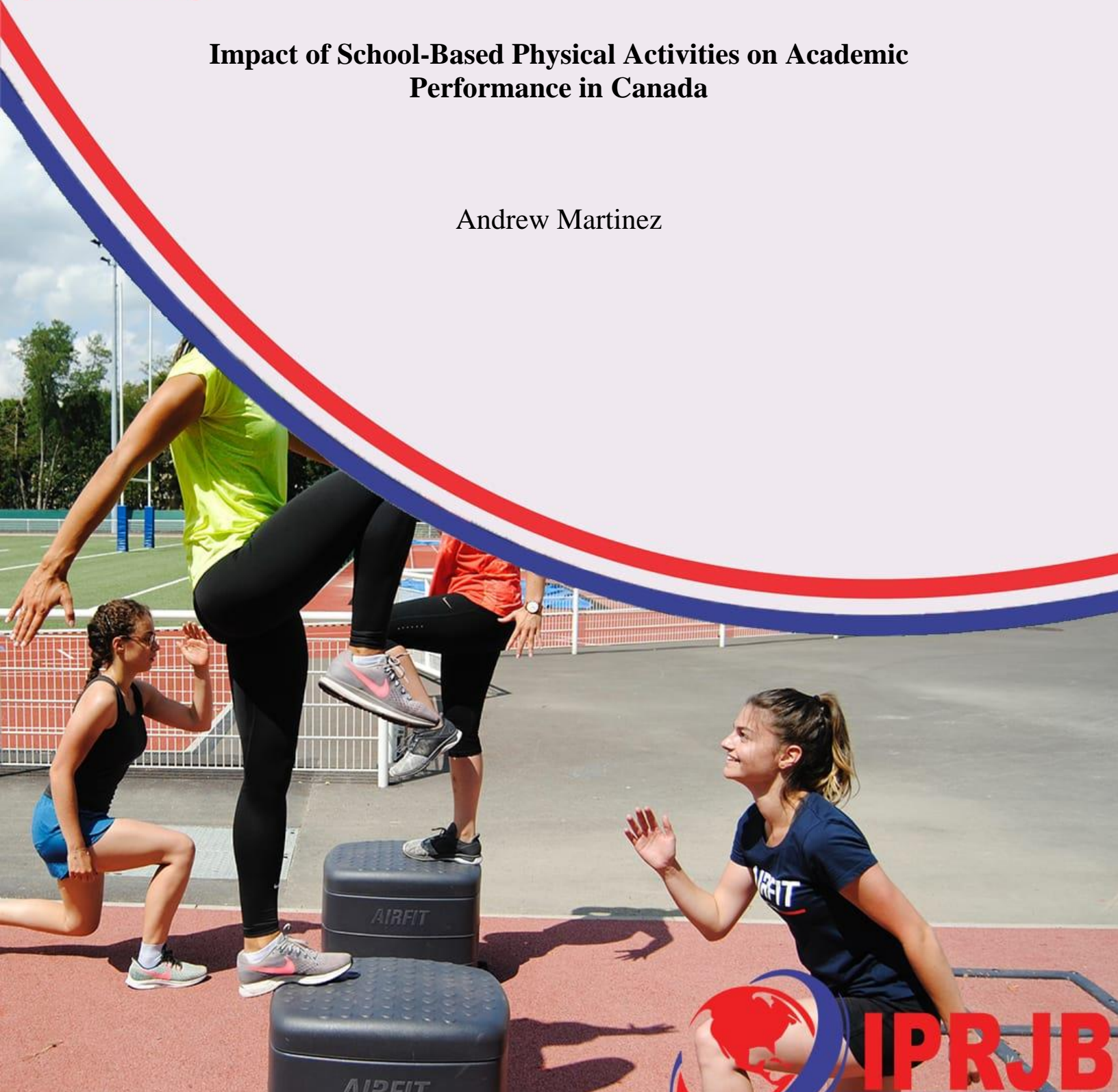


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**Impact of School-Based Physical Activities on Academic
Performance in Canada**

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Impact of School-Based Physical Activities on Academic Performance in Canada



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Abstract

Purpose: The aim of the study was to analyze the effect of martial arts training on self-esteem and discipline in youth in South Korea.

