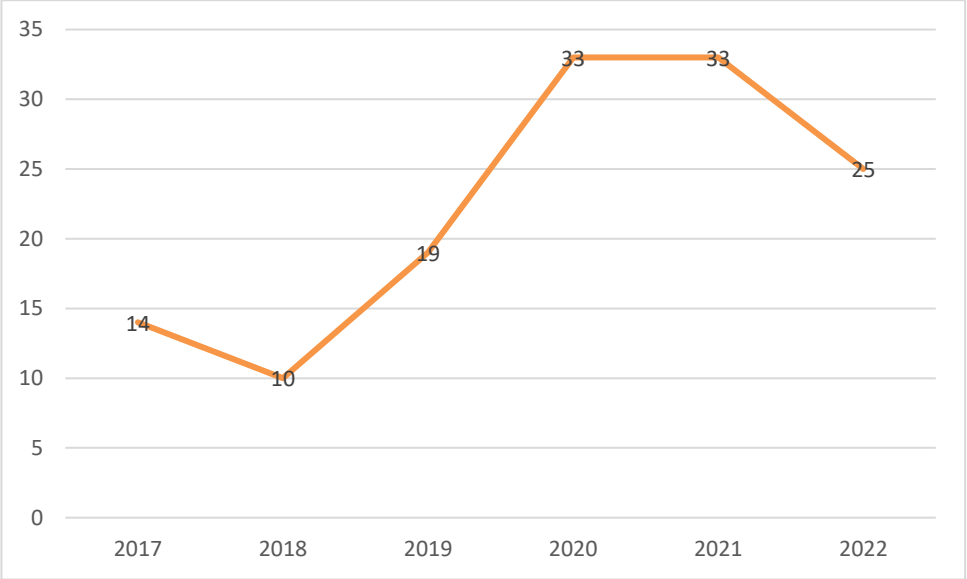

Figure 3. *Distribution of scientific production by year of publication.*

Source: Own elaboration (2023); based on data exported from Scopus

Among the main characteristics evidenced by the distribution of scientific production by year of publication, a level of number of publications registered in Scopus was the years 2020-2021, reaching a total of 33 documents published in journals indexed on said platform. This can be explained thanks to articles such as the one entitled "Perception of cognitive functions and academic performance in Chilean public schools". The objective of this study was to analyze the association between the perception of cognitive functions, such as memory, processing speed, attention, execution of complex tasks and nervousness, and academic performance in Chilean schoolchildren in the province of Biobio. A cross-sectional analytical design was performed. The sample was composed of 590 primary school students (12 ± 1.3 years; 48.3% female) from Chilean public schools. Academic performance was measured by cumulative final grades in language, mathematics, physical education, and health, and each student's grade point average (GPA). In addition, a survey was applied to measure the cognitive functions of the participants. The results show that 20.3% of the students perceived themselves as very nervous and 16.8% felt distracted. Differences were observed in grades in all subjects measured, as well as in GPA, depending on the perception of cognitive functions. Thus, students with low to moderate perceptions of their cognitive functions received lower scores than those who reported high perception. These results were consistent after a multivariate analysis adjusted by a model of socio-educational variables.(Valdebenito-Villalobos, 2022)

Distribution of scientific production by country of origin

Figure 4 shows how scientific production is distributed according to the country of origin of the institutions to which the authors are affiliated.

