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THE IMPACT OF PHYSICAL EDUCATION ON ACADEMIC ACHIEVEMENT: A COMPREHENSIVE ANALYSIS

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Abstract

This study explores the connection, between participating in education classes and academic performance among a diverse group of individuals aged 30 to 55. The introduction emphasizes the standing importance of education in educational programs and the need for a detailed investigation into its impact on cognitive and academic outcomes. The literature review examines perspectives, theoretical frameworks and existing research gaps to establish a foundation for the study. In terms of methodology, a quantitative approach is used with 100 participants from demographics. The findings reveal a correlation (r = 0.848) and a significant regression model (R square = 0.719) highlighting the link between engagement in physical education and higher academic achievement. The discussion provides an interpretation of these results within a context acknowledging the diversity among the participants while the conclusion summarizes findings and emphasizes their implications, for educational policies. This research contributes to the understanding of how physical education promotes student development and academic success.

Key Words: ***Physical Education, Academic Achievement, Cognitive Development, Educational Impact, Student Well-being etc.***

Introduction

Physical education (PE) is part of systems serving the important role of promoting physical health and impacting cognitive and academic performance. Recognizing the advantages of PE, it has been incorporated into school curricula worldwide with the aim of fostering fitness and supporting overall student growth (Cocca et al. 2021). However, there is debate surrounding the complex relationship between active involvement in physical education and academic success.

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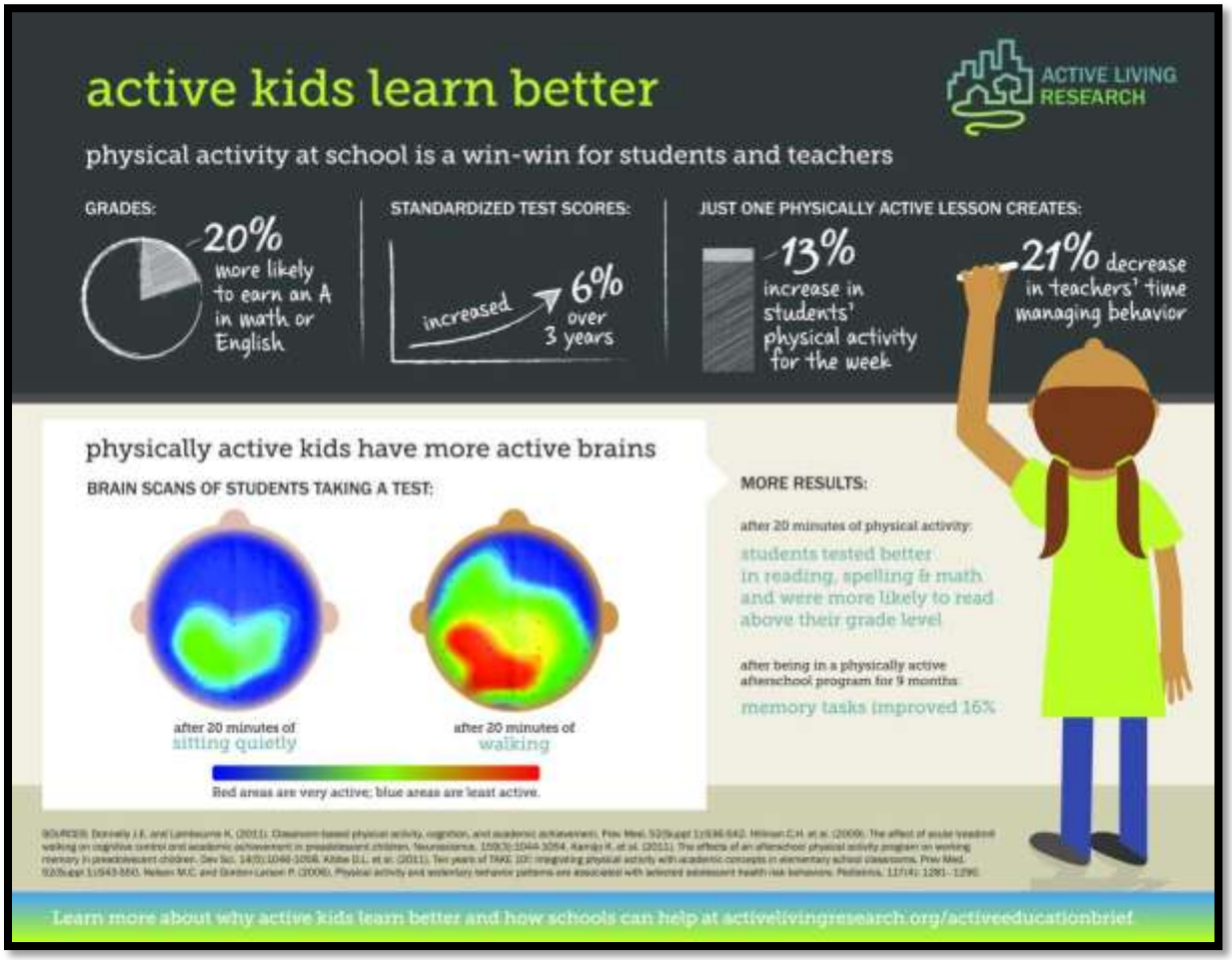

