



The active break model: increasing physical activity engagement in supporting student learning in the classroom

El modelo de descanso activo: aumentar la participación en la actividad física para apoyar el aprendizaje de los estudiantes en el aula

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Abstract

Introduction: Engaging in physical activity offers significant benefits, particularly during childhood. Therefore, different approaches are needed to ensure children's involvement in physical activity.

Objective: This study aimed to explore how physical activity contributes to health benefits while also motivating students to engage in learning.

Methodology: A mixed-methods explanatory design was used. The initial phase involved qualitative approaches through a case study, followed by an 8-week experiment using the Active Break Model during each lesson break and recess. The program was implemented through three methods: Brain Break and Fitness breaks in the classroom, and traditional physical activity outdoors. The sample included 37 third-grade elementary students selected via a total sampling technique. Methods used encompassed open-ended interviews and a questionnaire based on the Physical Activity Enjoyment Scale. Thematic analysis was applied to the qualitative data, while quantitative data were analyzed using a t-test.

Discussion: Results showed that students mainly engaged in physical activity during physical education classes and recess. The findings revealed differences in play behavior: boys typically participated in physical activities, while girls preferred non-physical activities. At home, both boys and girls engaged in physical activity, though this varied with the playing season. However, students spend over 3 hours daily on devices, 3 to 5 days each week.

Conclusion: Consequently, a program was developed to increase students' daily physical activity within the school environment. The goal is for students to participate in physical activities together, focusing on engaging during breaks to improve their active learning experience at school.

Keywords

Active break; model; physical activity; learning.

Resumen

Introducción: La actividad física ofrece beneficios significativos, especialmente durante la infancia. Por lo tanto, se requieren diferentes enfoques para asegurar la participación de los niños en la actividad física.

Objetivo: Este estudio buscó explorar cómo la actividad física contribuye a los beneficios para la salud, a la vez que motiva a los estudiantes a participar en el aprendizaje.

Metodología: Se utilizó un diseño de métodos mixtos explicativos. La fase inicial incluyó enfoques cualitativos mediante un estudio de caso, seguido de un experimento de 8 semanas que utilizó el Modelo de Descanso Activo durante cada recreo y descanso. El programa se implementó mediante tres métodos: descanso mental y descanso de ejercicio en el aula y actividad física tradicional al aire libre. La muestra incluyó a 37 estudiantes de tercer grado de primaria, seleccionados mediante muestreo total. Los métodos utilizados incluyeron entrevistas abiertas y un cuestionario basado en la Escala de Disfrute de la Actividad Física. Se aplicó un análisis temático a los datos cualitativos, mientras que los cuantitativos se analizaron mediante una prueba t.

Discusión: Los resultados mostraron que los estudiantes realizaron principalmente actividad física durante las clases de educación física y el recreo. Los hallazgos revelaron diferencias en el comportamiento lúdico: los niños participaron típicamente en actividades físicas, mientras que las niñas prefirieron las no físicas. En casa, tanto niños como niñas realizaban actividad física, aunque esto variaba según la temporada de juego. Sin embargo, los estudiantes pasan más de 3 horas diarias con dispositivos, de 3 a 5 días a la semana.

Conclusión: Por consiguiente, se desarrolló un programa para aumentar la actividad física diaria de los estudiantes en el entorno escolar. El objetivo es que los estudiantes participen juntos en actividades físicas, con énfasis en la participación durante los descansos, para mejorar su experiencia de aprendizaje activo en la escuela.

Palabras clave

Descanso activo; modelo; actividad física; aprendizaje.

Introduction

Engaging in physical activity offers significant advantages, particularly in the developmental stages of childhood. Engaging in appropriate physical activity for children can enhance their academic performance and social-emotional development (Erwin et al., 2022). Engaging in physical activity within the classroom contributes to the cultivation of healthy behavioral habits among students, while also enhancing their overall well-being, cognitive development, and performance in school (Brusseu & Hannon, 2015). The question remains, however, whether every school provides adequate physical activity. Implementing physical activity within schools necessitates careful deliberation regarding the duration and timing of such activities. At present, physical education classes in Indonesia are scheduled just once a week, lasting for 105 minutes. Is a total of 105 minutes enough to meet the physical activity requirements of children over the course of the week? Guidelines from the World Health Organization: It is recommended that children and adolescents participate in a minimum of 60 minutes of moderate to vigorous intensity physical activity each day, primarily focusing on aerobic exercises, consistently throughout the week. Engaging in vigorous aerobic exercise, in addition to activities that enhance muscle and bone strength, is recommended to occur at least three times a week (World Health Organization, 2020).