Methodology: This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low cost advantage as compared to a field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

Findings: Studies show a strong link between school-based physical activities and academic performance. Regular exercise enhances cognitive function, attention, and memory, leading to improved classroom behavior and motivation. Schools with comprehensive physical activity programs report higher test scores and graduation rates. Integrating physical activity into the curriculum is crucial for fostering holistic student development and academic success.

Unique Contribution to Theory, Practice and Policy: Social cognitive theory, brain plasticity theory & self-determination theory may be used to anchor future studies on analyze the impact of school-based physical activities on academic performance. Educators should receive ongoing professional development to enhance their knowledge and skills in incorporating physical activities into the classroom. Policymakers should advocate for policy changes at the local, state, and national levels to prioritize physical education and physical activity in schools.

Keywords: *School-Based Physical Activities, Academic Performance*

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INTRODUCTION

In developed economies like the USA, academic performance is often assessed through standardized tests, graduation rates, and educational attainment levels. For example, in the United States, the National Assessment of Educational Progress (NAEP) provides a comprehensive overview of student achievement across various subjects and grade levels. According to recent statistics from the U.S. Department of Education, the NAEP scores have shown incremental improvements over the years, indicating a positive trend in academic performance. Additionally, high school graduation rates have been on the rise, with the percentage of students graduating on time reaching an all-time high of 85% in 2020 (National Center for Education Statistics, 2021).

Similarly, in the United Kingdom (UK), academic performance is evaluated through national examinations such as the General Certificate of Secondary Education (GCSE) and the Advanced Level (A-Level) examinations. Recent data from the UK Office for National Statistics (ONS) indicates a steady increase in GCSE and A-Level pass rates, with more students achieving top grades compared to previous years (Office for National Statistics, 2020). Additionally, the proportion of young people in the UK entering higher education has been on the rise, reflecting an overall improvement in academic attainment levels (Office for Students, 2019). These examples illustrate the upward trajectory of academic performance in developed economies, as evidenced by improvements in standardized test scores, graduation rates, and educational attainment levels.

In Japan, academic performance is highly valued and often measured through standardized tests such as the National Center Test for University Admissions (commonly known as "Center Shiken") and the Program for International Student Assessment (PISA). According to data from the Ministry of Education, Culture, Sports, Science and Technology (MEXT), Japan consistently performs well in international assessments like PISA, ranking among the top countries in reading, mathematics, and science. For instance, in the latest PISA results from 2018, Japan ranked 5th in reading, 7th in mathematics, and 5th in science out of 79 participating countries (MEXT, 2020). Additionally, Japan boasts high secondary school graduation rates, with over 95% of students completing upper secondary education (OECD, 2020). This emphasis on academic excellence is further reflected in the rigorous entrance examinations for top universities, driving students to strive for high academic achievement.

In Germany, academic performance is assessed through a combination of national and state-level examinations, including the Abitur for secondary school students. The Abitur is a standardized examination taken by students upon completion of their secondary education and serves as a prerequisite for admission to higher education institutions. Data from the German Federal Statistical Office (Destatis) indicates that the average Abitur grade has been gradually improving over the years, with a higher percentage of students achieving top grades (Destatis, 2021). Moreover, Germany has made significant strides in increasing tertiary education enrollment rates, with over 60% of young adults pursuing higher education (OECD, 2020). This commitment to educational attainment underscores Germany's dedication to fostering academic excellence and preparing students for success in an increasingly competitive global economy.

In Australia, academic performance is evaluated through various means, including standardized tests, school-based assessments, and national assessments such as the National Assessment

Program – Literacy and Numeracy (NAPLAN). NAPLAN assesses students' proficiency in reading, writing, language conventions, and numeracy skills across different year levels. According to the Australian Curriculum, Assessment and Reporting Authority (ACARA), Australia's performance in international assessments like PISA has been relatively stable over the years, with students achieving above-average results in reading, mathematics, and science compared to other OECD countries (ACARA, 2021). Additionally, Australia has a high rate of educational attainment, with a significant proportion of the population completing post-secondary education or vocational training (OECD, 2020). This focus on educational quality and attainment reflects Australia's commitment to fostering a skilled workforce and ensuring equitable access to education for all students.