Figure 1: Physical activity influences academic performance

(Source: Bell et al. 2019)

As per the above image, physically active kids have more active brains that not only help in effective learning aspects but also help in academic performance enhancement aspects. The need to explore this relationship in a nuanced way arises because there are factors that influence it. In that case, there are still questions about how physical education can contribute to development and academic success. (Bell et al. 2019). The purpose of this research is to untangle these complexities and shed light on the dynamics that define the impact of education on academic achievement.

This research aims to examine how physical education affects achievement providing valuable insights, for educators, policymakers and those involved in the field of education.

Research Objectives of this study are

- To gauge the link between regular participation in physical education classes and academic achievement.
- To investigate the impact of physical education on academic performance and behavioural engagement in the classroom.
- To investigate the connection between physical fitness and academic achievement
- To explore gender-based distinctions in the influence of physical education on academic achievement.

Research Questions of this study are

- What is the correlation between regular participation in physical education classes and academic achievement?
- How does physical education contribute to cognitive abilities and behavioural engagement in academic settings?
- What is the relationship between physical fitness levels and academic performance?
- In what ways do gender-based differences influence the impact of physical education on academic achievement?

Hypotheses associated with this study are discussed below.

Hypothesis 1: Participation in physical education positively influences classroom behaviour and increases academic engagement.

Null Hypothesis: There is no significant impact of participation in physical education on classroom behaviour and academic engagement.

Literature Review

Correlation Between Participation in Physical Education and Academic Achievement

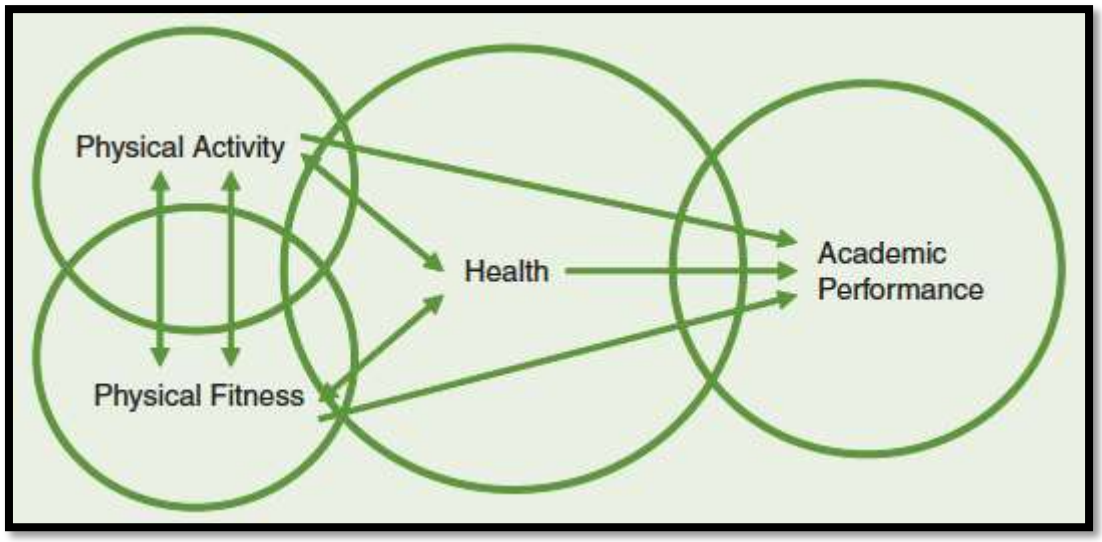

Figure 2: Relationship Between Physical Education and Academic Performance
(Source: Galikyan & Admiraal, 2019)

The connection between participation in education (PE) and academic success is an area of study in education research. Exploring this link has the potential to provide information for policies and practices. As per the study by Estevan et al. (2021), one important focus is to identify the effects that regular engagement in PE can have investigating whether students who actively participate in PE classes demonstrate levels of achievement. This analysis looks not only at grades but also considers indicators of educational success. On the other hand, Galikyan & Admiraal (2019) stated that by examining levels of participation, educators can identify thresholds where the impact on academic achievement becomes more significant. This aspect is crucial for establishing evidence-based recommendations for educators and policymakers. Understanding how often students should engage in PE to maximise their outcomes can guide targeted interventions and adjustments to the curriculum. In summary, this research sheds light on the relationship between PE involvement and

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academic achievement providing insights that contribute to students' overall development, within the educational system.

