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The Relationship between School Sports Participation and Academic Performance: A Comprehensive Review

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ABSTRACT

This paper delves into the intricate relationship between school sports participation and academic performance among children and adolescents. It explores three primary types of physical activity in schools: physical education classes, school sports, and free-time activities. While physical education is typically mandated, school sports represent a voluntary but popular form of physical activity. The paper investigates existing literature on the impact of school sports on academic outcomes, considering both biological and social mechanisms. It examines how sports participation influences cognitive function, brain structure, and academic achievement. Additionally, the paper explores the development of key skills consistent with educational values, the role of social relations, and the psychological benefits associated with sports participation. Moreover, it scrutinizes potential drawbacks such as time allocation and energy devoted to sports at the expense of academic pursuits. The synthesis of findings reveals a nuanced relationship, emphasizing the need for further research to elucidate causal mechanisms and inform educational policies promoting holistic development.

Keywords: Sports Participation, Academic Achievement, Cognitive Benefits, Athletic Identity, Competitive Sports

INTRODUCTION

Student participation in physical activity at school encompasses three main types: (a) physical education classes, (b) school sports, and (c) free-time activities [1]. Physical education is typically the most common form of physical activity in schools, mandated by most school districts. The structure of physical education classes varies widely based on factors like school, teacher, location, and season. Typically, students engage in individual or team-based activities and undergo periodic skill tests to assess fitness levels. However, questions persist regarding the actual amount of physical activity students achieve in these classes.

School sports represent a second type of physical activity that has garnered increased attention from researchers. Sports programs in middle and high schools vary widely based on factors such as school level, grade, district resources, and student preferences, encompassing both team-based (e.g., soccer, basketball) and individual sports (e.g., tennis, cross country). Unlike physical education, participation in school sports is typically not mandated by schools or districts. Despite the potential benefits of school sports on physical activity and academic outcomes, research in this area has been limited compared to physical education or specialized physical activity interventions [2]. Nonetheless, promising evidence suggests that

school sports may enhance student academic outcomes through social contexts, increased engagement with school resources, and alignment with school values [3, 4]. Given the popularity of school sports and their significant contribution to children's physical activity, additional research is needed to further explore the relationship between school sports and academic performance. Nationally representative data indicate that over half of high school students participate in school sports annually [5, 2]. Overall, there is a pressing need for more research to expand upon the established connections between general physical activity and academic achievement within the context of school sports.

Physical Activity and Academic Performance

Physical activity has been shown to have a positive impact on academic performance in children and adolescents [6]. A recent systematic review of 12 reviews of experimental studies found that while half of the studies reported a positive effect of physical activity on academic performance, the other half reported mixed or inconclusive results [6]. One commonly proposed explanation for this positive association is the enhancement of cognitive function and brain structure and function [7]. [8] conducted a systematic review that supported the beneficial effects of physical activity on cognitive function, brain structure, and function in children.

Additionally, [9] systematically reviewed experimental medical imaging studies and found that physical activity can lead to improvements in white matter integrity in the corpus callosum, a brain region crucial for cognitive processing. Physical activity also influences changes in the frontal lobe, responsible for executive processes, cognition, attention, and information processing. These findings suggest that the changes in brain structure and improved cognitive function resulting from physical activity may contribute to enhanced academic performance.

Sports and Academics: Biological Links

Academic achievement has long been a focus of interest for social workers concerned with child development, and research consistently indicates that physical activity, regardless of type, can enhance children's academic outcomes. One crucial mechanism underlying the relationship between physical activity and academics is a direct physiological connection between activity and cognition. Evidence from biological and neurological sciences suggests that physical activity activates cognitive resources and facilitates faster cognitive processing through stimulus encoding [10]. Additionally, physical activity can promote cellular stability and mitigate the negative effects of stress on the body, which is particularly significant for children as their brains and intellect are still developing [11].

[12] conducted a meta-analysis encompassing observational, quasi-experimental, and experimental studies examining exercise interventions and participation in physical education to determine whether physical activity positively impacts children's cognitive abilities. Analyzing 44 unique studies and 125 effect sizes, they found a mean effect size of .32 ($p < .05$) for physical activity on cognitive development. However, it's important to note that the review did not include any studies specifically focusing on school sports.

