



The role of traditional games and physical activities in mitigating screen time effects among children: a systematic review

El papel de los juegos tradicionales y las actividades físicas en la mitigación de los efectos del tiempo frente a la pantalla entre los niños: una revisión sistemática

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Abstract

Introduction: Digital media provides educational and entertainment benefits, yet managing and limiting screen time is crucial to prevent negative impacts on children's health and development.

Objective: This study systematically analyzes the impact of traditional games and physical activities in reducing children's screen dependency.

Methodology: A systematic literature review using PRISMA was conducted. Searches in Scopus (2016–2025) with the keywords “traditional games,” “physical activities,” “gadget,” and “screen time” yielded 350 papers. Inclusion criteria: (1) written in English (2016–2025), (2) emphasized physical activities in learning, and (3) specifically involved games in learning. After screening, 53 journal papers remained, and 23 were finally selected across age groups and countries.

Results and Discussion: Studies show traditional games significantly influence physical activity. Spain most frequently examined this effect. Games like galah panjang, congklak, and egrang not only entertain but also foster physical activity, social skills, creativity, and cognitive intelligence, supporting children's cognitive, motor, language, social, and emotional development.

Conclusion: Traditional games play a key role in reducing children's screen time by promoting activity, social interaction, and emotional growth. Integrating them into school curricula can be a low-cost, effective intervention to reduce screen dependency.

Keywords

Children; physical activities; screen time; traditional game.

Resumen

Introducción: Los medios digitales ofrecen beneficios educativos y de entretenimiento, pero gestionar y limitar el tiempo frente a las pantallas es fundamental para prevenir impactos negativos en la salud y el desarrollo de los niños.

Objetivo: Este estudio analiza sistemáticamente el impacto de los juegos tradicionales y las actividades físicas en la reducción de la dependencia de los niños hacia las pantallas.

Metodología: Se realizó una revisión sistemática de la literatura utilizando PRISMA. Las búsquedas en Scopus (2016–2025) con las palabras clave “traditional games”, “physical activities”, “gadget” y “screen time” arrojaron 350 artículos. Los criterios de inclusión fueron: (1) artículos escritos en inglés entre 2016 y 2025, (2) que enfatizaran las actividades físicas en el aprendizaje, y (3) que involucraran específicamente juegos en el aprendizaje. Tras la selección, quedaron 53 artículos, y finalmente se eligieron 23 publicaciones de diferentes grupos de edad y países.

Resultados y Discusión: Los estudios muestran que los juegos tradicionales influyen significativamente en la actividad física. España es el país que con mayor frecuencia ha investigado este efecto. Juegos como galah panjang, congklak y egrang no solo entretienen, sino que también fomentan la actividad física, las habilidades sociales, la creatividad y la inteligencia cognitiva, apoyando el desarrollo cognitivo, motor, lingüístico, social y emocional de los niños.

Conclusión: Los juegos tradicionales desempeñan un papel clave en la reducción del tiempo frente a las pantallas en los niños, al promover la actividad física, la interacción social y el crecimiento emocional. Integrarlos en los planes de estudio escolares puede ser una intervención económica y eficaz para reducir la dependencia de las pantallas.

Palabras clave

Niños; actividades físicas; tiempo frente a la pantalla; juego tradicional.

Introduction

Excessive screen time poses significant risks to children's cognitive, social, and physical development. Numerous studies show that prolonged exposure to digital media can negatively impact attention span, memory, language acquisition, and motor skills (Goswami & Parekh, 2023; Panjeti-Madan & Ranganathan, 2023). These effects are particularly evident in early childhood, where excessive screen use is associated with speech delays, limited vocabulary, and reduced social interaction (Brzozowska & Sikorska, 2016; John et al., 2021; Raheem et al., 2023). Several studies also link screen use with impaired executive functions, although the benefits of educational content tend to diminish when total screen exposure remains high (Kim & Tsethlikai, 2024; Pedrotti, Bandeira & Frizzo, 2024). Moreover, excessive screen time is closely associated with sedentary lifestyles that reduce physical activity and overall health in children (Nwankwo et al., 2019; Devi & Singh, 2023).