Contribution of Physical Education to Cognitive Abilities and Behavioural Engagement

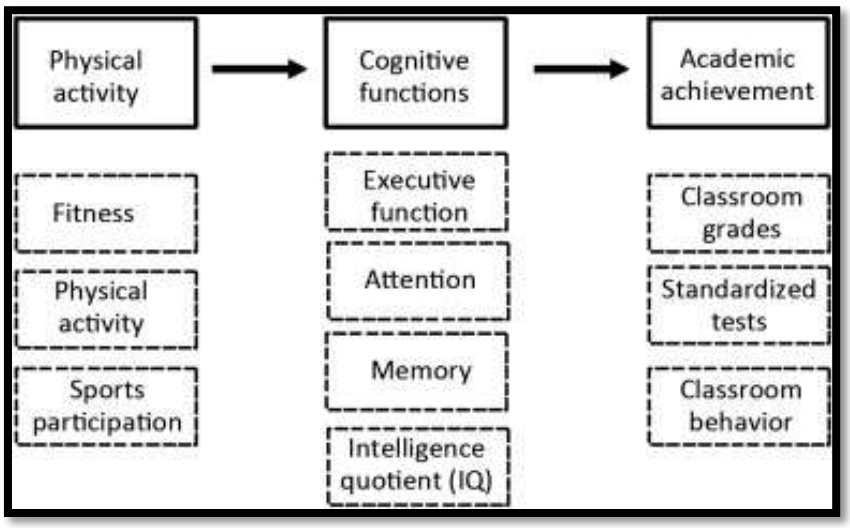

Figure 3: Physical Education's Contribution to Cognitive Abilities and Behavioural Engagement

(Source: García-Hermoso et al. 2021)

The impact of education (PE), on abilities and student engagement is an important area of study that has significant implications for educational practices. This examination aims to examine the effects of PE specifically focusing on identifying the benefits that directly influence academic performance. By analysing improvements in attention, memory and executive functions this study aims to develop an understanding of how PE influences students' cognitive abilities (García-Hermoso et al. 2021). Additionally, this exploration goes beyond measurements by recognizing the overall cognitive development that can be facilitated through PE.

Through assessing the relationship between participation in PE and behaviours such as attentiveness, active involvement and task completion researchers aim to uncover the transferability of skills developed in PE settings to contexts. Understanding these dynamics not only contributes to optimising PE programs but also provides insights for enhancing student engagement and performance across various academic settings. Essentially this study seeks to unravel the connections between education, cognitive abilities and student engagement while shedding light on their broader implications, for educational strategies.

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Relationship Between Physical Fitness Levels and Academic Performance

