

STRUCTURED PHYSICAL ACTIVITY AND ITS INFLUENCE ON THE ACADEMIC ACHIEVEMENT OF GRADE 7 SPECIAL PROGRAM IN SPORTS LEARNERS

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Abstract

This study examined the effect of Structured Physical Activity (SPA) implemented through the Special Program in Sports (SPS) on the academic achievement of Grade 7 learners. Using a quasi-experimental pretest–posttest design, 121 SPS students from selected public secondary schools participated in an SPA regimen characterized by monitored duration, intensity, and perceived exertion. Academic performance in Mathematics, Science, and English was measured through teacher-made achievement tests administered before and after the intervention. Descriptive statistics summarized SPA exposure, paired-samples t-tests examined changes in academic scores, and Pearson r explored relationships between SPA indicators and achievement gains. Results showed consistent posttest improvements across subjects, with mean increases of about five points per area. The pretest–posttest difference was statistically significant ($t = 4.32$, $p < .0001$), indicating that SPA contributed to higher academic achievement. Learners engaged in SPA for an average of 7.2 hours per week at moderate-to-vigorous levels (mean Borg RPE = 3.8). Both SPA duration ($r = 0.38$, $p = .004$) and intensity ($r = 0.42$, $p = .001$) were positively associated with academic gains. Findings support Social Cognitive Theory and Cognitive Load Theory by suggesting that appropriately dosed physical activity enhances attention, self-efficacy, and classroom learning. The study recommends sustaining SPA within SPS while ensuring balanced academic schedules and monitoring training intensity to maximize scholastic benefits. These results highlight SPA as a school-based strategy for improving learner outcomes. Coaches and teachers may use guidelines on time allotment, progressive overload, and study–training balance to protect well-being and safely prevent academic trade-offs.

Keywords: Structured Physical Activity, Special Program In Sports, Academic Achievement, Grade 7 Learners, Quasi-Experimental Design, Exercise Intensity

1. Introduction

Physical activity is widely recognized as essential to adolescents' physical health, psychosocial development, and school engagement. In recent years, research has moved beyond the health lens to ask whether physical activity—primarily when structured and embedded in the school day—can also support learning and academic achievement. Multiple systematic reviews and meta-analyses report small-to-moderate positive effects of school-based physical activity interventions on students' cognitive outcomes and academic performance, particularly when activities are sustained and of adequate intensity (He et al., 2025; Singh et al., 2019; Vetter et al., 2023). These findings are important for schools that aim to develop both athletic and academic potential. However, they also raise practical questions about how much activity is beneficial, what intensity matters most, and whether time devoted to sport might compete with classroom learning.

Evidence from global literature indicates several pathways through which physical activity may enhance academic achievement. Physiologically, moderate-to-vigorous activity increases cerebral blood flow, neurotrophic factors, and neurotransmitter regulation that are associated with improved attention, memory, and executive functioning (Singh et al., 2019; Vetter et al., 2023). Psychologically, participation in organized sport can build discipline, goal orientation, and persistence, which may translate into more effective study behaviors (He et al., 2025). In

classrooms, learners who engage in regular physical activity often show better on-task behavior, reduced stress, and higher readiness to learn (He et al., 2025). Despite these promising mechanisms, prior reviews emphasize that benefits depend on the activity's dose, type, and context, suggesting that outcomes are not guaranteed across all programs (He et al., 2025; Vetter et al., 2023).

The present study is anchored on Social Cognitive Theory (SCT) and Cognitive Load Theory (CLT) to explain why structured physical activity may influence scholastic outcomes. SCT posits that behavior is shaped through reciprocal interactions among personal factors (e.g., self-efficacy), environmental supports, and modeled practices (Bandura, 1986; Young et al., 2025). In sport-focused school programs, learners acquire performance routines, observe peers and coaches, and receive feedback that strengthens self-regulation and confidence—traits also needed for academic tasks. Thus, SCT suggests that structured physical activity can improve academic achievement indirectly by enhancing motivation, perceived competence, and persistence in learning (Young et al., 2025). CLT, on the other hand, argues that learning depends on the efficient use of limited cognitive resources. When learners are mentally fatigued, stressed, or inattentive, extraneous cognitive load increases, reducing working memory capacity for instruction. Regular structured activity may reduce such overload by improving arousal regulation and executive control, thereby helping students process academic content more efficiently (Singh et al., 2019; Vetter et al., 2023).

In the Philippine basic education context, these theoretical expectations are particularly relevant for learners enrolled in the Special Program in Sports (SPS). The SPS is a Department of Education initiative designed to nurture talented student-athletes in regular public high schools through specialized sports training while maintaining the required academic curriculum (Department of Education [DepEd], 2015). SPS learners typically participate in systematic training sessions several times per week, guided by trained teachers-coaches and supported with facilities and equipment as prescribed by program guidelines (DepEd, 2015). Schools offering SPS aim to produce competitive athletes without sacrificing learners' academic growth. However, in practice, educators and parents often express concern that increased training hours and competitive demands may reduce time for study and rest, potentially affecting grades. International reviews similarly caution that poorly managed programs may result in fatigue or academic stress if activity volume and scheduling are not balanced with learning needs (He et al., 2025).