Given these concerns, researchers emphasize the importance of parental regulation to ensure that screen use does not replace essential developmental activities such as sleep, active play, and face-to-face interaction (Chiu et al., 2022; Tekeci, Torpil, & Altuntaş, 2024). However, rather than focusing solely on risks, it is equally important to explore culturally grounded and developmentally appropriate strategies to mitigate these effects. One promising approach is the integration of traditional games and physical activities, which naturally encourage movement, creativity, and social interaction, while offering meaningful alternatives to sedentary digital behavior.

Although much research has documented the harms of excessive screen time, systematic evidence on the mitigating role of traditional games remains limited. Traditional games combine physical activity, unstructured play, and cultural values that collectively support children's holistic development. Evidence shows that such games enhance physical fitness, creativity, social competence, and even executive functions (Cano-Moya et al., 2023; Alvarado et al., 2025). Furthermore, their inclusive, low-cost, and cross-cultural adaptability makes them relevant strategies for schools and communities. Beyond their developmental benefits, traditional games also reinforce cultural identity and social cohesion, which are increasingly vital in today's digital era.

Therefore, this review systematically examines the role of traditional games and physical activities in reducing screen time among children, focusing on their cognitive, physical, and social impacts.

Method

This study employed a systematic literature review methodology following the PRISMA guidelines. A comprehensive search was conducted in the Scopus database using the keywords: "traditional games", "physical activities," "gadget," and "screen time". The search initially yielded 350 records.

To refine the selection, the following inclusion and exclusion criteria were applied:

1. Articles were written in English, published between 2016 and 2025.
2. Articles emphasized physical activities in learning.
3. Studies must specifically involve the use of games in learning contexts.
4. Duplicates and papers not directly related to screen time or gadget dependency were excluded.

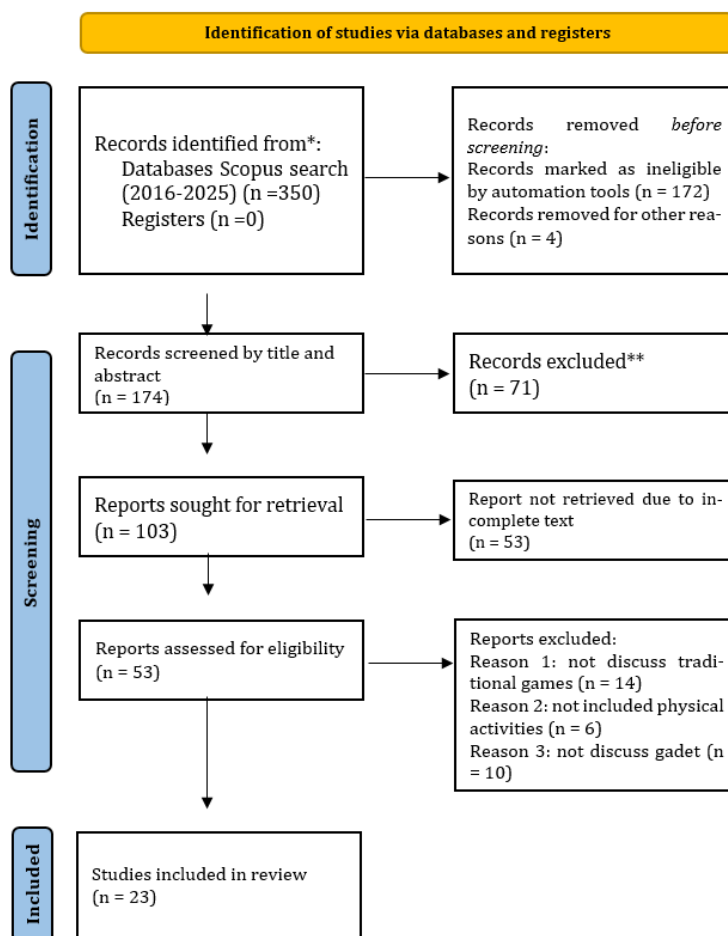
After applying these filters, 174 records remained. Further screening based on titles and abstracts reduced the number to 53 potentially relevant studies. A full-text review was then conducted, and 30 papers were excluded for not meeting the eligibility criteria. Finally, 23 studies were included in the review.