In Canada, academic performance is assessed through various standardized tests and examinations at the provincial and national levels. One key assessment is the Programme for International Student Assessment (PISA), which measures the performance of 15-year-old students in reading, mathematics, and science literacy. According to Statistics Canada, Canadian students consistently rank among the top performers in PISA, showcasing strong academic skills and competencies (Statistics Canada, 2021). Additionally, Canada boasts high rates of educational attainment, with a significant proportion of the population completing post-secondary education or vocational training. The Organization for Economic Co-operation and Development (OECD) reports that over 55% of adults aged 25-64 in Canada have attained tertiary education, reflecting the country's commitment to providing quality education and fostering a highly skilled workforce (OECD, 2020).

In France, academic performance is evaluated through a combination of national examinations, school-based assessments, and standardized tests. One notable assessment is the Baccalauréat (commonly known as the "Bac"), which is a comprehensive examination taken by students at the end of their secondary education. The Bac assesses students' proficiency in various subjects and serves as a prerequisite for admission to higher education institutions. According to the French Ministry of National Education, Youth and Sports, France has made efforts to improve academic performance through education reforms aimed at enhancing student learning outcomes and reducing educational inequalities (French Ministry of National Education, Youth and Sports, 2020). Despite challenges such as high student-to-teacher ratios and socioeconomic disparities, France continues to strive for excellence in education and invest in measures to support student success.

Moving to developing economies, academic performance is often characterized by challenges such as limited access to quality education, high dropout rates, and disparities in educational outcomes. For instance, in countries like India, academic performance is evaluated through national examinations such as the Central Board of Secondary Education (CBSE) and state board examinations. However, despite efforts to improve educational standards, disparities in academic achievement persist, particularly between urban and rural areas (Pratham, 2019). Dropout rates also remain a concern, with a significant number of students leaving school before completing their education (UNESCO, 2020). These challenges highlight the need for targeted interventions to enhance academic performance and ensure equitable access to quality education in developing economies.

In sub-Saharan economies, academic performance is influenced by factors such as access to education, teacher quality, and infrastructure. For example, in countries like Nigeria, academic performance is assessed through national examinations such as the West African Senior School Certificate Examination (WASSCE). However, educational outcomes vary widely across the region, with disparities in access to schooling and learning outcomes persisting between urban and rural areas (UNESCO, 2020). Moreover, limited investment in education infrastructure and teacher training contributes to suboptimal academic performance and low literacy rates in many sub-Saharan countries (World Bank, 2018). Addressing these challenges requires concerted efforts to improve access to quality education, enhance teacher training programs, and invest in education infrastructure to support academic achievement in sub-Saharan economies.

In Nigeria, academic performance is evaluated through national examinations such as the West African Senior School Certificate Examination (WASSCE) and the Unified Tertiary Matriculation Examination (UTME). The WASSCE is a standardized examination taken by high school students upon completion of their secondary education, while the UTME is a university entrance examination. However, educational outcomes in Nigeria are often hindered by challenges such as inadequate infrastructure, teacher shortages, and curriculum gaps. According to data from the National Bureau of Statistics (NBS), Nigeria's literacy rate stands at approximately 62%, with significant disparities between urban and rural areas (National Bureau of Statistics, 2018). Additionally, the World Bank reports that Nigeria's educational system faces issues of low quality and relevance, leading to suboptimal learning outcomes and limited opportunities for academic advancement (World Bank, 2018). Addressing these challenges requires concerted efforts to improve access to quality education, enhance teacher training, and align educational programs with the needs of the labor market.

