Physical Activity in Children
ISSN: 2783-5391

Original Article

Association Between Parental Attitudes Toward Physical Education and Children's Physical Activity Participation: A Comparison of In-School and Out-of-School Contexts

Lida Moradi *

Associate Professor, Department of Sport Physiology North Tehran, Branch, Islamic Azad University, Tehran, Iran.

*Corresponding Author: Lida Moradi, Associate Professor, Department of Sport Physiology North Tehran, Branch, Islamic Azad University, Tehran, Iran. Email: Moradi.lida@iau.ac.ir

Received: 27 September, 2025; **Revised:** 07 December, 2025; **Accepted:** 12 December, 2025; **Published**: 26 December, 2025.

Abstract

Introduction: Research has acknowledged the significance of parental attitudes toward physical education (PE); however, their impact on children's participation in physical activity (PA), both within and outside of school settings, has been explored only sporadically.
Objective: The purpose of this study was to explore the association between parental attitudes toward PE and PA participation in in-school and out-of-school contexts.
Methods: This study utilized a comparative-correlational design, focusing on a sample of 239 male children aged between 10 and 13 years. The Physical Education Activity Attitude Scale was employed to evaluate the attitudes of parents towards PE. Accelerometer device was used for measuring PA. Regression analysis was conducted for data analysis.
Results: The children engaged in moderate-to-vigorous physical activity (PA) for an average of 19.57 minutes during school hours, while their overall daily PA averaged 41.04 minutes. Additionally, the results indicate a strong positive correlation between parental attitudes toward PE with in-school PA (β=0.386, p<0.001), out-of-school PA (β=0.368, p<0.001), and total PA (β=0.221, p<0.001).
Conclusion: These results suggest that when parents exhibit a supportive and positive attitude towards PE, it significantly enhances PA levels of their children, both during school hours and in extracurricular settings. These findings suggest that encouraging parents to model positive attitudes and actively support their children's PA may be one of the most effective strategies for increasing children's overall participation in PA.

Keywords: Schools, Physical Education, Exercise, Child, Parents

How to Cite: Moradi L. Association Between Parental Attitudes Toward Physical Education and Children's Physical Activity Participation: A Comparison of In-School and Out-of-School Contexts. Phys. Act. Child. 2025;2(2):15-21. 10.22034/pach.2025.549570.1069

1. Introduction

Regular physical activity (PA) is linked to enhanced physical and mental health throughout an individual's life span (1). In children, engaging in PA correlates with reduced levels of various risk factors, including lower cholesterol and blood lipid levels, healthier blood pressure, and decreased body fat (2). Notably, these risk factors tend to be more pronounced among children from lower socioeconomic backgrounds (3). Furthermore, PA contributes positively to the overall well-being, self-esteem, and academic success of young individuals (4). Importantly, the habits formed during childhood often persist into adulthood; children who are more physically active are more likely to continue participating in a greater variety and volume of PA as they grow older (5). This continuity underscores the significance of promoting PA from an early age to foster lifelong health benefits.

The World Health Organization (WHO) advises that youth aged 5 to 17 years should engage in an average of 60 minutes of moderate to vigorous PA (MVPA) each day while also minimizing sedentary behavior (6). Despite this guidance, surveillance data reveal that a significant number of young individuals fail to meet these recommended activity levels. This situation is concerning, especially given the high rates of physical inactivity that often continue into adulthood (7). In response to this challenge, the WHO Global Action Plan on Physical Activity aims for a 15% relative reduction in global physical inactivity by the year 2030 (8). To successfully reach this objective, it is essential to gather robust evidence regarding activity patterns in childhood, the evolution of these behaviors as individuals age, and the identification of specific population sub-groups that may benefit from focused interventions. Such comprehensive data will be crucial for shaping effective local and national policies aimed at promoting PA, as well as for designing customized behavior change strategies that address the unique needs of different communities.

Schools play a crucial role in addressing this issue, as they are expected to actively contribute to the maintenance of health, the development of both physical and mental well-being, and the promotion of healthy lifestyles among youth (9). The extent to which schools can facilitate youth in meeting daily PA recommendations largely hinges on the educational framework and available resources within each

country (10). Given that millions of young individuals spend a significant portion of their waking hours in educational institutions, schools possess a unique opportunity to promote PA (11). Nevertheless, sedentary behaviors remain prevalent in the school environment, often overshadowing opportunities for movement (12). The American Heart Association has established a guideline suggesting that youth engage in at least 30 minutes of MVPA during school hours, specifically during the physical education (PE) (13). However, research assessing adherence to this guideline has yielded inconsistent findings. This discrepancy may be attributed to the fact that the recommendation specifies a fixed duration of MVPA, while the length of school PE varies significantly across different countries.