According to data from the Ministry of Youth and Sports of the Republic of Indonesia (2023), physical fitness assessments carried out on 1,578 children aged 10-15 years across 34 provinces in 2023 revealed that the physical fitness levels of Indonesian children are indeed concerning (Kementerian Pemuda dan Olahraga Republik Indonesia, 2023). Only 6.79% of people who were physically fit or better were taken into account. At the same time, 77.12% of children showing poor or very poor physical fitness continued in demonstrating this declining trend. The situation is exacerbated by the limited engagement in sports activities, particularly among girls (Toho et al., 2022). This is made worse by a sedentary lifestyle at home. This represents a significant issue in initiatives aimed at enhancing engagement in physical activity, as it may adversely affect health, particularly among children.

Consequently, it is essential to develop a dedicated program aimed at enhancing physical activity, particularly in childhood, as part of the school curriculum. Before moving forward, it is essential for school administrators and educators to undertake various preparations to effectively incorporate physical activity into the classroom. This includes (a) increasing awareness about the advantages of engaging in physical activity within the classroom, (b) establishing a safe environment that fosters physical activity, and (c) developing and implementing a physical activity program tailored to the fitness and maturity levels of the students in the class (Centers for Disease Control and Prevention & SHAPE America, 2018). Furthermore, the equipment used during physical activity should be considered safe for classroom use. This aims to encourage student engagement and creativity.

Engaging students through physical activity, particularly within the school day, presents a viable strategy for enhancing their involvement. Typically, students engage in all activities offered by the school. Consequently, implementing a physical activity program in schools is essential, alongside physical education lessons, for instance, during breaks. According to earlier studies, incorporating physical activity during class breaks is seen as a way to enhance student motivation and increase concentration during lessons (Martin & Murtagh, 2017a). Moreover, engaging in physical activity within the classroom setting is recognized as beneficial for enhancing student learning (Erwin et al., 2022). This is one of the reasons that underscore the importance of integrating physical activity into the learning process. Engaging in physical activity within the classroom setting elevates students' heart rates, which can mitigate sedentary behavior during lessons (Martin & Murtagh, 2017a; Norris et al., 2020). Engaging in physical activity during childhood and adolescence yields numerous advantages for various health outcomes, including enhanced physical fitness (both cardiorespiratory and muscular), improved cardiometabolic health (such as blood pressure, dyslipidemia, glucose levels, and insulin resistance), better bone health, cognitive benefits (like academic achievement and executive function), improved mental health (with a decrease in depressive symptoms), and reduced adiposity (World Health Organization, 2020). Moreover, engaging in physical activity can enhance students' emotional health by regulating stress and anxiety levels effectively. This facilitates students in expressing themselves more freely and engaging with their peers, thereby enhancing their social awareness and skills in building relationships (Worrell et al., 2020).

As a result, it is essential for teachers and administrators to advocate for and organize physical activity within the classroom, as it plays a significant role in fostering students' holistic development. Therefore, it is important for teachers and school administrators to support and plan physical activity in the classroom, as it can contribute to students' overall development. This research aims to boost student engagement in fulfilling their daily physical needs while at school. Through the program, it is hoped that students will actively participate, ideally turning it into a lasting habit. This will help them stay healthy and be able to adopt an active lifestyle in the future.

Method

Physical activity is often framed within the context of health, yet it also presents possibilities for looking into personal interests, motivations, and various other potentials. Understanding the fundamental motivations behind physical activity allows for a pedagogical approach that identifies valuable aspects of social life that can promote physical activity, as well as elements that should be avoided (Matias & Piggini, 2022). This study explores how physical activity serves dual purposes: addressing health needs while simultaneously enhancing student learning within the classroom environment. Engaging in active breaks through physical activity is anticipated to enhance students' motivation for daily learning. An explanatory design employing a mixed-methods approach was utilized to explore this study. This exploratory design is effective for initially identifying relevant variables that could contribute to a phenomenon and subsequently examining the connections among these variables, particularly regarding student behaviors that result in sedentary lifestyles. An Active Break Model approach is subsequently employed to tackle this issue. The Active Break Model consists of a sequence of physical activities implemented during class breaks. Prior investigations implemented activities during five-minute intervals, occurring three times daily. The session started with a brief light jog on the spot for under a minute, serving as a warm-up, and then followed by training of moderate to vigorous intensity (Drummy et al., 2016). This study, however, distinguished itself by include traditional games during breaks in addition to physical activities. This active brake model was implemented at moderate to vigorous intensity levels as well. This effort aimed to motivate students to participate in physical activity and enhance their readiness for the subsequent learning session.