The screening process was conducted independently by the authors. Titles and abstracts were initially reviewed to identify potentially relevant studies. Subsequently, the full-text articles were assessed for their eligibility for further analysis. Any disagreements between the authors were resolved through discussion until a consensus was reached.

The selection process is summarized in Figure 1 (PRISMA Flowchart), illustrating the progression from the initial identification of records to the final included studies.



Figure 1. PRISMA Flowchart



Results

Table 1 summarizes the study results:

Table 1. Summary of Article Analysis Based on Game Types, Physical Activities, and Methodology

No.	Study Title	Game Type / Activity	Participants	Method	Country	Year	
Traditional and Cultural Games	1	Increasing Self-Esteem through Traditional Sundanese Games and Sport from Indonesia in Physical Education	Sundanese traditional games - teamwork, movement	6th grade students	Quantitative	Indonesia	2021
	2	Health-Improving and Educational Effect of Gamified Physical Activities	Gamified traditional games	Elementary students	Experimental	Poland	2021
	3	Playing Traditional Games vs. Free-Play during Physical Education Lesson to Improve Physical Activity	Local traditional games	5th-6th graders	Mixed	Kazakhstan	2022
	4	Teaching Sustainability through Traditional Sporting Games	Traditional games with environmental education	Pre-service PE teachers	Qualitative	Spain	2024
	5	Exploring Local Cultural Games as a Tool to Develop Social Skills in PE Class	Local Indonesian games	Primary school students	Qualitative	Indonesia	2023
Digital and Gamified Physical Activities	6	The Impact of Exergames on Children's Physical and Mental Wellbeing	Digital physical games (exergames)	8-12 years old	Quantitative	USA	2021
	7	Active Video Games as a Tool for Enhancing Motor Coordination in Children	Wii/Kinect games	10-13 years old	Experimental	Japan	2020
	8	Physical Literacy and Motivation in Gamified PE Lessons	Gamified PE activities	Junior high students	Mixed	Canada	2022
	9	Digital vs Traditional Games: Comparative Study on Student Engagement in Physical Education	Digital & local games	Elementary students	Comparative	Malaysia	2023

