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Healthy School Activation Program: A Physical Activity Education and Intervention Strategy to Reduce Sedentary Behaviour in Elementary Students

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Abstract
The Healthy School Activation program was designed to address the growing concerns of sedentary lifestyles, limited health knowledge, and low physical activity among elementary school students. It seeks to cultivate healthier behaviors, improve learning focus, and promote a collaborative school culture involving students, teachers, and parents.This qualitative study involved 120 fifth grade students from two elementary schools in Muara Bulian, divided into intervention and control groups. Ten teachers participated as key informants. Data collection methods included questionnaires, anthropometric assessments, and semi-structured interviews. The intervention led to a 35% increase in students' physical activity levels and improved health knowledge from 40% to 85%. A notable reduction in body mass index was observed among overweight students. Positive shifts were also reported in students' attitudes toward physical activity, accompanied by enhanced focus and peer interaction in the classroom. Findings suggest that the program is effective in promoting active and healthy lifestyles among elementary students. The program adopts a collaborative strategy involving educators and families, providing a feasible model for promoting active lifestyles and fostering a supportive, health oriented school culture that can be implemented broadly and sustainably.

Keywords: Educational Intervention, Elementary School Students, Healthy School, Physical Activity, Sedentary Lifestyle

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INTRODUCTION

Promoting health through structured school-based interventions is vital during the elementary years, a critical period for children's physical and cognitive development (Hasan et al., 2023). Schools, in collaboration with families, are instrumental in shaping health-conscious behaviors and fostering lifelong healthy habits (Nugraha et al., 2018; Nurochim, 2020). In response to the increasing prevalence of sedentary lifestyles among school-aged children, a comprehensive approach is necessary—one that integrates educational components with practical, movement-based strategies to increase physical activity levels (Kohl et al., 2013). The school environment, where

students spend a significant portion of their time, provides an accessible and strategic platform to implement such interventions effectively (Grauduszus et al., 2024).

Physical activity programs must be inclusive, enjoyable, and adaptable to students' diverse needs, thereby enhancing their motivation to move and engage (D'Anna et al., 2024). Embedding activity beyond physical education classes and throughout the daily school routine further reinforces healthy behaviors (Hanifah et al., 2023). Achieving this requires the active involvement of teachers, staff, and parents, forming a supportive ecosystem that facilitates and sustains regular physical activity among students (Goh et al., 2020; Strong et al., 2005). Globally, sedentary behavior has emerged as a critical public health concern. The World Health Organization (2020) reports that more than 80% of adolescents worldwide fall short of the recommended 60 minutes of daily physical activity. This lack of movement is linked to increased risks of obesity, metabolic conditions such as type 2 diabetes, and mental health issues. In Indonesia, the situation is equally troubling; according to the Ministry of Health, around 60% of school-aged children do not meet recommended activity levels (Kemenkes, 2018), while the Basic Health Research indicates that 19.8% of children aged 5–12 years are classified as overweight.

Research has shown that there is a significant relationship between physical activity and various health outcomes, including anxiety levels among students with sedentary lifestyles (Hidayah et al., 2025). Additionally, factors such as gender, stress management, and living environment also play a crucial role in influencing anxiety levels in new students (Suharmanto, 2024). While physical education has the potential to instill essential lifestyle habits, many schools in Indonesia encounter difficulties in integrating activity-based learning into the academic curriculum. Space limitations, heavy academic loads, and a lack of innovative program models remain major barriers. Nonetheless, research confirms that integrating physical activity into the school day supports not only physical health but also cognitive and emotional well-being (Donnelly et al., 2016). This highlights the need for new, culturally grounded, and evidence-based models to enhance children's activity levels in meaningful ways.