Qualitative Method

The data collection employed a qualitative approach, focusing on a case study carried out within a school setting to examine the shift in students' sedentary habits. This approach was selected to achieve a deeper insight into the issue being studied (Fraenkel et al., 2012). The case study involved two physical education teachers and eight third-grade students from an elementary school. All participants expressed their willingness to participate and had obtained consent from their parents. Approval was obtained from the principal of the school where the research was conducted. This study will concentrate on daily physical activity both within the school environment and at home. This step was implemented to gain insights into the daily physical activity levels of elementary school students.

The data collection process involved semi-structured interviews that featured open-ended questions. Participants were inquired about the activities they participated in during school breaks and after school, along with the frequency of their gadget usage. Follow-up questions were asked as needed to gather further relevant details. Interviews concluded once no additional significant information was revealed (Creswell & Creswell, 2018). All interviews were digitally recorded with the consent of the participants. Descriptive content analysis was conducted utilizing inductive coding techniques, which involved multiple readings and listenings to the interview audio recordings to identify significant qualitative units. Transcripts underwent a meticulous line-by-line reading, with the analysis concentrating on the identification of significant overarching units. Responses were organized and further divided into thematic categories to facilitate data analysis. Both individuals collaborated to complete the items. Following that, the concepts under consideration were integrated into a more comprehensive and coherent structure (Virginia Braun, 2021).

Quantitative Method

After the qualitative data was revealed, an experimental study was carried out to evaluate the effects of the Active Break Model on students' levels of physical activity and learning abilities. The experimental design implemented was a one-group pretest and posttest design (Fraenkel et al., 2012) The physical activities to be carried out were as follows:

Table 1. Physical Activity in the Classroom

Application Area	Resources
Brain Brake and Fitness breaks in the classroom	https://youtu.be/i9pp5kD2gts https://youtu.be/5H8UdGEvrV8 https://youtu.be/GghrfH_YTYE https://youtu.be/2DN9nsgrQ9s https://youtu.be/yNiH9erQcFY https://youtu.be/3_nu0vuzOG0 https://youtu.be/oaDJWH400jQ https://youtu.be/TFUIPFcr_A0 https://youtu.be/fgQOGORKG5I https://youtu.be/09ldFZk8FG4 https://youtu.be/PWz1K-JaWao https://youtu.be/E0DqcXMknZA https://youtu.be/rL8xORBjyYY https://youtu.be/HHBhm77gdUQ https://youtu.be/ZZd9jeEljyo https://youtu.be/IWIMz4FZje0
Tradisional Physical Activity in Outdoor	Permainan Bentengan Permainan Galah Asin Permainan Tali Permainan Sonlah Permainan Boi-boian Permainan Gatrik

Note: The video sources used in this research refer to the channel @MovetoLearnMS and @Strong4LifeGA.

The physical activity will take place in the classroom during learning breaks, using a total sample of 37 students. In elementary schools, learning breaks take place four times. The study involved conducting activities in the classroom on three separate times and once in an outdoor setting. In-class activities will be related to those outlined in Table 1, while during breaks outside the classroom, students will participate in traditional games. The overall time committed to physical activity amounts to 45 minutes daily, excluding physical education classes (Table 2). This program will take place over a duration of eight weeks, as referenced in the study by Martin & Murtagh (Martin & Murtagh, 2017b). Subsequently, their progress will be observed as they engage in learning following the implementation of this treatment.

Table 2. Duration of physical activity time at school in the Active Brake program

Physical Activities	Duration	Place
Break 1	5 minutes	In the classroom
Break 2	5 minutes	In the classroom
Break 3	30 minutes	On the field
Break 4	5 minutes	In the classroom

Students will participate in "brain brake," which are brief intervals of physical activity, also referred to as "brain energy," periodically during the school day in the classroom. These activities are designed to support children in recharging and refocusing their minds and bodies. Moreover, incorporating brain brake enhances children's enjoyment, focus, and learning, resulting in raised engagement and more effective use of class time (Perera et al., 2015). Fitness breaks and classroom physical activity are also included, which helps reduce inactivity. Additionally, fitness breaks offer chances to activate the musculoskeletal system through physical activity (Eather, 2014) and help in enhancing students' muscular fitness.