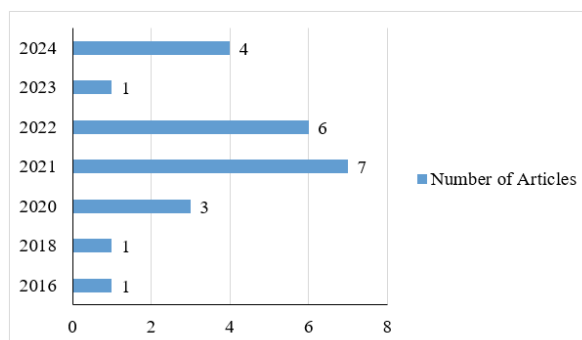
Outdoor and Cooperative Activities	10	Enhancing Cooperation and Empathy through Outdoor Physical Games	Cooperative outdoor games	Primary students	Qualitative	Portugal	2021
	11	The Effect of Cooperative Traditional Games on Social Behavior in Primary Education	Cooperative local games	4th–6th grade	Experimental	Indonesia	2022
	12	Strengthening Communication Skills through Group Physical Play	Outdoor play	Secondary students	Mixed	Turkey	2020
	13	Traditional Sports as Cultural Heritage: Physical and Educational Perspectives	Traditional sports	University students	Qualitative	Greece	2023
COVID-19 and Online Physical Activity Adaptations	14	Home-Based Physical Activities during COVID-19: A Case of Indonesia	Modified traditional games at home	Parents and children	Survey	Indonesia	2021
	15	The Influence of Lockdown on Children's Physical Activity: Digital Game Integration	Online physical activities	Elementary students	Quantitative	Italy	2021
	16	Virtual PE Lessons Using Local Games: Post-Pandemic Insights	Virtual local games	PE teachers	Qualitative	Philippines	2022
Educational Impact and Wellbeing	17	The Role of Traditional Games in Character Education	Traditional games	Elementary students	Descriptive	Indonesia	2023
	18	Physical Activity, Self-Regulation, and Emotional Wellbeing among Primary School Children	Physical games	Primary students	Mixed	Spain	2022
	19	Using Physical Play to Reduce Screen Time Effects in Early Childhood	Free-play & traditional	Kindergarten	Quantitative	South Korea	2023
	20	Integrating Traditional Games into Curriculum to Improve Motivation and Learning Outcomes	Local traditional games	PE teachers	Survey	Indonesia	2024
	21	The Psychological Benefits of Group Games for Primary Students	Cooperative physical play	Primary students	Mixed	UK	2022
	22	Promoting Physical Literacy through Traditional and Modern Games in School Settings	Mixed traditional and modern games	Students (8–12 years)	Quantitative	Australia	2023
	23	Cultural and Physical Dimensions of Play in Early Childhood Education	Traditional play	Preschoolers	Qualitative	Indonesia	2024

Publication Year

The distribution of articles on the relationship between physical activity and traditional games is shown in Figure 1. One of the effects of traditional games in students' learning at school is the increase in physical activity performed by students, so that their motor skills increase. Based on the analysis results from year to year, some studies investigate how much influence traditional games have on students' physical activity. In 2021, there were seven articles addressing this topic, followed by six articles in 2022, four articles in 2024, three articles in 2020, and one article each in 2016, 2018, and 2023. The details of the 23 articles can be seen in Table 1.

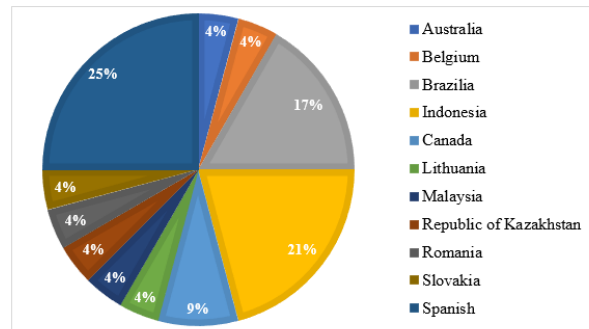
The significant increase in the number of articles in 2021 indicates a growing global concern regarding the importance of children's physical activity. This trend is closely linked to the impact of the COVID-19 pandemic, where social restrictions and lockdowns led to major lifestyle shifts, including reduced physical activity and increased screen time due to remote learning. As a response, researchers began to explore various approaches to re-establish physical routines in children, with traditional games emerging as a culturally rooted and practical alternative to promote active lifestyles among young populations.