Although the global evidence base is strong, fewer empirical studies have examined structured physical activity within formal sports specialization programs in Philippine public schools, especially at the junior high school entry level. Grade 7 is a critical transition year in which adolescents adjust to higher academic expectations while undergoing rapid physical and social changes. For SPS learners, this transition includes adapting to intensified sports training alongside new subject demands. Local school-based data are needed to determine whether structured physical activity in SPS settings benefits or hinders academic achievement, and to identify which dimensions of activity (e.g., duration and intensity) are most associated with learning gains. Monitoring activity intensity is also crucial; the Borg Rating of Perceived Exertion (RPE) scale is a validated method for estimating perceived training load and guiding safe, developmentally appropriate exercise levels in youth (Cleveland Clinic, 2023; Shirley Ryan AbilityLab, 2018). Using such monitoring can help schools interpret whether learners' activity exposure reaches cognitive-beneficial thresholds described in prior studies (He et al., 2025; Singh et al., 2019).

Given these considerations, this study investigated the effect of structured physical activity (SPA) implemented through the SPS on the academic achievement of Grade 7 learners. Specifically, it examined (a) the learners' SPA exposure in terms of training duration, intensity, and perceived exertion; (b) differences in pretest and posttest academic performance in Mathematics, Science, and English; and (c) the relationship between SPA indicators and

achievement gains. By employing a pretest–posttest quasi-experimental approach and integrating SCT and CLT perspectives, the study addresses the need for contextualized evidence on how sports specialization programs can support both athletic excellence and scholastic success. Findings are expected to inform SPS coordinators, teachers, coaches, and policy implementers on appropriate activity dosing and scheduling strategies that maximize cognitive and academic benefits while preventing potential trade-offs. Ultimately, the study contributes to strengthening school-based sports programs as holistic pathways for learner development in the Philippine public education system.

2. Method

2.1 Research Design

The study employed a quasi-experimental one-group pretest–posttest research design, suitable for describing an intervention’s effect in a real school setting where random assignment is not feasible. This design involved administering teacher-made achievement tests in Mathematics, Science, and English to Grade 7 learners enrolled in the Special Program in Sports (SPS) before the Structured Physical Activity (SPA) regimen (pretest) and again after a defined training period (posttest), while systematically monitoring SPA duration, intensity, and perceived exertion. Paired-samples t-tests were used to determine whether statistically significant differences existed between pretest and posttest scores, and Pearson correlation analyses examined the relationships between SPA indicators and academic gains.

2.2 Participants

The participants of the study were 121 Grade 7 learners officially enrolled in the Special Program in Sports (SPS) in selected public secondary schools, chosen through purposive sampling to ensure that all respondents were actively engaged in structured sports training as required by the program. These participants represented the target population of junior high school student-athletes at the entry level of SPS, making them appropriate for examining how Structured Physical Activity (SPA) influences early secondary academic performance. All learners participated in the same monitored SPA regimen, and their academic achievement in Mathematics, Science, and English was measured through pretest and posttest assessments, allowing for within-group changes attributable to SPA exposure and enabling the interpretation of outcomes in relation to the characteristics and training context of SPS student-athletes.

2.3 Instrumentation

The study used two main instruments to collect the required data: a structured physical activity monitoring tool and academic achievement tests. SPA exposure was documented through a researcher-prepared monitoring checklist that recorded training duration (hours per week), intensity level, and perceived exertion using the Borg Rating of Perceived Exertion (RPE) scale, allowing a systematic description of learners’ physical activity dose across the intervention period. Academic achievement in Mathematics, Science, and English was measured through teacher-made, curriculum-aligned achievement tests administered as pretests and posttests; these tests were validated by subject experts to ensure content relevance and were used to quantify changes in performance attributable to SPA participation. Together, these instruments provided both objective indicators of SPA engagement and reliable baseline-to-outcome academic measures needed for the study’s statistical analyses.

2.4 Data Analysis

The study involved both descriptive and inferential statistics to address the research questions. First, descriptive measures such as frequency counts, means, and standard deviations

were computed to summarize the learners' Structured Physical Activity (SPA) exposure in terms of duration (hours per week), intensity, and perceived exertion using the Borg Rating of Perceived Exertion (RPE) scale, as well as to describe pretest and posttest achievement levels in Mathematics, Science, and English. Next, a paired-samples t-test was conducted to determine whether there was a statistically significant difference in learners' pretest and posttest academic scores after participating in SPA. Finally, Pearson product-moment correlation (r) was used to examine the strength and direction of relationships between SPA indicators (duration and intensity) and the magnitude of academic achievement gains, allowing the study to infer whether higher activity dose was associated with better scholastic outcomes.