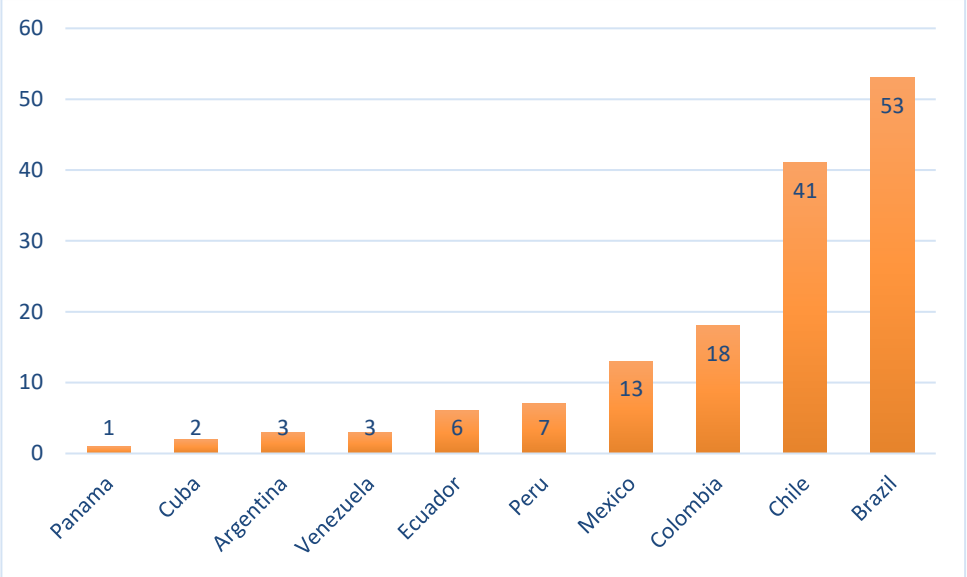

Figure 4. *Distribution of scientific production by country of origin.*

Source: Own elaboration (2023); based on data provided by Scopus.

Within the distribution of scientific production by country of origin, records from institutions were taken into account, establishing Brazil as the country of that community, with the highest number of publications indexed in Scopus during the period 2017-2022, with a total of 53 publications in total. In second place, Chile with 41 scientific documents, and Colombia occupying the third place presenting to the scientific community, with a total of 18 documents among which is the article entitled "Academic performance, physical activity, sleep and gender in university students during the pandemic-2020" The objective of this study was to evaluate the association between academic performance, physical activity and sleep quality and to determine the existing differences by gender in Physical Education Pedagogy students during the pandemic in 2020. This study was designed as a multicenter, cross-sectional study. of 278 university students from Santiago, Talca and Temuco, Chile. An online survey was administered from July to December, which included questions on physical activity (International Physical Activity Questionnaire (IPAQ), sleep quality (Pittsburgh Sleep Quality Index), and sociodemographic information. The results show that women presented better academic performance, worse sleep quality and similar physical activity-MET than men. Women (β = 0.26, 95% CI 0.10 to 0.43 points, p = 0.002) and university students who presented a worse indicator of subjective sleep quality (β = 0.11, 95% CI 0.02 to 0.20 points, p =. 014) obtained better academic performance in the context of COVID-19. There was no association between academic performance and physical activity. It is essential to look for strategies that allow students to have adequate academic performance and promote healthy habits in this population.(Bustamante-Ara, 2022).

Distribution of scientific production by area of knowledge

Figure 5 shows the distribution of the preparation of scientific publications based on the area of knowledge through which the different research methodologies are implemented.