Figure 2. Publication Year



Nationality Distribution

Figure 3. Nationality Distribution

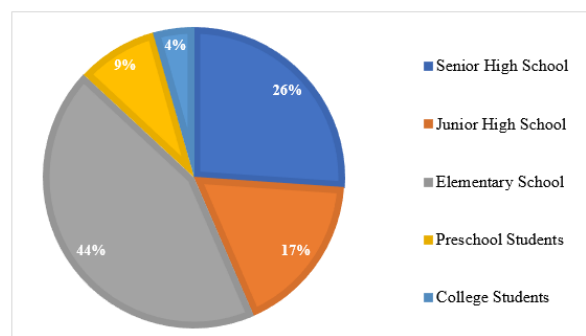


Based on the 23 articles that have been analyzed, it is known that Spain is the country that most often examines the effect of traditional games on learner activity. This can be seen in Figure 2. 25% of the 23 articles analyzed came from Spain, followed by Indonesia (21%), Brazil (17%) and Canada (9%). This is because countries like Spain and Indonesia have many traditional games that serve as part of their cultural identity. These games, passed down from generation to generation, are rich in educational, social, and physical values, making them beneficial for children's physical activity.

Research Subject

Figure 4. illustrates the different education levels of the subjects studied. It shows that the majority of the studies, 44%, involved learners in primary education. The remaining studies included learners in senior high school at 26%, junior high school at 17%, pre-school education at 9%, and university students at 4%. Based on this analysis, it can be concluded that empirical research on traditional games that can increase physical activity of learners in primary school is the most interesting context for academics. This suggests that traditional games are considered to have great potential in supporting physical activity at the primary education level (Ermenova et al., 2020).

Figure 4. Research Subject

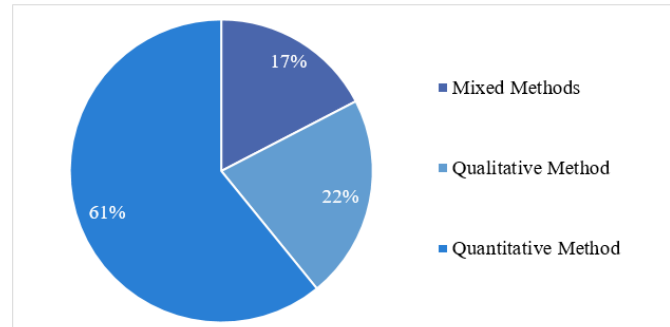


Research Method

The 23 studies reviewed related to traditional physical activity-based games in the learning process to reduce screen time. The results show that the majority of these studies used a quantitative approach, at 61%, followed by qualitative research at 22%, and mixed-method research at 17%. The distribution of research methods can be seen in Figure 5. The majority of researchers used quantitative methods to measure the extent to which traditional games contribute to increased physical activity and reduced screen time. For example, study done by Azlan et al., (2021), a study was conducted to compare the level of physical activity of secondary school students in sports learning using traditional games with those using free play methods. The results showed that sports learning with traditional games can increase

the physical activity of secondary school students. In addition, traditional games are preferred during learning compared to the free play method.

Figure 5. Research Method

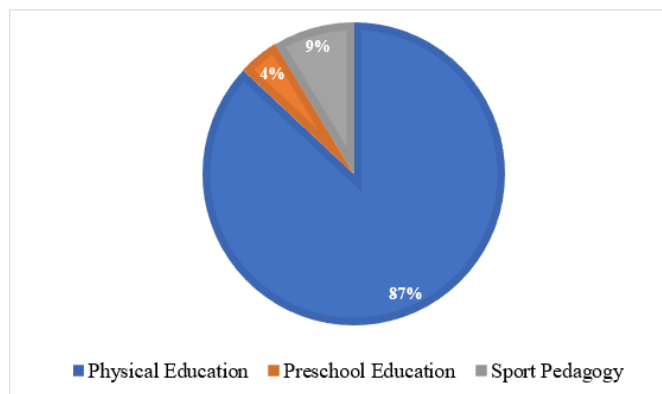


Learning Subject

The majority of subjects that incorporate physical activity in school learning are physical education, which is designed to improve motor skills, physical fitness, and students' understanding of the importance of an active and healthy lifestyle. The study analysis showed that 87% of the articles discussing physical activity focused on sports learning in schools. This suggests that physical education has a dominant role in promoting physical activity in the academic environment compared to other subjects.

