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ANALYSIS OF ACADEMIC ABILITY AND PHYSICAL ACTIVITY OF EXCESSIVE GADGET USERS IN RANCAKALONG DISTRICT

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ABSTRACT

Excessive gadget use among elementary school students is a growing educational and health concern because it can disrupt the balance between academic learning, physical activity, and social-emotional development. This study analyzed the academic ability and physical activity of excessive gadget users in several elementary schools in Rancakalong District using a convergent parallel mixed-methods design guided by the PRECEDE-PROCEED framework. Quantitative data were obtained from an academic ability test, a Likert-scale screening instrument, and the International Physical Activity Questionnaire-Short Form (IPAQ-SF), whereas qualitative data were collected through observations and interviews with students, parents, and teachers. The quantitative sample consisted of 52 students in grades IV, V, and VI, and six students were purposively selected for in-depth IPAQ-SF and qualitative analysis. The mean academic score was 8.33 out of 20 and was significantly below the minimum competency standard of 12 ($t(51) = -11.36$; $p < 0.001$); only four students (7.69%) reached proficiency. IPAQ-SF results showed 5 participants (83.3%) in the moderate physical activity category and 1 participant (16.7%) in the low category, but sitting time remained high at 3-7 hours per day. Qualitative findings explained this active-sedentary paradox through concentration problems, physical discomfort, instant gratification, inconsistent parental mediation, and school-level regulation. The study suggests that excessive gadget use is associated with low academic achievement and unbalanced daily patterns, requiring integrated digital literacy, active learning, parental mediation, and school-based physical activity interventions.

Keywords: *Academic Ability, Convergent Parallel Mixed Methods, Elementary School, Excessive Gadget Use, Physical Activity and PRECEDE-PROCEED*



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INTRODUCTION

Elementary education is expected to support children's cognitive, physical, and social-emotional development. This is in line with the holistic purpose of basic education, which views learning as part of children's overall growth (UNESCO, 2021). At this level, learning is not only influenced by memory of subject matter. It is also shaped by daily habits that help children stay focused, follow classroom routines, and participate consistently in learning activities (OECD,

2020). Physical activity also plays an important role because movement supports health, mental well-being, and cognitive functioning among school-aged children (WHO, 2022). In this context, digital technology can support learning when used appropriately. However, problems may arise when gadget use begins to dominate children's routines and reduces their time for active play, direct communication, homework, and sustained concentration. Thus, the concern of this study is not the existence of technology itself, but how non-essential gadget use can become a competing part of children's daily lives.

Recent literature on screen time shows that excessive gadget use cannot be understood only from the number of hours spent in front of a screen. Current guidance emphasizes the importance of content quality, family routines, and parental mediation rather than applying one rigid time limit for all children ((AAP), 2024). Even so, recreational screen use still needs to be controlled so that it does not replace sleep, physical activity, and social interaction (Staff, 2024). In the Indonesian elementary-school context, gadget use of around one to two hours per day is often recommended as a reasonable limit to help protect concentration and reduce addictive tendencies (Sugiarti & Andyanto, 2021). Gadget use of more than two hours per day has also been associated with excessive intensity and may contribute to lower academic performance (Goodwood, 2021). Screen time among children aged 6-14 years has also been described as a global lifestyle issue that is related to learning behavior and health (Qi et al., 2023).

At the policy level, Kurikulum Merdeka encourages schools and teachers to design learning that is more flexible and responsive to students' needs (Ministry of Education Research, and Technology, 2024). In addition, the national digital-literacy framework highlights four main areas of competence, namely Digital Skill, Digital Ethics, Digital Safety, and Digital Culture (Informatika & Center, 2021). The 2024 learning outcomes for Informatics state that digital literacy and computational thinking at the SD/MI level are integrated into other subjects, such as Pancasila Education, Bahasa Indonesia, Mathematics, and Science, rather than taught as a separate subject (BSKAP, 2024). These policies show that digital competence has become an important part of education. However, in practice, schools still face difficulties in responding to children's digital environment outside the classroom. Games, videos, social media, portable access, and instant digital rewards often compete with school routines, outdoor play, sleep, and direct social interaction.