The correlation between physical activity and academic achievement is directly tied to enhanced cognition, which is reflected in core academic abilities and outcomes such as grades and test scores. Recent observational studies have provided robust evidence supporting the link between physical activity and academic performance. For instance, a multiple regression analysis involving 4,746 middle and high school students revealed that increasing physical activity levels from less than 2.5 hours per week of moderate-to-vigorous exercise to 7.0 hours per week was associated with 5.7%–9.1% improvements in students' grades [13]. Moreover, [14] conducted a systematic review of 127 positive associations between school-based physical activity, including school sports, and academic achievement across 50 unique studies published until 2008. The

majority of the reviewed studies reported statistically significant improvements in academic performance among children who engaged in additional or enhanced physical activity, such as extended sessions, compared to those who engaged in no physical activity or typical physical activity routines [14]. Additionally, other observational analyses consistently demonstrate that increased physical activity is directly linked to improvements in academic achievement outcomes [15].

Sport and Academic Performance

Sport is a unique form of physical activity distinct from recreation (e.g., going to the gym or dancing), active transport (e.g., walking or biking to school or work), and other physical activities (e.g., physically active employment or household chores). It involves physical exertion, skill, and/or hand-eye coordination as the primary focus, with elements of competition and rules set formally through organizations. Sports can be individual or team-based and are commonly organized during both school and leisure time, on weekdays or weekends. Apart from the benefits derived from general physical activity, participation in sports offers additional advantages.

Recent experimental studies have revealed that compared to moderate to vigorous physical activities with low cognitive engagement, participation in sports offers additional cognitive benefits. These benefits are likely attributed to the heightened cognitive load associated with engaging in moderate to vigorous physical activity and skills within the dynamic and ever-changing environment of sports. Furthermore, the type of sport and skills involved may influence the cognitive advantages observed. Sports can be categorized into open skills (performed in dynamic and changing environments like tennis or basketball) or closed skills (performed in predictable and stable environments like swimming or cycling). Open skills, which entail high cognitive demands, provide practice in cognitive functions such as visuospatial ability, information-processing speed, multitasking flexibility, working memory, and inhibitory control. Two systematic reviews have indicated that sports involving open skills are more effective in enhancing cognitive function compared to those with closed skills [16]. Therefore, participation in sports may yield additional cognitive benefits, including improved academic performance, compared to more generalized physical activity [17]. However, the evidence specifically examining the association between sport participation and academic performance has not yet undergone systematic review or meta-analysis.

Literature Review

Research on the correlation between extracurricular participation and subsequent academic achievement

has concentrated on identifying plausible explanations within specific contexts, particularly among physically active student populations [18, 19]. Theoretical frameworks have been presented to elucidate different perspectives of this relationship [18]. Previous studies have explored participant characteristics (e.g., gender, race, background, and academic credentials for college entrance) relevant to understanding the academic performance of students involved in sports activities. Additionally, external factors influencing the relationship between sports participation and academic performance have been examined, such as the support system's negative impact on physically active students' academic performance at university [20]. Research has considered various types of universities (e.g., private versus public) and a wide range of sports, including basketball, volleyball, football, baseball, hockey, track and field events, and swimming [21]. Some studies have distinguished between revenue and non-revenue sports activities [22].

Despite the expanding literature, findings remain inconclusive. While some researchers assert that student engagement in extracurricular activities, such as sports, enhances academic performance, others argue that sports participation negatively affects academic achievement or yields null results. Discrepancies in research findings can be attributed to variations in data gathering methods and methodologies. Studies utilizing large national samples differ from those using smaller samples from specific states or universities, affecting comparability and external validity. Moreover, differences in qualitative and quantitative approaches, as well as the extent to which a causal argument is pursued, contribute to the inconsistency. Most studies have predominantly focused on assessing participation levels and examining correlations with other variables, such as academic performance, without explicitly exploring causation.