In addition, a number of other articles addressed related topics, at the university level sports learning, as well as the application of physical activity in early childhood learning. The study on sports learning at university focused on addressing the decline in physical activity among students. To this end, a game-based pedagogical approach was implemented in the learning environment to increase students' responsibility, motivation and engagement in physical activity (Sotos-Martinez et al., 2024). Meanwhile, research on physical activity in early childhood learning highlights the benefits of movement and active play in supporting children's cognitive, social and motor development from an early age (Rață et al., 2024). Thus, these findings confirm that physical education is not only a key subject in the implementation of physical activity, but also contributes to a broader understanding of the benefits of active movement at different levels of education.

Figure 6. Learning Subject



Discussion

The Influence of Traditional Games on Reducing Screen Time

Traditional games are games that have existed for generations in a country and develop according to the surrounding environment and cultural processes. These games are adapted to the culture of each region, so they become part of the identity of the local community. In addition, traditional games are also a cultural heritage that is passed on from generation to generation as part of the history and stories of each nation (Ermenova et al., 2020). Traditional games play a crucial role in promoting physical activity and reducing children's dependence on screens. Unlike digital play, traditional games encourage real-world interaction, coordination, and teamwork, fostering both physical and socio-emotional growth. These games—such as galah panjang, baling selipar, congklak, and egrang—not only preserve cultural heritage but also create enjoyable learning experiences that naturally limit screen exposure.

However, the strength of existing evidence varies. Several studies demonstrate that integrating traditional games into physical education enhances learners' engagement and reduces sedentary behavior (Galan et al., 2019; Kristina et al., 2025). Nonetheless, many studies rely on small or region-specific samples and short-term interventions, which limits the generalizability of results. Few studies employ randomized controlled designs or provide follow-up measures, making it difficult to determine the long-term sustainability of these effects. Therefore, future research should employ more rigorous experimental designs to confirm the causal impact of traditional games on reducing screen dependency.

In cross-cultural terms, findings from Indonesia, Spain, and Malaysia consistently highlight traditional games as culturally embedded tools for promoting movement and socialization. Conversely, research in technologically advanced or urbanized contexts (e.g., Canada, Lithuania) suggests that children are less familiar with these games, requiring greater adaptation or integration into formal curricula. This cross-contextual difference underscores the importance of considering cultural relevance when implementing traditional games as screen-time reduction strategies.

Effects of Physical Activities to Reduce Screen Time

The use of gadgets has many benefits in daily life, but Excessive gadget use negatively affects children's attention, emotional regulation, like to be alone, behave aggressively, lose creativity, and are at risk of cyberbullying, and physical health (Firmansyah et al., 2023; Fitriahadi dan Hanna Tyastiti., 2020; John et al., 2021; Nikooharf Salehi et al., 2025).

To overcome gadget addiction, one effective solution is Engaging in structured physical activities, particularly game-based and traditional forms to encourage children to engage in fun physical activities. These activities not only provide entertainment but also support children's growth and development. Interacting directly with friends through physical activity can help reduce dependence on gadgets. Based on an analysis of 23 articles, it was found that the physical activities most often applied in school learning include big ball games (soccer, basketball, volleyball, and handball), gymnastics, and athletic activities such as running, walking, and jumping.

Most quantitative studies reviewed (approximately 61%) show that increased physical activity correlates with reduced screen time, improved motor coordination, and greater social connectedness. For instance, Anggita et al. (2023) found that children involved in regular physical activities demonstrated lower screen dependency compared to those in unstructured play conditions.

However, the evidence base varies by age group. Preschool and primary students show the strongest behavioral improvement, while results for adolescents are less consistent—likely due to differing social motivations and technological access. This finding indicates that age-sensitive interventions are essential: while younger children benefit most from traditional games, older students may require hybrid approaches combining digital gamification and physical play.