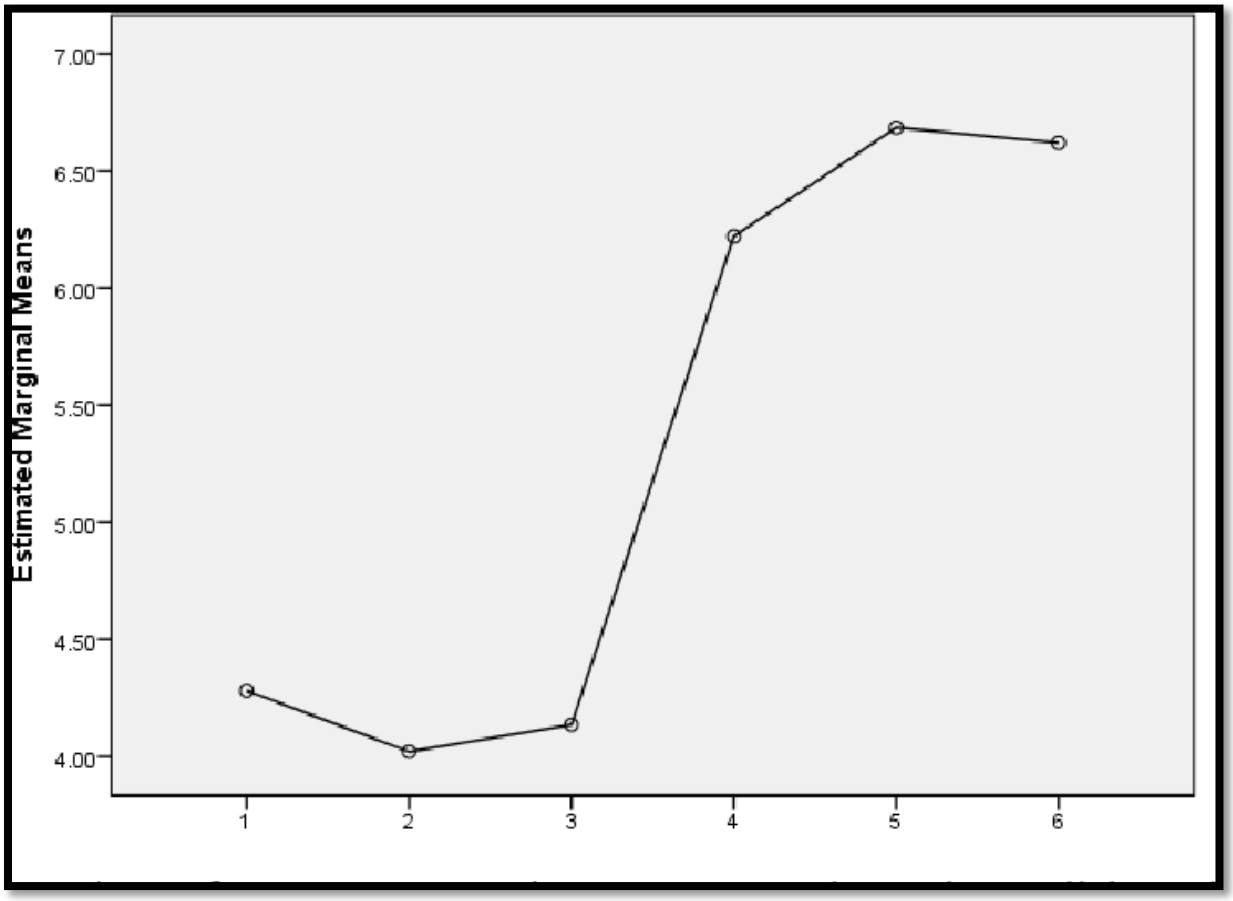

Figure 4: Relationship Between Physical Fitness Levels and Academic Performance
(Source: Foglesong, 2021)

Understanding the connection between fitness and performance is crucial to fully grasp how physical education affects students as a whole. To gain an understanding students analyse fitness indicators like cardiovascular endurance and strength in order to find correlations with academic achievements (Foglesong, 2021). This detailed examination aims to identify the attributes that may directly impact academic outcomes. By pinpointing these fitness indicators educators and policymakers can customise education programs to prioritise activities that promote the development of these attributes potentially maximising the academic benefits derived from such programs.

By monitoring changes in fitness levels over a period and linking those changes with progress this study aims to uncover possible cause-and-effect relationships. Such insights can guide the creation of targeted interventions highlighting the importance of maintaining and improving fitness throughout a student's journey. Essentially this research strives to bridge the gap between fitness and academic performance providing knowledge for shaping educational strategies that foster comprehensive student well-being.

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Challenges associated with physical activity for academic performance