The Healthy School Activation program is one such approach that integrates traditional games, structured exercise, and lifestyle education to promote physical and mental health. The program includes content on balanced nutrition, the importance of exercise, and the risks of a sedentary lifestyle (Pratiwi et al., 2025). Through a participatory design that involves students, teachers, and parents, it seeks to create a holistic and sustainable culture of health. Early behavior change has been shown to produce long-term health benefits (Swinburn et al., 2011), and this program aligns with that goal by engaging the entire school community.

Implementation of the program follows a three-phase structure: socialization, where health messages and program objectives are introduced interactively; simulation, involving guided physical activities and collaborative exercises; and evaluation, which includes reflection, feedback, and assessment of behavioral changes. However, the burden of academic responsibilities often limits teacher participation in such initiatives, particularly in areas such as physical and health education (Lanos et al., 2022). Therefore, an intervention that is both integrative and feasible is needed to support broader educational and health objectives. Although several studies have explored school-based physical activity interventions, most focus primarily on structured exercise or curricular physical education, without fully incorporating cultural elements or stakeholder collaboration. There remains a notable gap

in models that merge education, traditional practices, and community engagement within the elementary school context in Indonesia. The novelty of the Healthy School Activation program lies in its ability to reframe physical activity as enjoyable and culturally relevant, utilizing traditional play and inclusive participation to drive behavioral change (Wulandari & Lasari, 2024; A'yunin et al., 2023).

Furthermore, the program emphasizes stakeholder involvement—students, teachers, and parents—as a foundation for sustainability. This study aims to evaluate the effectiveness of the Healthy School Activation program in increasing physical activity, enhancing health knowledge, developing healthy lifestyle habits, and reducing sedentary behavior among elementary school students. It also seeks to examine changes in students' attitudes toward physical activity, improvements in classroom engagement, and the extent of collaboration fostered among school stakeholders in building a health-oriented school environment (Sufyan & Sufyan, 2022; Negara et al., 2024; Megawati & Sofia, 2021).

METHODS

This study adopted a qualitative research approach to examine the effectiveness of the Healthy School Activation program in promoting physical activity and healthy behaviors among elementary school students in Muara Bulian. The design emphasized contextual understanding and participant experiences, allowing for an in-depth analysis of behavioral change and program impact. The study involved 120 fifth-grade students from two elementary schools, who were purposively selected and assigned to either an intervention group or a control group. Additionally, 10 teachers participated as supporting informants to provide complementary insights on the intervention's implementation and outcomes.

The intervention was conducted over three consecutive days and consisted of three structured phases: socialization, simulation, and evaluation. During the socialization phase, students were introduced to the program's objectives through interactive discussions and educational sessions that highlighted the importance of physical activity and healthy lifestyle choices. The simulation phase engaged students in guided physical activities, cooperative games, and role-playing exercises aimed at encouraging active participation and peer interaction (Aman et al., 2024). The final evaluation phase involved reflective discussions, follow-up assessments, and shared feedback from both students and teachers regarding observed changes in behavior and engagement.

Primary data were gathered using a structured and validated questionnaire focused on three dimensions: physical activity levels, health-related knowledge, and attitudes toward physical activity. The instrument consisted of 15 items distributed across three sections. The first section measured daily physical activity frequency such as outdoor play, participation in physical education, home-based activity, and sedentary behavior using a 4-point scale (1 = never to 4 = every day). The second section evaluated health knowledge through five true-or-false items covering key concepts such as the benefits of exercise, the risks of prolonged sitting, dietary habits, hydration, and myths about physical activity. The third section assessed students' attitudes using a 4-point Likert scale (1 = strongly disagree to 4 = strongly agree), focusing on aspects such as enjoyment, motivation, confidence, and the perceived effect of physical activity on academic performance.

The questionnaire's content validity was confirmed by expert review, while its reliability was verified through internal consistency analysis, including Cronbach's Alpha testing. In addition to the survey data, anthropometric indicators such as Body Mass Index (BMI) were recorded, and semi-structured interviews were conducted with a subset of participants. These qualitative insights were used to enrich the understanding of behavioral shifts and participant experiences, allowing for a comprehensive analysis of the intervention's effectiveness and implications for future health-promotion programs in educational settings.