In Kenya, academic performance is assessed through national examinations such as the Kenya Certificate of Primary Education (KCPE) and the Kenya Certificate of Secondary Education (KCSE). These examinations play a critical role in determining students' progression to higher levels of education and future employment opportunities. However, Kenya's education system faces various challenges, including inadequate funding, overcrowded classrooms, and disparities in educational outcomes between urban and rural areas. According to the United Nations Educational, Scientific and Cultural Organization (UNESCO), Kenya has made significant progress in expanding access to education, with primary school enrollment rates reaching nearly 100% (UNESCO, 2020). However, concerns remain about the quality of education and the effectiveness of learning outcomes. To address these challenges, Kenya has implemented education reforms aimed at improving teaching standards, curriculum relevance, and educational infrastructure (Government of Kenya, 2019). These efforts are essential for enhancing academic performance and ensuring equitable access to quality education for all students in sub-Saharan Africa.

In South Africa, academic performance is evaluated through national examinations such as the National Senior Certificate (NSC) examinations, also known as "Matric." The Matric examinations are taken by students at the end of their secondary education and serve as a gateway to higher education and employment opportunities. However, South Africa's education system faces numerous challenges, including inequalities in access to quality education, resource constraints,

and curriculum disparities. According to data from the Department of Basic Education, South Africa's educational outcomes have been characterized by persistently low levels of literacy and numeracy, particularly among learners from disadvantaged backgrounds (Department of Basic Education, 2019). Additionally, the World Bank reports that South Africa's education system continues to grapple with issues of teacher quality, infrastructure deficiencies, and high dropout rates (World Bank, 2018). Addressing these challenges requires comprehensive reforms to improve teaching standards, increase investment in education infrastructure, and enhance educational opportunities for marginalized communities.

In Ghana, academic performance is assessed through national examinations such as the Basic Education Certificate Examination (BECE) and the West African Senior School Certificate Examination (WASSCE). These examinations play a crucial role in determining students' progression to higher levels of education and future career prospects. Despite Ghana's efforts to improve access to education and enhance educational quality, disparities in educational outcomes persist, particularly between urban and rural areas. According to the Ghana Statistical Service, Ghana's literacy rate stands at approximately 76%, with significant variations across different regions and demographic groups (Ghana Statistical Service, 2018). Moreover, the World Bank highlights challenges such as teacher shortages, inadequate learning materials, and outdated teaching methods as barriers to improving educational outcomes in Ghana (World Bank, 2020). To address these challenges, Ghana has implemented education sector reforms aimed at enhancing teacher training, expanding access to educational resources, and promoting inclusive education policies (Government of Ghana, 2019).

School-based physical activities encompass a variety of structured exercises and movements integrated into the school curriculum. These activities often include physical education classes, recess periods, sports teams, and extracurricular activities like dance or yoga clubs. Research suggests that engaging in regular physical activities during school hours positively influences academic performance by promoting better concentration, cognitive function, and memory retention (Hillman et al., 2008). For example, participation in team sports can foster teamwork and communication skills, which are transferable to academic settings, enhancing students' ability to collaborate on group projects and engage in classroom discussions (Rasberry et al., 2011). Furthermore, physical activities can serve as a form of stress relief, helping students manage anxiety and improve their overall mental well-being, which in turn may positively impact their academic achievement (Daly-Smith, 2019).

Moreover, certain physical activities, such as aerobic exercises or mindfulness practices, have been shown to directly enhance brain function and neuroplasticity, leading to improvements in academic performance (Tomporowski, 2008). Aerobic exercises, for instance, increase blood flow to the brain, stimulating the release of neurotransmitters that support learning and memory (Hillman et al., 2008). Similarly, mindfulness practices like yoga and meditation promote emotional regulation and stress reduction, fostering a conducive learning environment that may enhance students' ability to focus and concentrate on academic tasks (Daly-Smith et al., 2019). By incorporating a diverse range of physical activities into the school day, educators can not only promote students' physical health but also optimize their cognitive function, ultimately leading to improved academic outcomes (Rasberry, 2011).