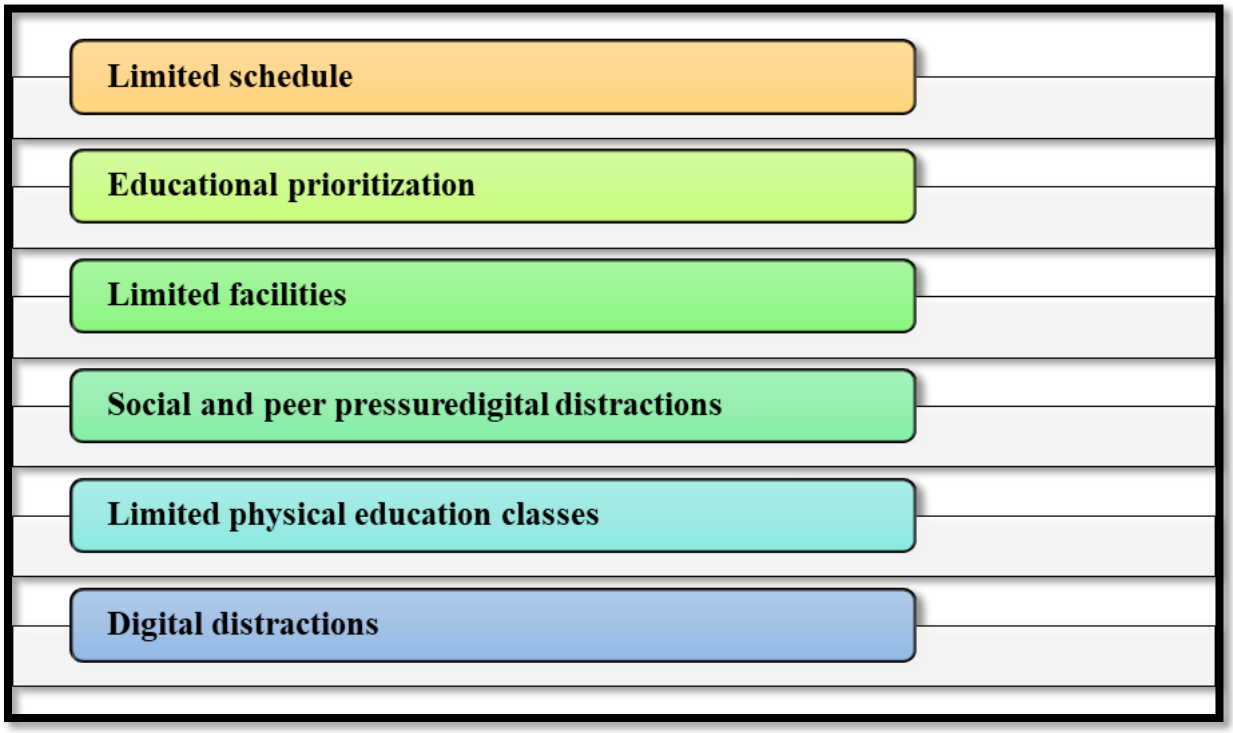

Figure 5: Academic Performance Challenges Stemming from Physical Activity
(Source: Aubert et al. 2022)

Finding a balance between staying active and excelling academically can be quite challenging for students at all levels of education. One major hurdle is the amount of time as academic commitments like classes, homework and extracurricular activities often leave little room for regular physical exercise (Chang, 2022). Moreover, during exam periods the pressure to perform well academically can further limit opportunities for engaging in activities. Many students face the dilemma of prioritising academics over their well-being. The lack of infrastructure and access also adds to this struggle. Schools and educational institutions with sports facilities or gymnasiums make it difficult for students to engage in physical activity (Aubert et al. 2022). Additionally, urban planning that doesn't promote exercise exacerbates the problem. Social and peer pressures play a role too as socialisation and concerns about body image discourage some students from taking part in activities.

Parental expectations that prioritise success over activity, coupled with the influence of technology leading to excessive screen time contribute to a more sedentary lifestyle among students. Institutional policies such as reduced emphasis on education in the curriculum or limited access to physical activities further complicate matters.

Strategies to mitigate Challenges that improve the students' engagement

To address the difficulties of balancing performance and physical activity a comprehensive approach is needed. Educational institutions can introduce programs that set aside time for physical education enabling students to have dedicated periods for exercise. On the other hand, Subić & Simonović (2019) stated that by establishing well-equipped sports facilities within school premises infrastructure limitations can be overcome. Furthermore, fostering a culture that values both academic accomplishments and physical achievements

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can be achieved through awareness campaigns promoting the idea that physical activity is complementary to success rather than conflicting with it.

Involvement from parents is crucial in this endeavour with initiatives aimed at educating them about the benefits of maintaining a lifestyle. Educational policies should also emphasise the significance of education that ensure sufficient resources are allocated for its inclusion in curricula. Lastly, leveraging technology in a way such as integrating activity apps or encouraging active breaks during screen time can motivate students to remain physically active even when faced with academic demands (Gao & Lee, 2019). Successful mitigation of these challenges requires an effort involving educators, parents, policymakers and students themselves.

Methodology

This study used a primary research method where primary data collection was collected through an online survey. This study conducted a survey, with 100 participants from levels of education ranging from different academic centres where teachers offered their valuable information on this study. These participants will answer a questionnaire about their involvement in education, academic performance and how they perceive the impact on their cognition and behaviour. To analyse the data comprehensively this study used software called IBM SPSS (Coenen, Batterham & Beck, 2021). The analysis would include statistics to summarise the trends, correlation analysis to explore the relationship between participation in physical education and academic achievement and regression analysis to predict academic performance based on physical education participation while considering other factors that might influence it. Through measures and visual representations, the aim is to provide insights into the complex connection between physical education and academic success.