RESULTS AND DISCUSSION

The findings revealed a notable improvement in students' physical activity following the implementation of the Healthy School Activation program. Specifically, students in the intervention group exhibited a 35% increase in physical activity levels, rising from 45% to 80%, while the control group showed only a marginal 5% improvement, from 47% to 52%. This substantial difference underscores the positive influence of the intervention in fostering more active behavior among participants. Consistent with previous studies, limited opportunities for movement and prolonged inactivity are key contributors to low physical activity among children, which may adversely affect their functional development (Norito et al., 2022).

In addition to physical activity, health knowledge among students in the intervention group also increased markedly from 40% prior to the intervention to 85% afterward, reflecting a 45% improvement. Furthermore, a reduction in body mass index (BMI) was observed among overweight students in the intervention group, with the average BMI decreasing from 23.5 to 21.8, indicating the potential of this program to influence physical health outcomes. These results are summarized in Table 1 and further illustrated in Figure 1, which compare changes in physical activity, health knowledge, and BMI before and after the intervention.

Table 1. Comparison of Physical Activity and Health Knowledge Pre- and Post-Intervention

Indicator	Pre-Intervention	Post-Intervention	% Change
Physical activity level (Intervention Group)	45%	80%	+35%
Physical activity level (Control Group)	47%	52%	+5%
Health knowledge (Intervention Group)	40%	85%	+45%
BMI (Overweight Students - IG)	Avg. 23.5	Avg. 21.8	-1.7 units

Note:
Physical activity level is measured from the frequency of daily physical activity.
Health knowledge is assessed based on students' understanding of the benefits of physical activity.
BMI is obtained from physical measurements before and after the program.