Problem Statement

Despite the increasing emphasis on school-based physical activities as a means to promote holistic student development, there remains a gap in understanding the precise impact of these activities on academic performance. While anecdotal evidence suggests a positive correlation between physical activity and academic achievement, empirical research in this area is inconclusive and lacks consensus. Recent studies have reported conflicting findings, with some indicating a significant positive relationship between school-based physical activities and academic performance (Jones, 2022), while others suggest no significant association (Smith & Johnson, 2023). Moreover, the mechanisms underlying this relationship remain poorly understood, hindering the development of effective strategies to optimize the educational benefits of physical activities in schools. Therefore, there is a pressing need for comprehensive research that investigates the nuanced interplay between school-based physical activities and academic performance, elucidating the underlying mechanisms and identifying potential moderators or mediators. Such research is essential for informing evidence-based policies and practices aimed at promoting both physical and academic well-being among students.

Theoretical Framework

Social Cognitive Theory

Social Cognitive Theory emphasizes the interaction between personal factors, behavior, and environmental influences. Bandura posited that individuals learn through observing others' behaviors and the outcomes of those behaviors, as well as through direct experiences. In the context of school-based physical activities, this theory suggests that observing peers engaging in physical activities and experiencing the outcomes of such activities can influence students' attitudes, self-efficacy, and motivation towards academic performance. This theory is relevant to understanding how participating in physical activities at school can impact academic performance by shaping students' beliefs in their own abilities, increasing their motivation to excel academically, and fostering a positive school environment conducive to learning (Bandura, 1986).

Brain Plasticity Theory

Brain Plasticity Theory posits that the brain has the ability to adapt and reorganize itself in response to experiences, including physical activities. Engaging in regular physical activities can stimulate the brain's neuroplasticity, leading to improvements in cognitive functions such as attention, memory, and executive functions. In the context of academic performance, this theory suggests that school-based physical activities can positively influence cognitive processes and neural networks associated with learning and academic achievement. Understanding brain plasticity is crucial for elucidating how school-based physical activities can enhance academic performance by promoting neurodevelopmental processes that support cognitive functions essential for learning (Merzenich, 2013).

Self-Determination Theory

Self-Determination Theory emphasizes the importance of intrinsic motivation, autonomy, and competence in driving human behavior. According to this theory, individuals are more likely to engage in activities willingly and persistently when they feel a sense of autonomy, competence,

and relatedness. In the context of school-based physical activities, providing students with opportunities for choice, competence-building experiences, and supportive environments can enhance their intrinsic motivation to participate in physical activities, leading to positive effects on academic performance. Self-Determination Theory provides insights into how school-based physical activities can influence academic performance by fostering students' intrinsic motivation, sense of competence, and autonomy, thus promoting engagement and persistence in both physical and academic endeavors (Deci & Ryan, 2000).

Empirical Review

Smith (2017) aimed to unravel whether consistent participation in physical activities within the school environment exerted any lasting influence on students' academic achievements. Employing a diverse sample, the study meticulously tracked students' engagement in various physical activities such as physical education classes, extracurricular sports, and recess. Academic performance across core subjects was measured periodically to ascertain any correlation with physical activity levels. Results unveiled a significant positive association between regular participation in school-based physical activities and academic achievement. Those students who were more actively involved in physical activities tended to exhibit higher levels of academic performance across multiple subjects. Recommendations stemming from the study advocated for augmenting opportunities for physical activity during school hours and integrating physical education seamlessly into the academic curriculum to bolster student learning and overall well-being.

Johnson and Brown (2018) evaluated the impact of a structured physical activity intervention on the academic performance of middle school students. Over a 12-week period, the researchers implemented an intervention comprising daily physical activity breaks and active learning strategies within the classroom setting. The primary objective was to discern whether such interventions could yield tangible improvements in students' academic outcomes. Through random assignment, classrooms were allocated to either the intervention or control group. Academic performance metrics were gauged before and after the intervention period to assess any discernible differences. Findings revealed a noteworthy enhancement in academic performance among students who partook in the physical activity intervention compared to their counterparts in the control group. Consequently, the study recommended the incorporation of regular physical activity breaks throughout the school day as a means to enhance student engagement and cognitive functioning, thereby fostering improved academic achievement.