Preliminary information from elementary schools in Rancakalong District also showed that gadget use for games, videos, and social interaction had become a common after-school habit. In several cases, this routine competed with homework, outdoor play, and rest time. This condition makes Rancakalong a relevant research site because the problem is not limited to screen duration. It is also related to study discipline, physical activity, concentration, and social participation. In other words, excessive gadget use in this context needs to be understood as part of a broader imbalance in students' daily routines. Excessive gadget use may influence academic ability through several pathways. Rapid digital reward can make children more accustomed to instant stimulation, while classroom learning often requires patience, persistence, and self-regulation (Ponti, 2023). Higher screen exposure has also been linked to lower psychological well-being, which may affect children's motivation and readiness to learn (Twenge & Campbell, 2020). In addition, long sitting time may reduce opportunities for gross motor movement, postural variation, and physical activity (Tremblay et al., 2017). Reduced movement can contribute to fatigue, discomfort, and lower concentration during learning. Therefore, sedentary behavior should not be viewed only as a health issue, because it may also affect academic readiness and students' willingness to complete challenging learning tasks.

Previous studies have discussed several related issues. (Singh, 2021) examined screen media use and academic performance. (Alonso-mart et al., 2021) discussed physical activity and self-regulation. (Hale & Guan, 2022) examined sleep and concentration. (Lubans, 2021) focused on physical activity interventions. However, these studies have generally examined academic performance, physical activity, sedentary behavior, sleep, or self-regulation separately. Fewer studies have integrated academic ability, physical activity, sedentary behavior, and the qualitative experiences of students, parents, and teachers in one elementary-school context. This study

addresses this gap by using a convergent parallel mixed-methods design. The PRECEDE-PROCEED framework was used to organize the findings into predisposing factors, such as knowledge, preferences, and instant gratification; enabling factors, such as gadget access and school facilities; and reinforcing factors, such as parental discipline, teacher guidance, and peer norms (Kim et al., 2022). Therefore, this study aims to analyze the academic ability and physical activity of elementary school students who use gadgets excessively in Rancakalong District and to formulate implications for school- and family-based interventions.

METHOD

This study employed a convergent parallel mixed-methods design. Quantitative and qualitative data were collected within the same fieldwork period, analyzed separately, and then merged during interpretation to produce meta-inferences. This design was selected because statistical findings about academic achievement, Likert-scale responses, and IPAQ-SF scores needed to be explained through observations and interviews with students, parents, and teachers. The use of a convergent design follows mixed-methods guidance in which different forms of evidence are brought together to determine whether they confirm, complement, or diverge from one another (Creswell & Plano Clark, 2018). The integration stage was also used to develop meta-inferences from the relationship between quantitative trends and qualitative themes (Fetters & Tajima, 2022).

Phase	Quantitative strand	Qualitative strand	Integration
Data collection	Academic test and Likert scale (n = 52); IPAQ-SF (n = 6)	Observation and interviews with students, parents, and teachers	Collected during the same fieldwork period
Separate analysis	Descriptive statistics and one-sample t-test	Thematic coding and PRECEDE-PROCEED mapping	Results compared by convergence and divergence
Meta-inference	Academic and physical activity patterns	Explanatory experiences from school and home	Joint display used to formulate implications

Table 1. Flow of the convergent parallel mixed-methods design

The study was carried out in five elementary schools in Rancakalong District, namely SDN Rancamedalwangi, SDN Cibunar, SDN Citungku, SDN Cupuwangi, and SDN Rancakalong. The quantitative data involved 52 students from grades IV, V and VI. These students were identified through parental reports, Likert-scale screening results, and teacher recommendations. They then participated in the academic ability test and the Likert-scale screening. In this study, excessive gadget use referred to non-essential gadget use for more than two hours per day, especially for activities such as playing games, watching videos, or using social media. This information was obtained from parental reports and students' responses. From the 52 students, six participants were selected purposively for more detailed IPAQ-SF and qualitative analysis. The selection considered teacher recommendations, differences in gadget-use patterns, willingness to participate, parental permission, and the students' ability to complete the instruments.