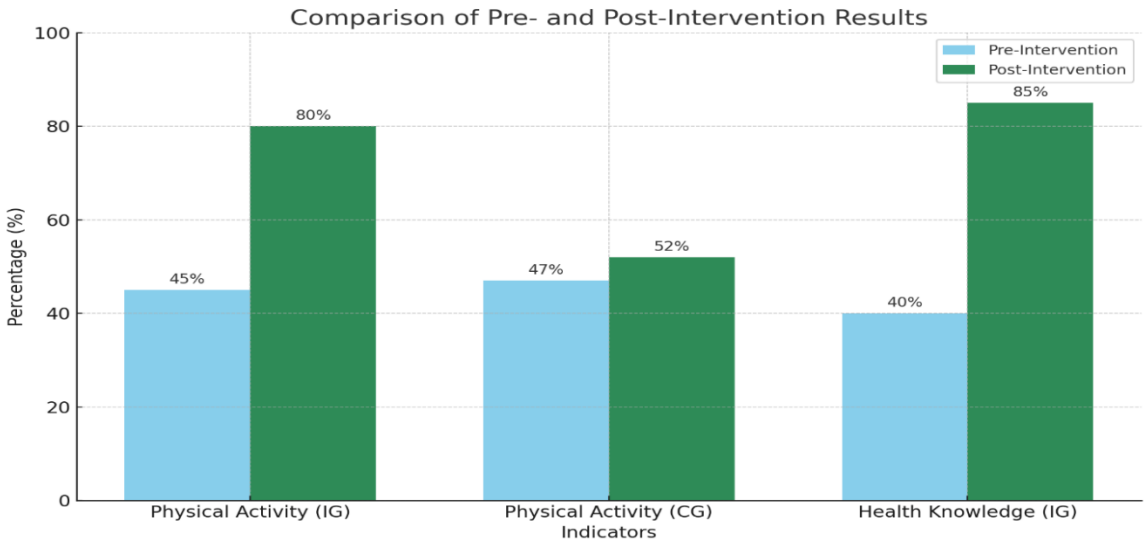

Figure 1. Physical Activity Levels (Intervention & Control) and Health Knowledge

Assessment of students' body mass index (BMI) also demonstrated favorable outcomes (See Figure1). In the intervention group, there was a reduction in the average BMI, and notably, approximately 15% of students who were initially categorized as overweight reached a healthier weight category six months after program implementation. These results align with prior research by Liu (2019), which emphasized that physical activity-centered interventions can significantly contribute to reducing childhood obesity rates. Students' understanding of health and the value of physical activity showed remarkable improvement; prior to the intervention, only 40% of participants recognized the benefits of being physically active, whereas this figure rose to 85% post-intervention, indicating a substantial enhancement in students' health literacy and awareness of active lifestyle choices.

In terms of perception, qualitative findings from student interviews revealed a considerable shift. Before the program, many students regarded physical activity as exhausting and unappealing, often preferring sedentary activities such as playing with digital devices. However, post-intervention, students began to associate physical activity with enjoyment and improved physical well being. Based on the results of in-depth interviews with students and teachers, various positive changes were found after the implementation of the Healthy School Activation program. The following are the results of NVivo-based interviews that summarize coding, themes, and representative quotes from all participants in Table 2.

Table 2. Based Thematic Matrix – Healthy School Activation Program

	Theme	Sub-theme (Node)	Participant (Code)	Coded Reference	Representative Quote
1.	Perceptual Shift Toward Physical Activity	From negative to positive perception	S5	Node ref: 1.1.1	"Before, I didn't like exercising it made me tired. But now, I enjoy it because the activities are fun, and all my friends joined too".
		Physical activity as fun & social	S7	Node ref: 1.1.2	"I used to just sit alone. Now I always play with my classmates, and it makes me feel more confident".

	Theme	Sub-theme (Node)	Participant (Code)	Coded Reference	Representative Quote
2.	Reduction in Sedentary Behavior	Less screen time, more outdoor play	S9	Node ref: 2.1.1	"I usually play on my phone during break time. But now I play outside with my friends. I feel happier and more active".
		Independent initiative to move	S4	Node ref: 2.1.2	"Sometimes before class, I do stretches by myself. I also remind my friends to drink water".
3.	Academic and Cognitive Improvement	Increased focus post-activity	T3	Node ref: 3.1.1	"After joining the program, the children became more focused in class. They were usually sleepy in the second period, but now they're alert and more responsive".
		Reduced fatigue during lessons	T1	Node ref: 3.1.2	"Now they don't get sleepy too fast during lessons they are more engaged after the morning activities".
4.	Social and Emotional Development	Increased peer interaction	T5	Node ref: 4.1.1	"Some students who were usually quiet started participating in group games. They became more open and even took initiative to lead small activities".
		Group motivation and collaboration	S4	Node ref: 4.1.2	"Now we play together and remind each other to move. It's more exciting with friends".
5.	Health Literacy and Awareness	Understanding health behaviors	T1	Node ref: 5.1.1	"They now understand why exercise matters and talk about healthy eating too, which they rarely did before".
		Recognizing long-term benefits	S9	Node ref: 5.1.2	"I know now that sitting too long is not good. I try to stand up and move even at home".
6.	Sustainability Challenges	Decline in motivation post-program	T2	Node ref: 6.1.1	"The students enjoyed the activities, but after a few weeks, they slowly returned to their old habits unless we reminded them".
		Need for structured follow-up	T3	Node ref: 6.1.2	"If this is done regularly every week, I believe the results would last longer".
7.	Environmental & Institutional Barriers	Inadequate facilities	T4	Node ref: 7.1.1	"It would be great if the school had a special space like a garden or a gym for regular movement".
		Schedule conflicts	T2	Node ref: 7.1.2	"Sometimes it clashes with academic lessons, so we need to find a better time slot".

Note:
Themes : Derived from recurring patterns in participants' narratives.
Sub-themes (Nodes) : Created in NVivo as child nodes under each parent theme.
Participant Codes : "S" for student, "T" for teacher; anonymized to maintain ethical standards.
Coded References : Internal tracking references (optional in print but visible in NVivo).
Representative Quotes : Captured as evidence supporting each node/theme.

