



The Connection Between Sport and Study

Krish Jangir

PGP student, IIM Indore

Abstract- Sport and academic study are often viewed as rivals competing for a student's limited hours in the day. Yet a growing body of psychological, neuroscientific, and educational research suggests that the relationship between the two is considerably more cooperative than competitive. This paper synthesises existing literature to examine how participation in sport and regular physical activity influences academic performance, the cognitive mechanisms that connect exercise to learning, and the life skills that sport cultivates in students. Five questions guided the investigation: the statistical relationship between sport and grades, the biological pathways linking physical activity to brain function, the role of sport in building discipline and time management, the effect of sport on stress and mental well-being, and the risks associated with excessive or elite-level training. The findings indicate that moderate, regular participation in sport is consistently associated with better grades, stronger executive function, and lower academic stress, while very high training loads can compress study time and, at the elite level, may coincide with lower academic performance. The paper concludes that sport, practised in balance with academics, is more often an ally of study than its adversary.

Keywords- Sport participation, physical activity, academic performance, cognitive function, time management, student well-being.

I. Introduction

Walk into any school or college campus and the same scene repeats itself: one group of students is gathered around a cricket pitch or a basketball court, while another is bent over textbooks in the library. For decades these two worlds have been treated as separate, even oppositional - time spent on the field is widely assumed to be time taken away from the desk. Parents and teachers alike voice the same worry: does playing sport help a student's education, or does it quietly chip away at it?

The question matters more today than ever. Education systems are placing growing emphasis on holistic development, and institutions from school boards to business schools formally reward sporting achievement alongside academic merit. At the same time, the demands of competitive sport - early-morning practice, weekend tournaments, travel, and physical fatigue - are real and cannot be dismissed. Anyone who has tried to balance a cricket season with examination preparation knows that the conflict, where it exists, is not imaginary.

This paper sets out to examine what the research evidence actually says about the relationship between sport and study, rather than relying on intuition or anecdote. It reviews findings from sports science, neuroscience, psychology, and education research to build a balanced picture of what sport gives to academic performance, what it can take away, and under what conditions each is more likely to happen.



II. Objectives of the Study (Points of Investigation)

To structure this review, the paper investigates five specific questions:

1. Is there a measurable relationship between participation in sport and academic grades or test scores?
2. What physiological and neurological mechanisms might explain how physical activity affects learning and cognition?
3. Does participation in sport help students develop discipline, time management, and other skills that support academic work?
4. How does sport affect student stress levels and mental well-being, and does this, in turn, affect academic performance?
5. What are the risks or trade-offs of sport participation - particularly at competitive or elite levels - for academic outcomes?

III. Research Methodology

This paper follows a desk-based, secondary research design rather than collecting new primary data. Conducting an original survey or experiment was outside its scope; instead, findings were drawn from peer-reviewed journal articles, systematic reviews, and meta-analyses accessed through sources such as PubMed, MDPI journals (including the International Journal of Environmental Research and Public Health), Frontiers, ScienceDirect, and Nature Reviews Neuroscience. Priority was given to large-sample studies, systematic reviews, and longitudinal research where available, since these provide more reliable evidence than single small studies. Wherever findings conflicted, both sides of the evidence are presented rather than only the result that fits a single narrative.

IV. Literature Review

Sport Participation and Academic Grades

The most direct evidence on this topic comes from large-scale studies that statistically link sport participation with grades. Using data from the U.S. National Longitudinal Study of Adolescent Health, Rees and Sabia (2010) found that participation in sport was associated with an increase in GPA of approximately 0.17 points after controlling for a wide range of individual and family characteristics; however, they cautioned that the evidence for a causal effect was limited, since more disciplined or motivated students may simply be more likely to take up sport in the first place.

Findings from outside the United States generally point in the same direction. Chen et al. (2021) found a positive, dose-dependent relationship between team-sport participation and self-reported academic performance in a nationally representative sample of Chinese high school students - the more team sports a student played, the better their reported grades tended to be. In a separate study of nearly 28,000 Chinese primary school children, Zhang et al. (2023) reported that sport participation was positively correlated with performance across three core subjects: language, mathematics, and English.



Not every study agrees, however. A systematic review by Esteban-Cornejo et al. (2015), which examined 20 studies on adolescents published between 2000 and 2013, found that half reported a positive association between physical activity and academic performance, while nearly a fifth found no association at all, and one even reported a negative relationship. This mixed picture suggests that the sport-grades link, while real, is neither universal nor guaranteed - its strength likely depends on factors such as the type of sport, the intensity of participation, and the student's broader circumstances.