The instruments used in this study consisted of an academic ability test, a Likert-scale screening instrument, the International Physical Activity Questionnaire-Short Form (IPAQ-SF), observation sheets, interview guides, and documentation. The academic test was designed as a grade-level achievement test with a maximum score of 20 and a minimum competency standard or KKM of 12. This test was used as a local indicator of students' academic mastery. The Likert-scale instrument was analyzed descriptively at the item level to identify students' tendencies related to gadget preference, concentration, emotional responses, physical complaints, interest

in movement, peer interaction, and daily sitting time. Before the reliability analysis, the negatively worded item was reverse-scored so that all items had the same measurement direction. Based on the responses of 52 students across 10 Likert-scale items, the Cronbach's Alpha value was 0.645, indicating moderate internal consistency and sufficient reliability for descriptive and exploratory analysis. The IPAQ-SF was used to measure students' physical activity and sitting time. This instrument has been widely used for physical activity surveillance, including validation studies among adolescents (Djurdjević et al., 2024).

Variable/construct	Indicator or Sub Indicator	Instrument/source	Data use
Excessive gadget use	Non-essential use > 2 hours/day; games, videos, social media	Parental report and Likert screening	Participant identification and contextual interpretation
Academic ability	Score out of 20; KKM = 12; proficiency status	Grade-level academic ability test	Mean, percentage, and one-sample t-test
Physical activity	MET-minutes/week; activity category; sitting time	IPAQ-SF	Descriptive classification and sedentary pattern analysis
Learning and behavioral symptoms	Concentration, daydreaming, boredom, physical complaints, parental supervision	10-item Likert scale	Item-level frequency and percentage analysis
Qualitative context	Physical, emotional, social, parental, and school factors	Observation, interviews, documentation	Thematic analysis and PRECEDE-PROCEED mapping

Table 2. Research Instrument Variables

Quantitative data were collected through the academic test, Likert-scale responses, and IPAQ-SF. Meanwhile, qualitative data were obtained through observations of students' daily behavior and interviews with students, parents, and teachers. Documentation was also used to strengthen the interpretation of school policies, activity patterns, and contextual information related to gadget use. The quantitative data were analyzed using descriptive statistics, including mean scores, percentages, frequency distributions, and IPAQ-SF activity categories. The main academic finding was further tested using a one-sample t-test by comparing the students' mean score with the reference value of 12 as the minimum competency standard. IPAQ-SF data were calculated using standard MET coefficients and then interpreted together with the students' daily sitting duration. The qualitative data were analyzed thematically by identifying repeated meanings from observations and interviews. These themes were then mapped into the PRECEDE-PROCEED framework, especially into predisposing, enabling, and reinforcing factors. After the quantitative and qualitative data were examined independently, the two sets of results were contrasted to determine whether they supported, complemented, or deviated from one another. Source triangulation and methodological triangulation were used to increase the study's credibility. While methodological triangulation evaluated results from tests, surveys, observations, interviews, and documentation, source triangulation compared data from teachers, parents, and students. Permission from the school, informed consent from pertinent or guardians, voluntary participation, student identity protection, and the use of participant codes rather than real names were included as ethical considerations

RESULTS

Academic Achievement Results

The academic test results showed that the students' achievement was still below the expected competency standard. The overall mean score was 8.33 out of 20, or 41.65% of the maximum score. Of the 52 students, only four students, (7.69%), reached the KKM score of 12. When viewed by grade level, the mean score increased gradually from grade IV to grade VI. However, this increase was still not enough because even the highest mean score did not reach the minimum competency standard. This finding suggests that although students showed some progress across grade levels, their academic mastery was still not sufficient. The one-sample t-test also confirmed that the students' mean score was significantly lower than the reference value of 12, $t(51) = -11.36$; $p < 0.001$. This means that the academic ability of students with excessive gadget use in this sample was statistically below the expected level.

Class	N	Mean Score	Proficient Students	% Proficient	Non-proficient Students	% not-proficient
IV	19	7,16	0	0,00	19	100,00
V	18	8,67	1	5,56	17	94,44
VI	15	9,40	3	20,00	12	80,00
Total	52	8,33	4	7,69	48	92,31

Table 3. Summary of academic ability test results

Likert Scale Results

The Likert-scale results showed that the effects of gadget use did not always appear as a direct preference. Some students showed the impact through learning-related symptoms. For instance, 18 students, or 34.6%, agreed or strongly agreed that they found it difficult to focus while the teacher explained the lesson. Furthermore, 13 students, or 25.0%, stated that they frequently daydreamed while doing assignments. Twelve students, or 23.1%, reported feeling bored or dissatisfied when faced with challenging school assignments, while seventeen students, or 32.7%, experienced physical complaints after prolonged gadget use. These results imply that the effects of gadget use were more evident in low task persistence, physical discomfort, and focus issues than in students' direct statements about preferring gadgets.