The instrument used was a questionnaire on the Physical Activity Enjoyment Scale to assess feelings when engaging in physical activity (Chen et al., 2021). This instrument has a reliability level of 0.88. The questionnaire was given to students to measure their enjoyment of participating in these activities. Data analysis involved a t-test to determine the significant effect of the Active Break Model implementation on students' physical activity levels and learning abilities.

Results

a) Students' Physical Activities at School

Following the initial stage of the study, results from the interviews were collected. Physical activities among students at school typically occur during breaks, where they engage in play. The types of games played, however, are varied. "What types of games are typically played during school breaks?"

Student's response: during school breaks, games like "truth or dare" are played (S1).

Student's response: I like to play ball and run around (S2).

This indicates that during each break at school, both girls and boys typically participate in play activities. Nonetheless, the types of play activities they participate in vary considerably. It has been observed that girls often participate in non-physical play activities, whereas boys tend to show a reluctance towards physical activities.

b) Student Physical Activities at Home

Additionally, post-school hours, students participate in a range of activities. "What activities are typically engaged in at home following school hours?" In general, students participate in play activities at home, although this is not a daily occurrence. Every student participates in various physical activities, including cycling, spinning tops, flying kites, and other seasonal games. Nonetheless, these activities do not happen on a daily basis.

Student's response: I ride my bike and fly kites when a friend invites me. I can play for one to two hours (S3).

Student's response: I enjoy going around and playing in the water until 3 o'clock (S5).

c) Gadget Use at Home

Findings from the interviews showed that students often engage with gadgets during times when they are not playing at home. This engagement takes place after school, occurring three to five days each week. This interaction encompasses various social media platforms such as TikTok, engaging with content on YouTube, and gaming on mobile devices. The duration of these activities may extend beyond two hours.

Student's response: After school I take some time to relax by scrolling through TikTok until 2:30, then I pray, and continue watching until 6 p.m., then I read Qur'an (S1).

Student's response: I play games, scroll through TikTok, and watch YouTube until the evening (S2).

Student's response: I like to play games and watch YouTube for at least two hours and no more than five hours, which takes time away from studying the Koran (S4).

Using gadgets at home can make people less active, which is known as living a sedentary lifestyle. The World Health Organization (WHO) says children should be physically active for at least 60 minutes a day. The study found that all of the students played both physical and non-physical games during school breaks. However, the things that male and female students did were not the same. When children were at home, they did physical things based on what they wanted to do, not on a set schedule or based on the season. Also, students who use their gadgets too much may be more likely to live a sedentary lifestyle.

Students can suffer when they don't get enough exercise. To help students meet their daily needs for physical exercise, the "Physical Activity in the Classroom and Traditional Physical Activity in the Outdoor" program was created to get them to be more active while they were at school.

d) The Influence of Physical Activity on Learning Breaks at School

The findings from a one-month (28-day) intervention involving Physical Activity in the Classroom and Traditional Physical Activity Outdoors indicated that students demonstrated active participation in physical activity. The feedback from students regarding the physical activity was positive. The videos presented were enhanced by music, which significantly boosted student engagement during the class.

Figure 1. Brain brake and Physical activities in classroom



Teacher's response: the children were very happy with the physical activities during the lesson break. They looked smiling and enthusiastic following the various movements in the video. Although the movements were sometimes not the same as the video, all the children moved during this short break (GR1).

Teacher's response: the students were excited to do the moves in the video because it had music accompanying it (GR2).

Student's response: I like to exercise during the shift of lesson hours, plus music so I can dance (S7)

The image above shows that when students participated in physical activities, they engaged actively. Additionally, every student showed enjoyment during the activities, as evidenced by their smiles. These activities were carefully designed and performed to ensure that students fulfill their daily physical activity requirements. Engaging in physical activity within the classroom significantly impacts students' enjoyment of learning, a crucial element in fostering their motivation to learn (Department of Health et al., 2018; Martin & Murtagh, 2017a). This image shows the students' engagement with the video being presented, as they actively participate in the movements showed.

Figure 2. Traditional Physical Activity in Outdoor



Teacher's response: during break time, students are directed to play traditional games. The students are seen having fun with the game (GR1).