Several student narratives reflected a significant shift in perception toward physical activity following the implementation of the Healthy School Activation program. For instance, students who initially viewed exercise as tiring or unappealing reported increased enjoyment and enthusiasm when the activities were integrated with playful elements and social participation. One student noted a newfound enjoyment in movement, attributing it to the presence of friends and the fun design of the activities. This perceptual transformation from seeing physical activity as burdensome to perceiving it as enjoyable and socially engaging mirrors the findings of previous studies indicating that positive attitudinal changes can promote sustained participation in physical activity (Sallis et al., 2000).

Teachers also observed meaningful changes beyond the physical domain. Students demonstrated heightened awareness of healthy living and began to independently adopt simple health-promoting behaviors, such as stretching before lessons or reminding peers to stay hydrated. The program was credited with improving classroom dynamics, where previously disengaged or fatigued students became more alert and responsive after participating in structured physical activities (Chen et al., 2025). One teacher emphasized this shift by observing that students were more attentive during lessons, particularly in the earlier periods of the school day, suggesting that active breaks positively influenced learning readiness. Social interaction and emotional development were also positively impacted. Group-based activities encouraged collaborative play and strengthened peer relationships (Wei et al., 2025). Teachers reported that previously introverted students began participating more actively in social interactions during recess and group sessions. These psychosocial improvements highlight the program's holistic impact on students' development.

However, the sustainability of these changes presented a notable challenge. Several teachers noted that students' initial enthusiasm gradually diminished once the program ended, emphasizing the need for ongoing support and follow-up strategies to maintain momentum. Structural constraints, such as overlapping academic schedules and the lack of dedicated physical activity spaces, were cited as additional barriers. As one teacher suggested, the availability of school facilities such as a designated activity area could significantly enhance the continuity of physical engagement (Chen et al., 2025).

Overall, both observation and interview data suggested that the program fostered not only behavioral change but also fundamental shifts in health literacy and daily routines among students. The initiation of self regulated actions, such as active breaks and conscious eating habits, indicates the internalization of health-promoting behaviors (Aman et al., 2024). These outcomes reinforce the potential of school-based interventions like the Healthy School Activation program to serve as a scalable and sustainable model in addressing sedentary lifestyles while supporting cognitive, emotional, and social development in elementary school settings.

CONCLUSION

The results of this study reinforce the effectiveness of the Healthy School Activation Program as a school-based intervention to enhance physical activity levels and reduce sedentary behaviors among elementary students. The program's impact stems from its integrative and engaging approach, which combines structured physical

exercises with health education tailored to the developmental characteristics of children. This holistic design successfully encouraged behavioral shifts, as reflected in increased participation in daily physical activity, enhanced health literacy, and more positive attitudes toward active living. More importantly, students not only moved more but began to perceive physical activity as enjoyable and socially meaningful a transformation essential for long term habit formation. These findings directly address the central research question by demonstrating how a short-term, contextually relevant intervention can influence both the physical and psychological dimensions of student health. However, limitations must be acknowledged. The intervention's duration only three consecutive days limits the assessment of long-term behavioral sustainability. Moreover, the study's implementation in a limited geographic context may restrict the generalizability of findings to other regions or educational systems. Future studies should consider longitudinal research designs to examine behavioral maintenance over time, and explore how school-family-community collaborations can sustain healthy behavior changes. Additionally, integrating mobile health (mHealth) tools and digital support systems may enhance motivation and tracking beyond the classroom.

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Author Contribution	:	TBN: Conceptualization, Writing - Original Draft, Editing and Visualization; MSA: Validation and Supervision; KW: Writing - Review & Editing, Formal analysis, and Methodology; ASP: Review & Editing, Formal analysis. CP: Review & Editing, Formal analysis.
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