Result and Findings

Demographic

Age

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	21	21.0	21.0	21.0
	2	36	36.0	36.0	57.0
	3	17	17.0	17.0	74.0
	4	26	26.0	26.0	100.0
	Total	100	100.0	100.0	

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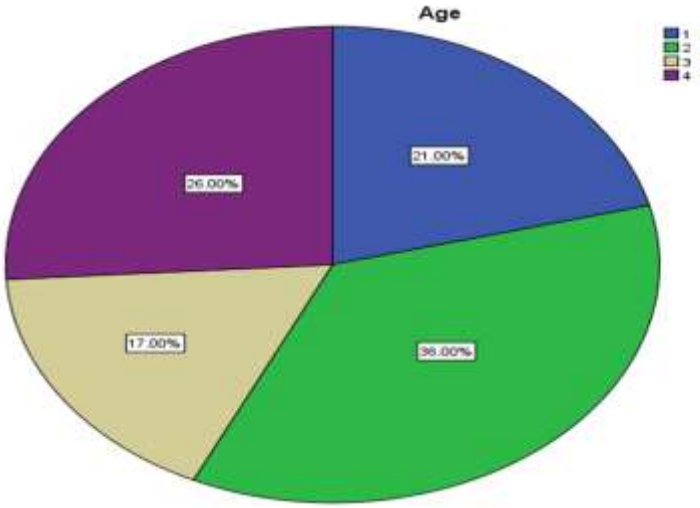

Figure 6: Age group of the participants

(Source: IBM SPSS)

The study included participants, from age groups showcasing a representation. The largest group consisted of individuals aged 37 to 42 years making up 36 percent of the sample. Following behind the age category of 49 to 55 years accounted for 26 percent of the participants. Had a significant impact on the overall distribution. Age categories ranging from 30 to 36 years and 43 to 48 years each represented 21 percent and 17 percent of the sample respectively. The cumulative percentages demonstrate an accumulation of participants, across age categories covering a wide range from 30 to 55 years.

Gender

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	53	53.0	53.0	53.0
	2	36	36.0	36.0	89.0
	3	11	11.0	11.0	100.0
	Total	100	100.0	100.0	

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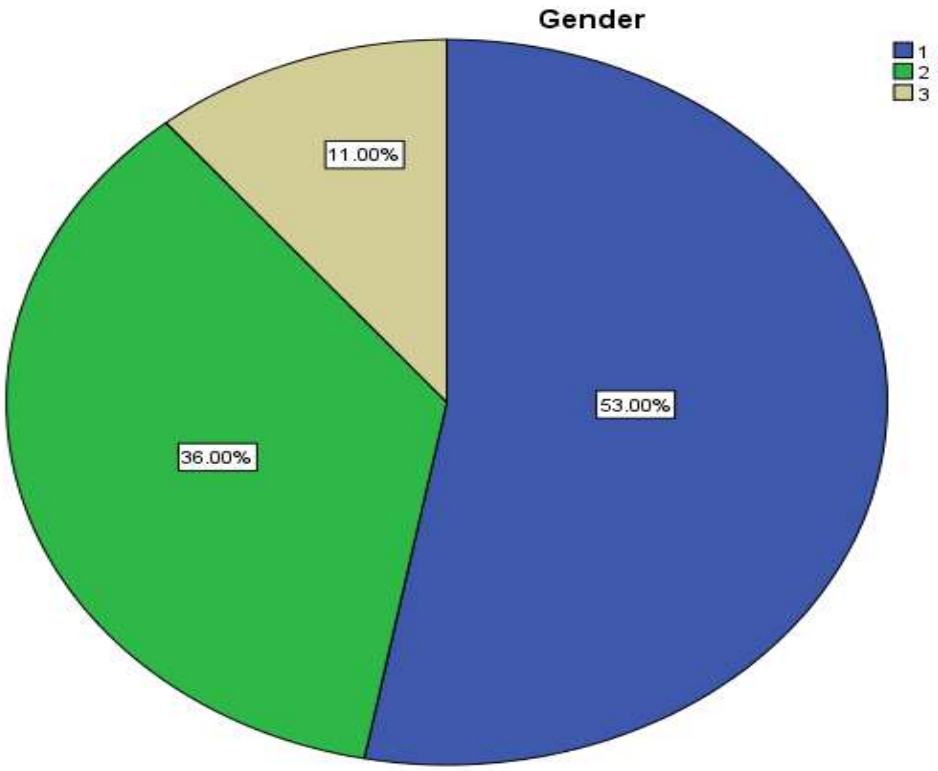

Figure 7: Gender of the participants
(Source: IBM SPSS)

The study's participants represent a range of gender identities. Most of the participants identify as male making up 53 percent of the sample which is a portion. Behind are female participants accounting for 36 percent of the sample indicating a balanced gender representation. Additionally, there is a notable group of participants who identify as 'Others' comprising 11 percent. The gradual accumulation of participants, across gender categories can be observed through the percentages. This distribution allows for an examination of the study's participants considering gender identities and ensuring that the research findings are representative and inclusive.