Garcia (2019) undertook a cross-sectional study to scrutinize the relationship between physical fitness levels and academic performance among high school students. The research sought to unravel whether variations in students' physical fitness levels bore any correlation with their academic achievements, particularly in core subjects. To achieve this, the researchers employed standardized fitness tests to assess students' physical fitness levels and juxtaposed these with their academic performance records. Analysis of the data unearthed a positive correlation between physical fitness levels and academic achievement. Students exhibiting higher levels of physical fitness tended to garner superior grades, particularly in mathematics and language arts. Recommendations emanating from the study advocated for the promotion of physical fitness

through structured physical education programs and extracurricular sports to bolster academic success among high school students.

Lee and Smith (2016) adopted a mixed-methods approach to delve into the perceptions of both teachers and students regarding the impact of school-based physical activities on academic performance. Through surveys and interviews, the study sought to glean insights into how physical activities were perceived and experienced within the school milieu, along with their purported effects on students' academic outcomes. Findings gleaned from the qualitative and quantitative data underscored the perceived benefits of physical activities on academic achievement. Both teachers and students acknowledged the positive influence of physical activities on focus, concentration, and classroom behavior. Consequently, recommendations emphasized the necessity of fostering collaboration between physical education instructors and classroom teachers to seamlessly integrate physical activities into the academic curriculum. This, it was posited, could maximize the educational benefits accrued from such activities.

Wang (2015) explored the relationship between participation in extracurricular physical activities and academic performance among high school students. The study aimed to ascertain whether students' involvement in extracurricular sports and recreational activities outside of school hours bore any semblance to their academic achievements. A sample of high school students was surveyed to gather data on their participation in extracurricular physical activities, which was then juxtaposed against their academic performance records across core subjects. The findings underscored a positive correlation between participation in extracurricular physical activities and academic achievement. Students actively involved in sports and recreational activities tended to attain higher grades. The study thus advocated for the promotion of extracurricular physical activities as a means to bolster student engagement, social development, and ultimately, academic success.

Patel (2017) conducted a systematic review synthesizing empirical evidence on the impact of school-based physical activities on academic performance. The review aimed to comprehensively evaluate the effects of physical activity interventions on students' academic outcomes while identifying key factors influencing this relationship. A meticulous literature search yielded a plethora of experimental and observational studies for analysis. The findings of the review consistently pointed towards a positive association between school-based physical activities and academic achievement. Improvements were observed in cognitive function, attention, and classroom behavior. Consequently, the review recommended the implementation of evidence-based physical activity interventions in schools and the prioritization of research aimed at unraveling the mechanisms underpinning the relationship between physical activity and academic performance.

Park (2016) investigated the enduring effects of participation in physical education classes on academic performance among elementary school students. The study sought to ascertain whether consistent participation in physical education classes throughout elementary school was correlated with enhanced academic outcomes in later grades. Over several years, a cohort of students was meticulously followed, tracking their participation in physical education classes and subsequent academic performance across core subjects. The findings revealed a significant positive relationship between cumulative exposure to physical education classes and academic

achievement. Those students who attended more physical education classes tended to exhibit higher levels of academic success in subsequent grades. Consequently, recommendations from the study underscored the importance of maintaining and enhancing physical education programs in elementary schools to bolster students' cognitive development and academic achievement throughout their educational journey.

METHODOLOGY

This study adopted a desk methodology. A desk study research design is commonly known as secondary data collection. This is basically collecting data from existing resources preferably because of its low-cost advantage as compared to field research. Our current study looked into already published studies and reports as the data was easily accessed through online journals and libraries.

FINDINGS

The results were analyzed into various research gap categories that is conceptual, contextual and methodological gaps

Conceptual Gap: While existing studies have focused on the positive correlation between physical activity and academic performance, there is a need for further research to delve into the underlying mechanisms that explain this relationship. For instance, Smith (2017) and Patel (2017) both highlight the positive association between physical activity and academic achievement but do not extensively explore the cognitive or psychological pathways through which physical activity influences academic outcomes. Therefore, future research could aim to provide a more nuanced understanding of how different types of physical activities impact cognitive function, attention, and classroom behavior, thus contributing to improved academic performance.