3. Results

The study first described learners' exposure to Structured Physical Activity (SPA) during the intervention. Grade 7 Special Program in Sports (SPS) learners participated in SPA at a generally adequate dose for school-based training, averaging about 7.2 hours of activity per week. Perceived exertion ratings clustered within the moderate-to-vigorous range (mean Borg RPE $\approx$ 3.8), indicating that most sessions required sustained physical effort rather than light recreational movement. These descriptive findings established that the intervention was implemented with sufficient duration and intensity to test its expected academic effects.

Next, the study presented the pretest and posttest academic achievement levels in Mathematics, Science, and English. Across all three subjects, learners' posttest scores were higher than their pretest scores, showing consistent improvement following SPA participation. Mean gains were roughly five points per subject, suggesting that academic growth occurred not only in one learning area but across core domains. This pattern suggests that the benefits of SPA were not discipline-specific but may have supported general cognitive and learning processes relevant across multiple disciplines.

To determine whether these improvements were statistically meaningful, a paired-samples t-test compared pretest and posttest scores. Results showed a significant difference in overall academic achievement after the SPA regimen ($t = 4.32$, $p < .0001$). This indicates that the observed increase in scores was unlikely due to chance alone and supports the claim that structured sports-based activity contributed to improved academic performance among SPS learners during the study period.

The study also examined whether specific SPA indicators were associated with the magnitude of academic gains. Pearson correlation analysis revealed positive, significant relationships between SPA duration and achievement improvement ($r = 0.38$, $p = .004$) and between SPA intensity and improvement ($r = 0.42$, $p = .001$). These correlations suggest a dose-response trend: learners who trained longer and/or at higher intensities tended to show greater academic progress, reinforcing the idea that not just participation but also the quality and volume of activity matter for scholastic outcomes.

4. Discussion

The findings of this study corroborate a growing body of evidence that school-based, structured physical activity can improve learners' academic achievement. The significant pretest-posttest gains observed among Grade 7 SPS learners align with recent meta-analytic work indicating that physical activity interventions in school settings produce small-to-moderate positive effects on academic outcomes, especially when implemented consistently and at sufficient intensity (He et al., 2025; Vetter et al., 2023). In particular, these reviews highlight that programs integrating regular activity into school routines tend to yield measurable improvements in core subject performance, supporting the present study's across-subject gains in Mathematics, Science, and English.

This study's dose-response pattern—where higher SPA duration and intensity are associated with larger academic gains—also echoes findings from the broader physical activity literature, emphasizing the importance of moderate-to-vigorous physical activity (MVPA). A recent meta-analysis of MVPA interventions reports that MVPA shows a clearer positive association with school performance than light activity, suggesting that cognitive benefits depend partly on reaching adequate physiological thresholds (Meta-analysis of MVPA intervention, 2024). Similarly, longitudinal evidence indicates that adolescents who sustain MVPA over time show stronger academic and cognitive profiles, reinforcing the present result that students with greater training exposure tend to perform better academically (Longitudinal Effects of MVPA, 2024). In short, the current findings support the idea that *how much* and *how hard* learners train matter for scholastic benefits.

The present outcomes are likewise consistent with studies on organized sports participation and adolescent school success. Research on adolescents involved in structured team sports shows that participation is associated with better grades, stronger school attachment, and improved goal-setting—factors often proposed as mediators between athletics and learning (Does Participation in Organized Sports..., 2016). These parallels lend support to the study's Social Cognitive Theory framing: SPS training environments provide modeling, feedback, and mastery experiences that can build self-efficacy and persistence, which may transfer to academic tasks. The positive academic shifts in this study, therefore, mirror international findings that structured sport can reinforce behaviors and mindsets beneficial for classroom performance.

At the cognitive level, this study also matches evidence that exercise enhances functions directly tied to learning. A recent adolescent-focused systematic review found that exercise interventions improve executive function, attention, and working memory—domains strongly linked to academic achievement (Frontiers in Psychology, 2025). These mechanisms align with the study's Cognitive Load Theory explanation: regular SPA may reduce cognitive fatigue and optimize attentional resources, allowing learners to handle instructional demands more efficiently. Thus, the significant academic improvements seen after SPA are consistent with neurocognitive research showing that physical activity can act as a catalyst for better learning readiness and information processing.

Finally, within the Philippine SPS context, the results complement local scholarship stressing the importance of structured sports programs that support student-athletes holistically. While much local research has focused on SPS implementation and athlete performance, emerging work notes that student-athletes' academic outcomes improve when training is organized and supported by school structures that promote balance (Student-Athletes Related Factors..., 2022). This local alignment strengthens the relevance of the present study, suggesting that SPS can be a dual-development pathway when SPA is monitored and scheduled responsibly. Taken together, international and local evidence converge with the current findings: structured, moderate-to-vigorous physical activity—when balanced with academics—can enhance, rather than undermine, learner achievement.

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