The item regarding preferring gadgets over playing outside with friends revealed an intriguing pattern. Thirty-one students, or 59.6%, said that they disagreed or strongly disagreed with this statement. Only four students, or 5.8%, expressed agreement or strong agreement. This finding can indicate a discrepancy between the students' reported and actual daily behavior. The IPAQ-SF data revealed that the chosen participants spent three to seven hours a day sitting down, even though many students did not explicitly say they preferred gadgets. Social desirability may have had an impact on this reaction since students may have realized that adults often have a more favorable opinion of outdoor play. Parental supervision was the subject of another significant discovery. According to 32 students, or 61.5% of the total, restriction by itself was not always successful unless it was accompanied by regular routines, active mediation, and alternative activities.

Level of Physical Activity.

The majority of students continued to engage in moderate levels of physical activity, according to the IPAQ-SF results from six purposively selected participants. One participant, or 16.7%, fell into the low category of physical activity, whereas five participants, or 83.3%, were classified in the moderate category. None of the participants reached the high physical activity category. Their average IPAQ-SF score was 795.33 MET-minute/week, with a range of 518 to 984 MET-minute/week. Because they reported the same activity pattern—720 MET-minutes per

week from moderate activity and 264 MET-minutes per week from walking—three participants received the same score of 984.

The majority of participants spent between three and seven hours a day sitting down, although they were not classified as physically inactive. This result suggests that a lack of physical activity was not the only issue. While some students may still fall into the category of moderate physical activity, they also spent a lot of time sitting down, particularly when engaging in screen-based activities. This condition illustrates the active-sedentary paradox, in which students exhibit a high sedentary pattern in their daily routines while still appearing physically active in some activities.

Respondents' total IPAQ score (MET- minutes/week)	Total IPAQ-SF score (MET- minute/week)	Physical Activity Category	sitting Time (hours/day)
S1	624	624 moderate	4
S2	984	984 moderate	7
S3	518	518 low	7
S4	984	984 moderate	4
S5	678	678 moderate	3
S6	984	984 moderate	5

Table 4. IPAQ-SF Summary

Qualitative Findings

The PRECEDE-PROCEED framework was used to map the qualitative findings. Instant gratification, limited self-regulation, health knowledge that did not always translate into behavior, and negative emotional responses when gadget use became too intense were all risk factors. Access to devices, internet quotas, digital apps, and school facilities that might either promote or restrict healthy routines were examples of enabling variables. Peer digital norms, school policy, instructor direction, and parental control were all reinforcing variables. Anonymized coded evidence showed physical discomfort and posture-related complaints, (S1, PHY-PAIN/PHY-POS), negative emotional responses and trouble controlling use (S2, EMO-NEG/CTRL-PAR), parental strategies like quota control and delayed access (P1, CTRL-DEL/ACC-QUO), and teacher concerns about diminished learning enthusiasm, weaker peer interaction, and waning interest in physical activity (T1, SOC-OUT/PHYS-SED).

According to student interviews, using gadgets for social interaction, entertainment, and education was ingrained in everyday routines. Parents acknowledged having trouble setting consistent boundaries, but they also saw gadget management as a component of academic discipline. The teacher characterized gadgets as a double-edged sword: while they could pique students' interest, excessive use has been linked to decreased learning motivation, less social connection, and a stronger attraction to video games than outdoor activities. Four themes emerged from the observations: cognitive decline and concentration, physical resilience, emotional and social patterns, and obstacles to involvement and self-confidence. Together, these findings explain why the quantitative data showed low academic achievement, trouble focusing, physical complaints, and sedentary behavior.