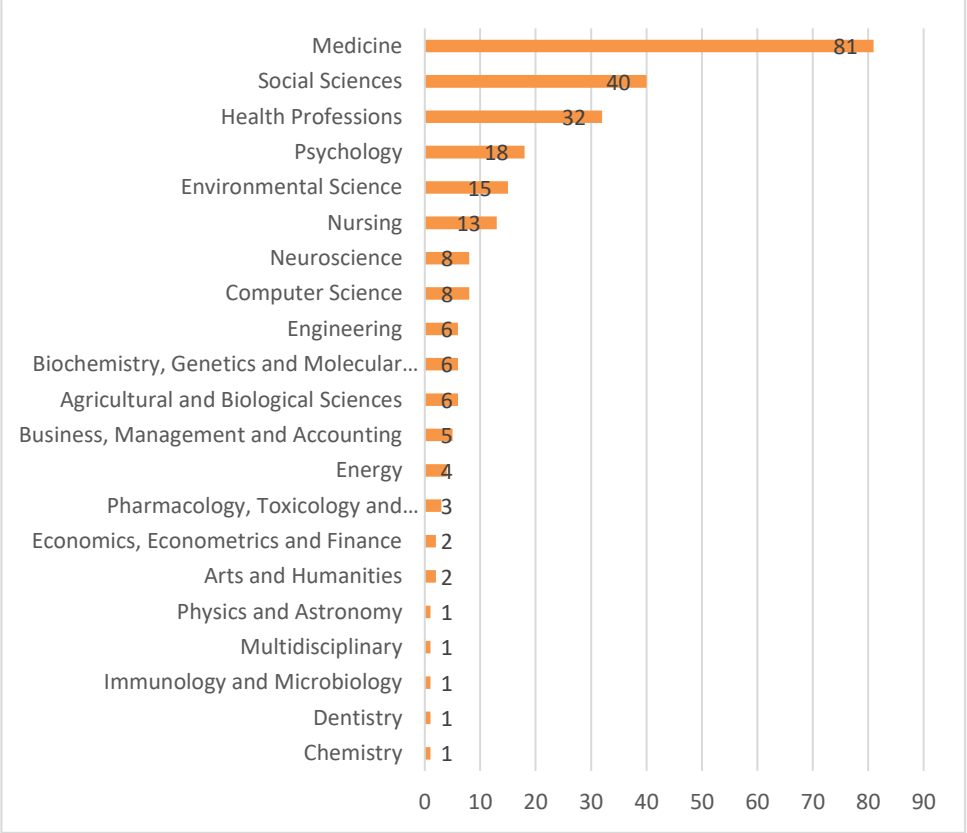

Figure 5. *Distribution of scientific production by area of knowledge.*

Source: Own elaboration (2023); based on data provided by Scopus

Medicine was the area of knowledge with the highest number of publications registered in Scopus with a total of 81 documents that have based its methodologies Physical Activity and Academic Performance. In second place, Social Sciences with 40 articles and Health Profession in third place with 32. The above can be explained thanks to the contribution and study of different branches, the article with the greatest impact was registered by Medicine entitled "Management of the teaching-learning process: learning styles and academic performance." The objective of this research is to characterize the relationship between learning styles and the academic performance of undergraduate students of the Pedagogy of Physical Activity and Sports career, so that teachers can contribute to the teaching-learning process, adapting methodological strategies. understand how the student learns. A non-experimental, descriptive, cross-sectional, quantitative study was carried out through the application of an instrument to 579 students from all semesters of the career. It is revealed that the theoretical learning style is the most prevalent in the students of the career and this significantly positively influences academic performance, this will allow future decisions to be made regarding the teaching methods to be applied in the development of knowledge of the different subjects and contribute to the academic improvement of the future education professional.(Mendoza Yépez, 2022)

Type of publication

In the following graph, you will see the distribution of the bibliographic find according to the type of publication made by each of the authors found in Scopus.