Educational Qualification

Educational_qualification

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	1	11	11.0	11.0	11.0
	2	21	21.0	21.0	32.0
	3	32	32.0	32.0	64.0
	4	36	36.0	36.0	100.0
	Total	100	100.0	100.0	

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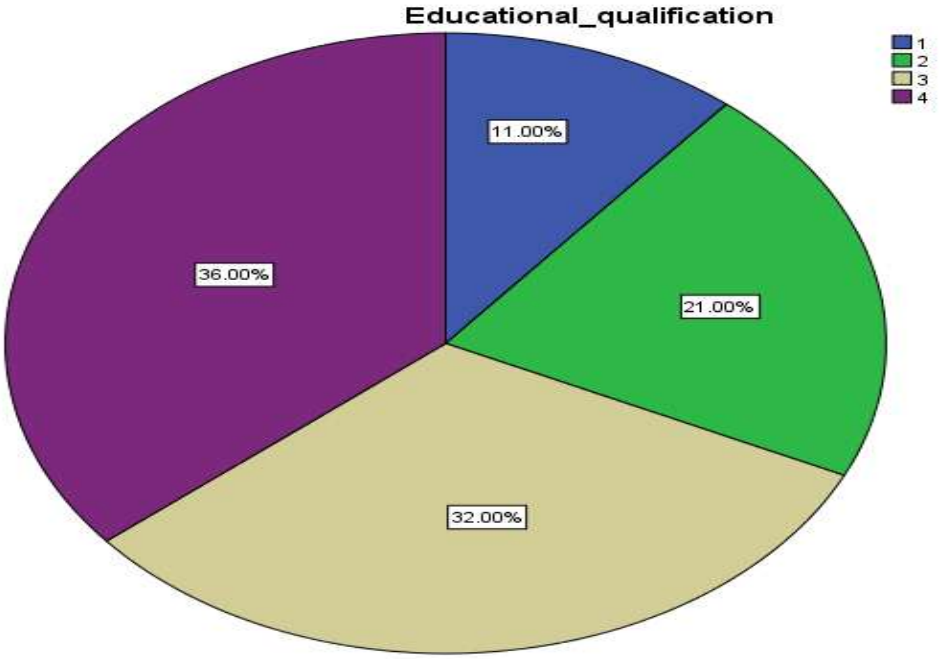

Figure 8: Educational qualification of the participants

(Source: IBM SPSS)

The educational qualifications of the participants in the study, are quite diverse showcasing a range of accomplishments. Around 11 percent of the participants have completed their education while 21 percent have completed Secondary education. The majority of the participants hold a Graduate degree accounting for 32 percent of the total and an additional 36 percent have reached the post-graduate level. The data shows an increase in qualifications from Secondary to Post Graduate levels. This diverse representation allows us to thoroughly explore how physical education influences achievement, across educational backgrounds bringing in various perspectives and experiences that enhance the study's findings.

Linear Regression Analysis

Model Summary[b]

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.848[a]	.719	.716	1.35104	.254

a. Predictors: (Constant), IV_Participation_in_Physical_Education_Classes

b. Dependent Variable: DV_Academic_Achievement

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ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	457.359	1	457.359	250.564	.000[b]
	Residual	178.881	98	1.825		
	Total	636.240	99			

a. Dependent Variable: DV_Academic_Achievement
b. Predictors: (Constant), IV_Participation_in_Physical_Education_Classes

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.308	.317		-.969	.3
	IV_Participation_in_Physical_Education_Classes	.409	.026	.848	15.829	.0

a. Dependent Variable: DV_Academic_Achievement

Table 1: Linear Regression analysis

(Source: IBM SPSS)

The results of the regression analysis conducted to examine the link between achievement (DV_Academic_Achievement) and participation in education classes (IV_Participation_in_Physical_Education_Classes) are quite compelling. The summary of the model shows a relationship with an R-value of 0.719. This means that 71.9 percent of the variation in achievement can be accounted for by participation in physical education classes. The standardised coefficient (Beta) for participation in education is 0.848, which indicates a positive impact (da Costa et al. 2020). The ANOVA results further confirm the effectiveness of the model as shown by a F statistic of 250.564 ($p < 0.001$). This suggests that the regression model is statistically significant in predicting achievement.

When it comes to coefficients the unstandardized coefficient (B) for participation in education is 0.409 indicating that each unit increase in participation corresponds to a 0.409 unit increase in achievement. The t-statistic value of 15.829 reinforces the strength of this relationship with a p-value (p less than 0.001). To summarise, the regression analysis highlights a positive connection between participating in education classes and academic achievement providing empirical evidence to support the hypothesis that increased engagement in physical education has a positive influence on academic outcomes. These findings have implications for policies and practices emphasising how physical education contributes holistically to student success.