Some researchers have erroneously interpreted correlations between sports participation and academic performance as indicative of a causal relationship, implying that participation either enhances or diminishes academic achievement. However, studies merely comparing participants and non-participants fail to establish causal relationships. A significant methodological issue in research on sports participation involves self-selection bias, where students autonomously choose to participate or not. This self-selection introduces the risk that pre-existing differences between groups of students, rather than the influence of participation itself, may explain observed disparities in academic performance between participants and non-participants.

Development of Key Skills consistent with Educational Values

In the realm of athletics, success is often attributed to traits like self-discipline, concentration, perseverance, determination, and hard work. These qualities, when translated into the academic domain, can serve as indicators of achieving good grades. Physically active students who are motivated not only in sports but also in academics demonstrate self-confidence, maturity, locus of control, and a strong work ethic. They develop skills consistent with educational values, which contribute to successful academic outcomes [23, 3].

Moreover, participating in extracurricular activities such as sports empowers students to take personal initiative. By engaging in activities they genuinely enjoy on a voluntary basis, students are motivated to put in effort to overcome challenges they've chosen for themselves. This intrinsic motivation fosters an environment conducive to academic success, as students are capable of learning, setting goals, and identifying the factors and resources necessary to achieve their desired outcomes [24].

Social Relations

Participating in extracurricular activities like sports can positively influence academic performance by fostering the development of various skills, including non-cognitive abilities, and facilitating strong social connections. Engaging in such activities offers opportunities to build interpersonal relationships with peers and adults outside the classroom, enhancing social acceptance and reducing antisocial behavior [25]. Additionally, participation in sports promotes the development of skills like teamwork and self-confidence, reinforcing traits like self-control and perseverance. It also encourages interaction with others, providing opportunities to learn from individuals who possess valuable values and skills relevant to education [26]. In summary, sports activities serve as a pathway to college attachment and a sense of belonging, contributing to the accumulation of social capital [27]. They serve as platforms for the dissemination of educational information and resources, encouraging students to adhere to norms and positively impacting the overall academic environment.

Need to Achieve a Goal

Engaging in sports not only fosters social relationships but also reinforces the importance of goal achievement [28]. Participants learn to perform in front of an audience and navigate feedback from others, including coping with both success and failure. This aspect becomes even more significant in team sports, where individuals are assigned specific roles and must collaborate ethically with teammates [29, 26].

Mental Health Capital

Engaging in sports also offers psychological benefits to participants, including increased happiness, stress tolerance, self-perception, concentration, sociability, and extroversion, while reducing the likelihood of experiencing depression and anxiety [30, 31]. Consequently, college students involved in sports are anticipated to develop skills aligned with educational values, thereby enhancing their academic performance.

Time for Sporting Aspirations

While there are arguments supporting a positive relationship between sports participation and academic performance, it's important to consider counterarguments suggesting that a student's involvement in sports activities may not always lead to favorable academic outcomes. While certain

qualities among physically active students might positively influence academic performance, other factors could have a negative impact. For instance, the time and energy devoted to sports programs may result in less time allocated to studying, potentially compromising academic performance [32]. Additionally, the significant effort exerted in sports participation may hinder the development of necessary knowledge, skills, and competencies in academic areas [23]. If students allocate excessive hours to sports, they may prioritize these activities over classroom attendance and academic aspirations [23]. In essence, sports participation may be perceived as a zero-sum game, where increased focus on non-academic pursuits detracts attention from academic performance.

CONCLUSION

The relationship between sports participation and academic achievement is complex, influenced by various factors and mechanisms. While sports offer additional cognitive benefits compared to general physical activity, excessive focus on sports may compromise academic performance, particularly among high-level athletes. The demands and aspirations associated with competitive sports may detract from academic tasks, leading to negative consequences in academics. Despite the potential positive impact of sports on developing skills consistent with educational values and fostering

social relationships, there are concerns regarding time allocation and potential diversion of attention from academic pursuits. Therefore, while sports participation can contribute to holistic development and mental health capital, it's essential to strike a balance between athletic endeavors and academic goals to optimize overall student success and well-being. This nuanced understanding underscores the importance of comprehensive support systems and strategic time management strategies to ensure that students derive maximum benefits from both sports participation and academic pursuits.

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