Quantitative result	Qualitative explanation	PRECEDE-PROCEED category	Integrated inference
Mean academic score 8.33/20; significantly below KKM 12	Teachers and observations reported reduced concentration, passive participation, and difficulty following instructions	Predisposing	Low scores reflect learning readiness problems, not only test performance

Quantitative result	Qualitative explanation	PRECEDE-PROCEED category	Integrated inference
34.6% reported concentration difficulty; 32.7% reported physical complaints	Students' coded data indicated fatigue, eye strain, posture discomfort, and emotional regulation problems	Predisposing / Enabling	Digital routines affect cognitive and physical comfort during learning
5 of 6 participants had moderate activity, but sitting time was 3-7 hours/day	Teachers and parents reported substitution of outdoor play by gadget-based games	Enabling	The main issue is an active-sedentary paradox rather than complete inactivity
61.5% reported parental supervision	Parents reported inconsistent control and expected school support	Reinforcing	Restrictive rules require active mediation, alternatives, and school-family consistency

Table 5. Summary of Quantitative Research Results with Qualitative Explanations

DISCUSSION

The study's analytical results indicate that pupils' main exposure was excessive use of non-essential gadgets. Time for homework, outside play, sleep, and direct interaction with peers were all in competition with this exposure. Instant digital rewards, split attention, prolonged sitting, and inconsistent parental mediation or oversight were all linked to excessive gadget use at the mechanism stage. Because students become more easily distracted and less accustomed to maintaining concentration on tasks requiring prolonged effort, these factors may decrease students' learning readiness. Low academic performance, trouble focusing, physical complaints, and decreased student participation in assignments or active activities were all signs of this process. Based on the IPAQ-SF, this study's meta-inference suggests that high levels of sedentary time may coexist with moderate physical activity, creating an active-sedentary paradox. Thus, in addition to restricting screen time, the necessary intervention logic includes fostering digital literacy, active learning, parental mediation, and offering pupils engaging play-based physical activities.

The study's conclusions demonstrate that students with excessive gadget use scored significantly below the KKM but also exhibited a pattern of inadequate learning progression. Although the level remained below the anticipated threshold, the increase in mean scores from grade IV to grade VI indicates appropriate developmental progress. This is significant because it shows that learning obstacles could not be overcome by age or grade advancement alone. In school-aged children, screen use has been linked to behavioral, social, and academic results (Paulich et al., 2021). Reduced attention span, less perseverance, and decreased tolerance for tasks requiring delayed gratification are some of the ways that digital exposure may contribute to this condition. Additionally, there is recent evidence that children and adolescents who use screens have trouble focusing (Leonhardt et al., 2025). This interpretation was reinforced by the qualitative findings, since teachers and observations regularly indicated issues with focus, passive involvement, and task completion. These trends align with research showing a connection between screen use and children's cognitive readiness and executive function (Toth et al., 2025).

Through the active-sedentary paradox, the physical activity data provide a theoretical contribution. Even though the majority of the chosen participants were categorized as moderately active, several of them continued to spend a lot of time sitting down every day. This implies that using a device poses a risk that goes beyond just being immobile. Instead, children might engage in some physical activity while still sitting in front of screens for a large portion of

the day. According to current physical activity guidelines, children's healthy growth requires them to move about a lot and spend less time sitting still (WHO, 2020). Long periods of sitting can lead to eye tiredness, postural discomfort, and decreased physical freshness, all of which may indirectly affect students' preparedness to learn and engage in classroom activities (Saunders et al., 2020). By demonstrating that replacement may be partial rather than absolute, this interpretation strengthens previous claims that screen time replaces movement. Therefore, the distribution of daily time is just as crucial in elementary school settings as the total amount of activity (Muhtar & Lengkana, 2021).

There is also a difference between reported preference and actual conduct, according to the Likert and qualitative data. Sitting time and interview data revealed strong digital routines, even though many students did not explicitly say that they preferred technology to outdoor activity. This disparity may be explained by social desirability bias, as children may avoid acknowledging a strong desire for gadgets since they understand that adults favor outside play. Parental supervision showed a similar disparity. Parent interviews revealed that it was challenging to consistently enforce restrictions on gadget use, despite the fact that many students stated that their parents did so. Controlling children's screen-time habits at home requires parental supervision (Parent, 2022). Restrictive mediation, however, might only temporarily lessen exposure; active mediation is also required to talk about content, set an example of balanced routines, and substitute screen time with worthwhile non-screen activities (Suárez-Álvarez et al., 2022).

Schools should not only be seen as places for academic learning, but also as environments that can support students' health and daily habits. In this study, teachers had already tried to limit gadget use and direct it toward learning purposes. However, the findings suggest that rules alone are not enough. School health programs can support educational outcomes when they also strengthen health literacy, physical activity, and a positive social-emotional climate (National Academies of Sciences and Medicine, 2020). For this reason, schools need learning strategies that involve movement, collaboration, and direct interaction, so students have meaningful alternatives to passive screen-based activities. Physical activity has been linked to children's cognitive functioning (Hillman, 2020). Physical fitness is also related to concentration performance among adolescents (Altermann & Gröpel, 2024). Therefore, physical education, play-based movement, classroom movement breaks, and digital literacy should be connected in school programs instead of being treated as separate activities (Lengkana, 2022).