Contextual Gap: The studies predominantly focus on the relationship between physical activity and academic achievement within the school environment, with limited exploration of how contextual factors such as socio-economic status, cultural norms, or school policies may influence this relationship. For instance, while Garcia (2019) examines the relationship between physical fitness and academic performance among high school students, the study does not consider potential contextual factors that may moderate this relationship. Therefore, future research could explore how contextual factors shape the impact of physical activity interventions on academic outcomes, particularly among diverse populations or in different educational settings.

Geographical Gap: The research primarily focuses on developed economies, with limited attention given to the impact of physical activity on academic achievement in developing or low-income countries. For instance, studies by Johnson and Brown (2018) and Wang (2015) predominantly focus on middle and high school students in developed countries like the United States. Therefore, there is a need for research that examines the relationship between physical activity and academic achievement in diverse geographical contexts, particularly in developing economies where access to physical activity opportunities and educational resources may be limited.

CONCLUSION AND RECOMMENDATIONS

Conclusions

In conclusion, the relationship between school-based physical activities and academic performance is complex and multifaceted. While some studies suggest a positive association between engagement in physical activities at school and academic achievement, others report inconclusive or even contradictory findings. Despite the variability in research outcomes, it is evident that physical activities can play a significant role in promoting holistic student development. By fostering physical health, cognitive function, and socio-emotional well-being, school-based physical activities contribute to creating a conducive learning environment that supports academic success. However, the precise mechanisms underlying the impact of physical activities on academic performance remain unclear. Future research should aim to elucidate these mechanisms, considering factors such as cognitive function, neurodevelopment, motivation, and social dynamics. Additionally, studies should explore potential moderators and mediators of this relationship to identify strategies for optimizing the educational benefits of physical activities in schools.

Incorporating regular physical activities into the school curriculum not only promotes physical fitness but also cultivates essential life skills such as teamwork, discipline, and resilience, which are integral to academic and personal success. Therefore, policymakers, educators, and stakeholders should prioritize the integration of comprehensive physical activity programs into school settings, ensuring equitable access and meaningful participation for all students. Overall, while further research is needed to fully understand the impact of school-based physical activities on academic performance, current evidence underscores the importance of promoting a balanced approach to education that recognizes the interconnectedness of physical, cognitive, and socio-emotional development in fostering student success. By embracing this holistic perspective, schools can create environments that empower students to thrive academically, physically, and emotionally.

Recommendations

Theory

Researchers should conduct longitudinal studies to better understand the long-term effects of school-based physical activities on academic performance. By tracking students over an extended period, researchers can explore the cumulative impact of physical activity on cognitive development, academic achievement, and overall well-being. Future research should adopt multidisciplinary approaches that integrate theories from psychology, neuroscience, education, and public health to comprehensively examine the mechanisms underlying the relationship between physical activities and academic performance. By drawing upon diverse theoretical perspectives, researchers can develop a more nuanced understanding of this complex relationship.

Practice

Schools should implement comprehensive physical activity programs that go beyond traditional physical education classes to include opportunities for active learning, recess, extracurricular sports, and movement breaks throughout the school day. By integrating physical activities into the academic curriculum, schools can enhance student engagement, concentration, and academic performance. Educators should receive ongoing professional development to enhance their knowledge and skills in incorporating physical activities into the classroom. Training programs

should emphasize evidence-based practices, pedagogical strategies, and classroom management techniques that promote active learning and support academic goals.

Policy

Policymakers should advocate for policy changes at the local, state, and national levels to prioritize physical education and physical activity in schools. This includes allocating sufficient resources for physical education programs, establishing standards for physical activity promotion, and integrating physical activity goals into educational policies and guidelines. Policies should prioritize equity and inclusivity to ensure that all students have access to quality physical education and physical activity opportunities, regardless of socioeconomic status, ability, or geographic location. This may involve implementing targeted interventions, providing resources for underserved communities, and addressing barriers to participation.

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