The Neuroscience Behind the Sport-Study Link

Beyond statistical correlations, researchers have looked for a biological explanation of why physical activity might support learning. In an influential review, Hillman, Erickson, and Kramer (2008) described how aerobic exercise benefits the brain at several levels: it increases blood flow and oxygen delivery to brain tissue, raises levels of brain-derived neurotrophic factor (BDNF) - a protein that supports the growth of new neural connections- and is linked to structural changes in regions associated with memory, such as the hippocampus.

These biological changes appear to translate into measurable cognitive benefits. The same systematic review by Esteban-Cornejo et al. (2015) found physical activity to be positively associated with cognitive performance in several of the studies reviewed, particularly improvements in attention and the ability to inhibit distracting impulses - both qualities that matter directly for sustained study and exam performance. In short, sport may not only build healthier bodies but may also leave the brain itself better equipped for the kind of sustained, focused thinking that academic work demands.

Sport as a Teacher of Discipline and Time Management

A different strand of research looks beyond biology to the habits and character traits that sport instills. Competitive sport imposes a demanding, externally fixed schedule - practice at a set time, matches that cannot be rescheduled, conditioning that must be sustained - and students who play sport seriously often have little choice but to develop strong time-management skills simply to keep up with both commitments.

Cricket offers a particularly clear illustration of this. The sport demands patience over the course of a long innings or a full day's play, discipline in repeating the same technical routines in the nets, and the ability to read a constantly shifting situation and adjust strategy accordingly - skills that map closely onto what sustained academic work requires: patience through a long syllabus, discipline in daily revision, and the ability to adapt one's approach when an exam or project does not go as planned. More broadly, qualitative research on student-athletes consistently describes similar coping strategies across sports, including prioritising tasks by deadline, building fixed study blocks around training schedules, and communicating proactively with teachers or professors about competing commitments. These are precisely the kinds of self-regulation skills that educational psychologists associate with stronger academic performance, regardless of whether they were first learned on a sports field.

Sport, Stress, and Mental Well-Being

Academic performance is not determined by cognitive skill alone; a student's mental state shapes how well that skill can be applied. Here too, sport and physical activity



appear to play a protective role. A 2026 systematic review by Martin-Rodriguez and Gonzalez-Prieto, which analysed 38 studies covering more than 20,000 university students, found a consistent association between higher levels of physical activity and lower levels of stress, anxiety, and depression, alongside greater overall subjective well-being. Since chronic stress and anxiety are well known to impair concentration, memory, and exam performance, this stress-buffering effect represents an indirect but meaningful pathway through which sport can support academic success.

The Other Side: Risks and Trade-offs

The evidence reviewed so far might suggest that more sport is always better for academic outcomes - but the research does not support such a simple conclusion. Pinto-Escalona et al. (2022) studied over 1,100 Spanish adolescents and found that young elite athletes, training at the highest competitive level, achieved lower overall academic performance than non-elite control students, a difference that held across both sexes and across different types of sport. The likely explanation is straightforward: time and energy are finite, and at sufficiently high training volumes, hours that might otherwise go to study are instead consumed by practice, travel, competition, and physical recovery.

This trade-off becomes more visible the higher the level of competition climbs. Research on collegiate-level student-athletes commonly cites training and competition commitments in the range of twenty to thirty additional hours per week on top of a full course load - a volume of time that leaves comparatively little room for error in scheduling. The pattern that emerges across the literature, then, looks less like a straight line and more like an inverted U: academic benefits accumulate with moderate, regular sport participation, but can erode once training demands become extreme, particularly without strong institutional support for combining athletic and academic careers.

V. Results: Summary of Key Findings

Table 1 summarises the principal studies reviewed in this paper, the populations they examined, and the direction of the relationship each found between sport or physical activity and academic outcomes.