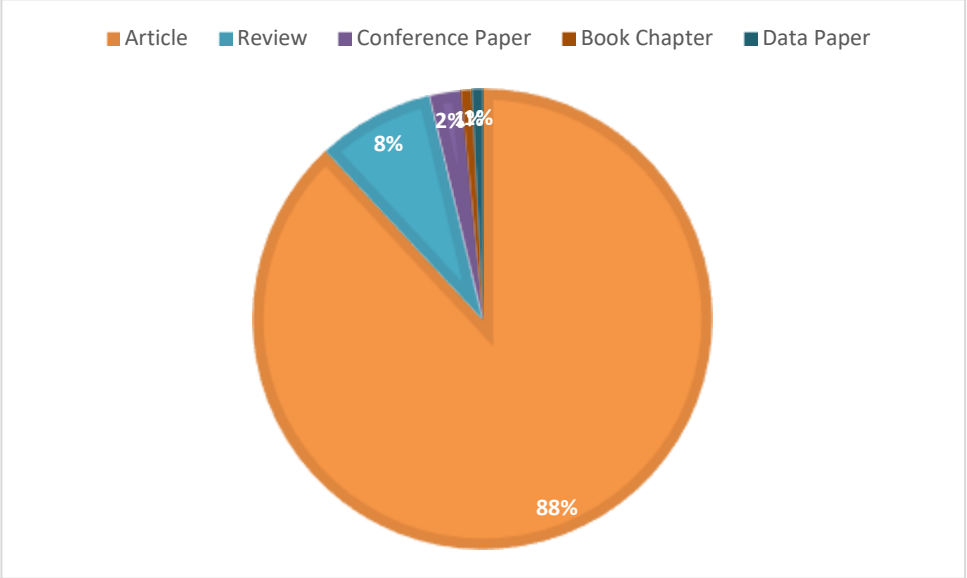

Figure 6. *Type of publication.*

Source: Own elaboration (2023); based on data provided by Scopus.

The type of publication most frequently used by the researchers referenced in the body of this document was entitled Journal Articles with 88% of the total production identified for analysis, followed by Journal with 8%. Session Papers are part of this classification, representing 2% of the research papers published during the period 2017-2022, in journals indexed in Scopus. In this last category, the one entitled "Association of psychological and health factors with academic performance and nonverbal intelligence in university students with low academic performance: the influence of sex" stands out. The objective of this study was to make an association of health, psychological and personal variables with the academic average and nonverbal intelligence in the population of low academic performance according to sex. We invited university students of health sciences who had failed the same subject twice to complete a set of sociodemographic and psychological variables and a nonverbal intelligence test. GPA, admission exam test, and preparatory GPA were obtained. We included 124 students and found that GPA was associated with nonverbal intelligence in women but not in men; in whom having a job and having a romantic partner were more correlated. In women, positive relationships with others, perception of emotions, and weekly hours of physical activity were marginally correlated with GPA; while in men, emotion regulation and self-motivation tended to correlate with GPA. In addition, we found that nonverbal intelligence was associated with somatization and the number of diseases in women. Academic performance is regulated by different variables in each sex; therefore, intervention programs addressed by sex are needed to increase it.(Brambila-Tapia, 2022).

3. Conclusion and future scope

Through the bibliometric analysis carried out in this research work, it was possible to establish that Brazil was the country with the highest number of records published for the variables Physical Activity and Academic Performance. With a total of 53 publications in the Scopus database. In the same way, it was possible to establish that the application of theories framed in the area of Medicine, were used more frequently in the benefits that physical activity brings with it in the academic performance of students in universities. Based on this, the potential and cognitive benefits of performing physical activity should not be underestimated. Research shows that in addition to how beneficial performing some physical activity is usually for health, it in turn improves several aspects of people's cognitive function, including memory, attention levels and greater execution of academic problems. These improvements can have a direct impact on a student's ability to absorb, process, and retain information, essential components of academic success. It is important to highlight the benefits of physical activities in students since it brings with it mental well-being that in turn brings benefits

to academic performance. When performing these activities, it alleviates problems associated with mental health. This is evidenced since at the time of executing a physical practice, stress hormones are reduced, promoting the release of endorphins which are healthy for emotional expression. Students who engage in physical activity are better equipped to handle the rigors of academic life, improving their overall resilience and coping mechanisms. The aim is for universities to achieve a healthy lifestyle among students through physical activity during the years of university schooling so that these habits have a possible impact on a large scale over time. A regular exercise routine instills discipline and time management skills that are transferable to academic responsibilities. Adopting a healthy lifestyle at an early age can contribute to the prevention of chronic diseases, ensuring that students are well prepared physically and mentally to face the demands of their future projects. The autocorrelation between physical activity and academic performance in universities is a powerful testimony to the holistic horizon present in education. This substantially improves not only the physical part but also the mental, improving their cognitive abilities and thus finding an existing balance among university students. As higher education institutions continue to strive for the holistic development of their students, integrating and encouraging physical activity within the academic framework becomes not only desirable but imperative.

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