Student's response: happy to be able to play rope games with friends (S12)

Every student participates in traditional outdoor play activities. These activities during breaks offer students a chance for engaging and active breaks. Facilitating enjoyable interactions among students fosters an environment where they can feel at ease, secure, valued, and joyful. This involvement enhances students' enjoyment of learning and leads to improved performance (Thapa et al., 2013a). The engage-

ment and connecting experienced during physical activity facilitate enhanced learning outcomes thereafter. Engaging in physical activity has demonstrated positive effects on cognitive functions, including attention, memory, and self-regulation, all of which are essential for achieving academic success. The observed cognitive enhancements correlate with enhanced academic outcomes, evidenced by improved grades and increased graduation rates among students participating in regular physical activity (Zaragoza-Peláez et al., 2024). A study into the impact of physically active classrooms on the educational outcomes of school-aged children revealed that such environments can lead to modest enhancements in academic achievement when compared to traditional, sedentary classrooms (Bedard et al., 2018). The findings indicate that students in the classroom engage actively in physical activities. They actively engage in traditional games with great enthusiasm. Additionally, to substantiate these findings, a "Physical Activity Enjoyment Scale" was utilized, producing the following results:

Table 3. Results of Students' Physical Activity Enjoyment Scale in Physical Activities

		Paired Samples Test					t	df	Sig. (2-tailed)
		Paired Differences							
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Posttest_Eks - Pretest_Eks	25.73469	5.83859	.37301	24.99996	26.46943	68.991	36	.000

The analysis indicates a significant increase in students' enjoyment of physical activity during the learning break, as evidenced by the data presented above. This suggests that the program has the potential to influence student enjoyment in the classroom setting. This is anticipated to enhance engagement in subsequent learning.

Discussion

Findings show that students are actively engaged in various physical activities throughout school breaks. Classroom breaks serve as a viable option to address the physical activity needs of students throughout the school day. Incorporating physical activity into the classroom setting can increase the amount of time students engage in physical activity, aiding them in achieving the national guideline of at least 60 minutes of physical activity each day (Drummy et al., 2016). In addition to increasing daily physical activity, children have the opportunity to socialize with one another in an enjoyable environment. Offering students chances to work together and engage with one another in an enjoyable manner can foster an atmosphere where they feel safe, comfortable, accepted, and happy (Centers for Disease Control and Prevention, 2009).

Music-based videos also affect student engagement in physical activity at school. Music has the potential to elevate the enjoyment of experiences related to physical activity, particularly within the realm of physical education. Choosing suitable songs for various activities and their intensities may reduce negative physiological responses and enhance overall engagement (Ellis & Salmoni, 2021). Listening to music while exercising has been linked to positive psychological responses, including improved affective valence and decreased perceived exertion (Peter C. Terry et al., 2020). It has been shown that listening to music while working out produces positive psychological responses like elevated affective valence and decreased perceived exertion. Interacting with music can enhance physically challenging tasks, leading to better performance and increased enjoyment (Fritz et al., 2013).

Engaging in physical activity during breaks is believed to enhance students' motivation and enjoyment of learning. When students are prepared and find learning fun, they tend to participate more actively. Including physical activities in the classroom not only boosts enjoyment but also serves as a key motivator. These activities, typically done during break times between lessons, aim to better prepare students for upcoming lessons. Building a sense of connection between students, teachers, and peers can foster greater engagement, enjoyment, and academic achievement (Thapa et al., 2013). Well-planned physical activities are expected to improve overall learning quality and help meet students' daily physical activity guidelines, aligned with WHO recommendations. Longer-term studies, such as over a whole

semester, are needed to understand how break-time physical activity impacts students' fitness and academic performance. Policymakers should also consider making these breaks a standard part of elementary school curricula. However, this study has limitations, including that although students participate actively in physical activities during class and breaks, the resulting learning outcomes have not yet been evaluated.

Conclusions

Increasing student physical activity may promote classroom learning activities. Incorporating breaks during class serves as an opportunity for increased physical activity and can enhance student engagement for the next lesson. Engaging in physical activity during class has the potential to elevate the overall daily physical activity levels of students. Moreover, students show increased enthusiasm for learning when they engage directly in physical activities at school, alongside their physical education classes. It is anticipated that students engaging in physical activity will maintain an active and healthy lifestyle over the course of their lives, thereby enhancing their ability to participate in various future endeavors.

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