Table 1: Summary of Key Studies on Sport Participation and Academic Performance

Study	Population / Sample	Key Finding	Direction
Rees & Sabia (2010)	U.S. adolescents (Add Health dataset)	Sport participation linked to a ~0.17-point higher GPA; causal evidence limited	Positive (modest)
Esteban-Cornejo et al. (2015)	Systematic review of 20 studies on adolescents	50% of studies positive, 18% no association, 5% negative for academic performance	Mixed, mostly positive
Chen et al. (2021)	Nationally representative sample of Chinese high schoolers	Dose-dependent positive link between team-sport participation and self-reported grades	Positive



Zhang et al. (2023)	~28,000 Chinese primary school children	Sport participation positively correlated with grades in language, maths and English	Positive
Hillman, Erickson & Kramer (2008)	Review of human and animal studies	Aerobic exercise improves brain function via BDNF, blood flow and neurogenesis	Positive (mechanism)
Martin-Rodriguez & Gonzalez-Prieto (2026)	Systematic review of 38 studies, 20,000+ university students	Higher physical activity linked to lower stress, anxiety and depression; higher well-being	Positive (indirect)
Pinto-Escalona et al. (2022)	1,126 Spanish adolescents, elite athletes vs. controls	Elite athletes showed lower overall academic performance than non-elite peers	Negative (at elite level)

Taken together, these results converge on three broad conclusions. First, at moderate levels of participation, sport is associated with equal or better academic performance than non-participation, an effect supported across very different populations - American, Chinese, and Spanish - and across age groups from primary school to late adolescence. Second, this relationship appears to be at least partly explained by genuine biological and psychological mechanisms - improved brain function, lower stress, and stronger self-management skills - rather than simply reflecting that disciplined students gravitate toward sport. Third, the relationship is not unconditionally positive: at elite or highly intensive levels of competition, the time and energy costs of sport can outweigh its cognitive and psychological benefits, producing a measurable academic disadvantage relative to peers.

VI. Discussion

Returning to the five questions that guided this review: Is there a measurable relationship between sport and grades? Yes, and it is more often positive than negative, though not universal. What mechanisms explain this? A combination of neurological changes that sharpen attention and memory, and the transfer of self-discipline and time-management skills from the field to the desk. Does sport build character traits relevant to study? The evidence on time management and resilience suggests it does, particularly in sports - like cricket - that demand sustained patience and adaptive strategic thinking. Does sport affect mental well-being, and does this matter for study? Yes; regular physical activity appears to meaningfully lower stress and anxiety, both known to interfere with academic performance. Finally, are there risks? Clearly yes, particularly when training intensity reaches elite levels without adequate academic support structures.

The overall picture that emerges is best described not as a simple cause-and-effect relationship but as a balance to be managed. For the average student playing sport at a recreational or moderately competitive level, the evidence strongly favours continued participation: the cognitive, psychological, and character benefits appear to outweigh the time cost. For students competing at an elite level, the same evidence is a caution rather than a discouragement - it points to the need for deliberate planning, institutional



flexibility, and realistic expectations, rather than for abandoning either sport or academic ambition.

VII. Limitations of the Study

This paper has several limitations worth acknowledging. First, because it relies on secondary, desk-based research rather than original data collection, its conclusions are only as strong as the underlying studies it draws upon, several of which are correlational and cannot fully establish cause and effect. Second, students who choose to participate in sport may differ systematically from those who do not - in motivation, family support, or socioeconomic background - making it difficult to isolate sport's independent effect from these other factors.

Third, the studies reviewed span different countries, age groups, and educational systems, including the United States, China, and Spain, and their findings may not transfer directly to other contexts, such as the Indian school or university system, where representative large-scale data on this specific question remains limited. Future research specific to Indian students - across school, undergraduate, and management education levels - would help confirm whether these international patterns hold locally.

VIII. Conclusion and Recommendations

The evidence reviewed in this paper does not support the common assumption that sport and study are natural rivals. For most students, moderate and regular participation in sport is associated with equal or improved academic performance, sharper cognitive function, lower stress, and stronger self-management skills - benefits that plausibly transfer directly to academic work. The exception lies at the extreme end of the spectrum: when training intensity reaches elite competitive levels, the time and energy costs can begin to outweigh the benefits, particularly without strong support systems in place.

Based on this evidence, three recommendations follow:

- Students should treat regular sport participation as compatible with, rather than opposed to, academic goals, while staying alert to the point at which training commitments begin to crowd out study time.
- Educational institutions should consider building structured support - flexible scheduling, academic mentoring, or protected study time - for students who train or compete at a high level, rather than leaving them to manage the trade-off alone.
- Given the limited India-specific evidence identified in this review, researchers and institutions in India would do well to study this relationship directly within Indian schools, colleges, and management programmes, rather than relying solely on findings from other countries.



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