Culturally, physical activity interventions in Southeast Asia and Latin America demonstrate greater community involvement compared to Western countries, where interventions often focus on individual motivation. Such distinctions suggest that integrating cultural and social dimensions into physical education may enhance effectiveness and sustainability.



The Challenge of Implementing Traditional Games and Physical Activity in Reducing Screen Time

Despite positive findings, implementing traditional games and physical activities to reduce screen time presents several challenges. First, interest among children and adolescents in traditional games is declining due to digital entertainment trends (Kristina et al., 2025). Limited space, lack of facilities, and insufficient teacher training also hinder the integration of traditional games into school programs (Harpina, 2025).

In addition to facility factors, another challenge faced is how teachers can manage and maintain student interest in traditional game-based physical activities. In sports learning, teachers have their own challenges in controlling children and maintaining their motivation and enthusiasm during the learning process (Nugraha et al., 2022). Therefore, the role of educators is very important in creating a fun atmosphere so that children are more interested in participating in traditional games than spending time with gadgets.

From an ethical standpoint, reducing screen time should not equate to total restriction of technology use. Instead, it should be combined with digital literacy education to foster balanced habits. Parents and teachers play an essential role in guiding children to use technology responsibly while staying physically active (Nwankwo et al., 2019; Masfufah & Darmawan, 2023).

Despite the promising potential of traditional games, several limitations must be acknowledged. First, the effectiveness of these interventions may vary depending on age, cultural background, and parental attitudes toward play. In urban settings, for example, limited space and safety concerns may hinder opportunities for outdoor play.

Strengths and Limitations of the Current Evidence

The reviewed studies collectively demonstrate strong and consistent evidence that traditional games and structured physical activities can effectively reduce children's screen time while promoting social interaction, motor development, and emotional well-being. These interventions are particularly valuable because they are culturally adaptable, low-cost, and feasible to implement in both school and community settings. The integration of traditional play into educational contexts not only supports physical health but also helps preserve local cultural heritage and strengthens intergenerational connections. Furthermore, the consistency of positive findings across diverse cultural settings—particularly in Southeast Asia and parts of Europe—suggests that the underlying mechanisms linking physical engagement and screen reduction are broadly applicable.

Despite these notable strengths, the current body of research still presents several limitations that warrant consideration. Many studies rely on small or region-specific samples and employ short-term interventions, making it difficult to generalize results or assess their long-term impact. The frequent use of self-reported data introduces potential bias, while the lack of longitudinal designs limits understanding of sustainability over time. Additionally, most available research originates from Asian and European contexts, with limited representation from African or Middle Eastern countries, which restricts global comparability. Another limitation concerns age-related focus—most studies emphasize preschool and primary education, whereas adolescent populations remain underexplored. Finally, variation in methodological rigor, such as inconsistent measures of screen time or activity intensity, further complicates the synthesis of findings.

To strengthen future research, it is essential to conduct longitudinal and cross-cultural investigations that employ standardized measurement instruments and robust experimental designs. Expanding research to include a wider range of cultural and developmental contexts will provide a more comprehensive understanding of how traditional games and physical activity interventions can sustainably mitigate the negative effects of excessive screen exposure.

Conclusions

This systematic review highlights that traditional games and physical activity are effective in reducing children's screen time by encouraging movement, social interaction, and emotional well-being, particularly in primary education. These games offer a culturally rooted, low-cost, and engaging alternative to digital entertainment that supports physical and socio-cognitive development.

Integrating traditional games into school curricula and community programs, with support from teachers and parents, can be a practical strategy to address sedentary lifestyles.

However, this review has several limitations, including its reliance on Scopus-indexed studies, small sample size (23 studies), and variation in design and outcome measures, which limit generalizability.

Future research should utilize longitudinal and cross-cultural designs to compare the effectiveness of traditional versus digital-based interventions, while exploring contextual and demographic factors that influence outcomes.

Thus, revitalizing traditional games is a culturally meaningful and sustainable approach to promoting healthier and more balanced screen use among children.

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