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Correlation

Correlations

		IV_Participation_in_Physical_Education_Classes	DV_Academic_Achievement
IV_Participation_in_Physical_Education_Classes	Pearson Correlation	1	.848**
	Sig. (2-tailed)		.000
	N	100	100
DV_Academic_Achievement	Pearson Correlation	.848**	1
	Sig. (2-tailed)	.000	
	N	100	100

**. Correlation is significant at the 0.01 level (2-tailed).

Table 3: Pearson Correlation Test
(Source: IBM SPSS)

The analysis of the relationship between participating in education classes (IV_Participation_in_Physical_Education_Classes)and academic achievement (DV_Academic_Achievement) shows a positive correlation. The Pearson correlation coefficient, which measures this association is 0.848 indicating a connection between the two variables. The p-value of 0.000 ($p < 0.01$) further confirms the significance of this correlation. With a sample size of 100 participants, these robust findings emphasise the connection between engaging in education and achieving higher academic outcomes. These results provide evidence that supports the impact of physical education on academic success highlighting its importance, within comprehensive educational approaches.

Discussion

The results, from analysing the correlation and regression provide us with insights into how participation in education classes relates to academic achievement. This study found a strong positive correlation coefficient of 0.848 indicating that as students engage more in education their academic performance tends to improve. This correlation holds both significance and real-world significance as this study had a sample size of 100 participants. The regression analysis further supports this relationship by showing that 71.9 percent of the variation in achievement can be explained by participation in physical education classes. The positive unstandardized coefficient ($B = 0.409$) suggests that for each unit of participation, there is an increase of 0.409 units in academic achievement. The F statistic (250.564, $p < 0.001$) also demonstrates the significance of the ANOVA results affirming the importance of the regression model in predicting academic achievement.

These findings have implications for policies and practices highlighting the holistic benefits of incorporating physical education into student success strategies. The observed positive relationship aligns with the belief that regular physical activity not only contributes to health but also enhances cognitive development and potentially improves academic performance (Barbosa et al. 2021). Therefore, emphasizing education within schools and educational institutions can serve as an approach to promoting comprehensive student well-being.

The conversation also acknowledges that the connection between education and academic achievement could go both ways. Although the findings imply that more involvement in education is linked to academic performance it's also possible that individuals who excel academically are more likely to participate in physical activities. To understand this relationship better, future studies could investigate how it evolves over time.

Conclusion

In summary, this study presents evidence that shows a positive connection between participating in physical education classes and achieving academic success. The diverse range of participants, including age groups, genders and educational backgrounds adds credibility to the findings. The correlation and regression results highlight the relationship between engaging in physical education and attaining higher academic achievements. These findings have implications for policies emphasising the need to incorporate physical education into school curricula to promote the holistic development of students. While this study establishes a correlation, future research could investigate the mechanisms involved and explore potential factors that mediate this relationship. Overall, this investigation contributes to the growing body of knowledge supporting the role of education, in fostering overall well-being and academic accomplishments.

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Appendices

Appendix 1: Survey Questionnaire

Link
[https://docs.google.com/forms/d/e/1FAIpQLSfsG1JtKu6Nxc9yQ09VhKRc6wBfyOGaaa0-p5elxqfa3mnywQ/viewform?usp=sf_link]

What is your age?
30-36
37-42
43-48
49-55

What is your gender?
Male
Female
Others

What is your educational qualification?
Secondary
Higher Secondary
Graduate
Post Graduate

Independent Variable: Regular Participation in Physical Education Classes

Do you believe that engaging in physical education activities contributes to improved cognitive abilities?
Strongly agree
Agree
Neutral
Disagree
Strongly Disagree

Do you think there is a connection between your behavior in other classes and your participation in physical education?
Strongly agree
Agree
Neutral
Disagree
Strongly Disagree

Do you think the duration and intensity of physical education classes impact your ability to focus on academic tasks?
Yes
No

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Do you think there is a connection between your behavior in other classes and your participation in physical education?
Yes
No
Do you believe that skills learned in physical education, such as discipline, transfer to your academic responsibilities?
Strongly agree
Agree
Neutral
Disagree
Strongly Disagree
Do you believe your physical education teachers are in promoting an engaging and structured learning environment?
Strongly agree
Agree
Neutral
Disagree
Strongly Disagree

Dependent Variable: Academic Achievement

Do you believe that your physical fitness level contributes to your academic performance?
Strongly agree
Agree
Neutral
Disagree
Strongly Disagree
In your opinion, are there gender-based differences in how physical education influences academic achievement among your peers?
Strongly agree
Agree
Neutral
Disagree
Strongly Disagree