The PRECEDE-PROCEED framework helps explain how the intervention can be organized more clearly. This framework is useful because it maps educational and health problems into predisposing, enabling, and reinforcing factors before an intervention is planned (Kim et al., 2022). In this study, predisposing factors include students' knowledge, preferences, instant gratification, and self-regulation. Enabling factors include access to gadgets, internet quota, school rules, learning design, and the availability of attractive physical activities. Reinforcing factors include parental consistency, teacher guidance, peer norms, and school-family communication. This mapping makes the recommendations more focused. Digital literacy should strengthen students' beliefs and self-control, schools should provide active and supportive learning environments, and parents should help maintain healthy routines at home. The joint display also produced a meta-inference: low academic scores were not caused by a single factor, but by the combination of screen habits, sedentary time, concentration difficulties, and inconsistent adult mediation. This interpretation is in line with mixed-methods integration, where quantitative and qualitative findings are combined to produce broader conclusions (Fetters & Tajima, 2022).

Several implications can be drawn from these findings. For schools, gadget policies need to clearly distinguish between educational use and distracting use. Learning activities should also include more movement and peer interaction, because physical activity can support both health and academic outcomes in children and adolescents (Lubans, 2021). For parents, supervision should not only focus on prohibition. It should also include active mediation, such as discussing gadget content, doing shared activities, and giving consistent examples of balanced digital

routines. For future researchers, larger samples, comparison groups, and longitudinal designs are needed to examine the relationship between gadget use, academic ability, and physical activity more strongly. Future studies may also use accelerometers, ecological momentary assessment, or screen-time logs to measure sitting time and gadget exposure more accurately. In addition, respondent-level Likert data should be retained so that internal consistency and item structure can be analyzed. The validity and reliability of self-report physical activity instruments also need careful attention when used with adolescents or school-aged participants (Djurdjević et al., 2024).

CONCLUSION

This study shows that excessive gadget use among elementary school students in Rancakalong District is related to low academic achievement and an unbalanced daily activity pattern. The students' average academic score was 8.33 out of 20, which was significantly below the KKM of 12. Only 7.69% of the students reached the minimum competency standard. The IPAQ-SF results also showed that most selected participants were still categorized as moderately active. However, their daily sitting time remained high, ranging from 3 to 7 hours per day. This means that the main problem was not only physical inactivity, but also the imbalance between movement, sitting time, learning routines, and digital exposure.

The main theoretical contribution of this study is the identification of an active-sedentary paradox among students who used gadgets excessively. In this condition, students may still do some moderate physical activity, but they also spend long periods sitting and show concentration problems, physical discomfort, and low academic performance. Through the PRECEDE-PROCEED framework, this condition can be understood as the result of the interaction between predisposing, enabling, and reinforcing factors. Therefore, the impact of gadget use should not be seen only as a matter of screen duration. It should also be understood as a problem of balance in children's daily development.

The practical implication of this study is that intervention should involve students, families, and schools at the same time. Students need digital literacy and self-regulation skills so they can manage their gadget use more responsibly. Schools need to provide supportive environments through active learning, movement-based activities, clear gadget policies, and attractive physical activity opportunities. Families also need to support healthy routines through consistent active mediation, not only through strict rules or prohibition. When these three sides work together, gadget use can be directed toward learning support rather than becoming a barrier to students' academic, physical, and socio-emotional development.

This study has several limitations. It was conducted in one specific district, involved a limited number of participants for the IPAQ-SF and qualitative analysis, and did not include a comparison group. The use of self-report instruments may also be affected by recall bias and social desirability. Future studies should involve larger samples, comparison groups, and longitudinal designs. Further research may also use accelerometers, ecological momentary assessment, or screen-time logs to measure physical activity, sitting time, and gadget use more accurately. In addition, respondent-level Likert data should be retained so that the psychometric quality of the instrument can be examined more carefully. Despite these limitations, this study provides useful evidence that excessive gadget use among elementary school students requires coordinated responses from both educational and health perspectives.

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