PE occupies a unique and beneficial role in fostering the advantages of PA, particularly as it engages a young, diverse, and attentive audience (14). Through PE, students are introduced to a wide range of PA, and these formative experiences can significantly influence their future engagement in PA during their free time (15). A central objective of PE is to equip young individuals with the essential motor skills, knowledge, and confidence necessary to make informed choices about participating in health-promoting PA outside of the school environment (16). However, there remains a notable gap in research regarding the strategies that PE teachers and programs can employ to effectively encourage students to maintain regular participation in PA beyond the confines of the classroom.

Parental attitudes toward their children's education, particularly in the realm of PE, may play a significant role in influencing children's participation in PA (17). Research indicates that a substantial majority, over 90% of parents, recognize the importance and relevance of PE for their children's future, advocating for its inclusion in school curricula (18,19). A study that explored parental perspectives on PE from a multicultural standpoint corroborated these findings, revealing a consensus among respondents that PE should be an integral part of children's educational experiences (20). Parents expressed a desire for the curriculum to prioritize physical fitness while also fostering children's confidence and self-esteem through opportunities for teamwork, cooperation, and a sense of belonging (21,22). Furthermore, the evidence suggests that when parents engage more actively with teachers and school administrators, and when stronger connections are forged between parents and educational personnel, parental attitudes toward the quality of their children's education tend to improve significantly (23,24). This highlights the critical role that parental involvement plays in shaping educational outcomes, particularly in PE.

Despite the recognized significance of parental attitudes towards PE, their influence on students' participation in PA both inside and outside of school has been infrequently examined. Given the critical role that regular PA plays in promoting the physical and mental well-being of children, both in the present and for their future, it is essential to understand the factors that encourage such participation. Parents are pivotal in shaping health-oriented behaviors in their children, making their perspectives on PE particularly relevant. This study was designed to explore the relationship between parental attitudes towards PE and children's engagement in PA within and beyond the school environment. Moreover, although many studies highlight the benefits of PA and the role of the home environment, surprisingly little empirical work has examined how parental attitudes toward PE specifically shape children's PA participation across different contexts. In particular, the distinct influences of parental attitudes on in-school versus out-of-school activity remain largely unexplored. By investigating this association, the research aims to shed light on how parental perceptions can impact children's active lifestyles, ultimately contributing to their overall health and development. Ultimately, the purpose of this study was to explore the association between parental attitudes toward PE and children's PA participation in in-school and out-of-school contexts.

2. Methods

2.1. Design and Participants

This study utilized a comparative-correlational design, focusing on a sample of 239 male children aged between 10 and 13 years. Participants were recruited from various primary schools, with strict inclusion criteria that mandated the absence of any physical or mental health issues, as well as the non-use of special medications at the time of the study. Individuals who did not meet these requirements or who failed to complete the questionnaire were excluded from the analysis. A priori power analysis using G*Power 3.1, with a medium effect size (f^2 = .15), an alpha level of .05, a desired power of .80, and three predictors indicated a minimum required sample size of 77 participants. The final sample of 239 participants therefore exceeded the recommended minimum and provided sufficient statistical power for the planned analyses. In addition, it should be noted that participants were recruited from multiple primary schools using a purposive sampling strategy, and while efforts were made to include schools from diverse geographic and socioeconomic backgrounds, potential selection biases may exist due to non-random participation and voluntary consent. The written consent was obtained from all participants and their guardians, thereby upholding the ethical standards necessary for conducting research involving minors.

2.2. Measurements

2.2.1. Parental Attitude Toward Physical Education

The Physical Education Activity Attitude Scale (25) was employed to evaluate the attitudes of parents towards PE. This tool was specifically crafted to investigate perceptions of PA within PE. The scale comprises 20 statements categorized into three theoretical constructs: general attitude, PE attitude, and scientific basis attitude. For the purposes of this study, the focus was on the PE attitude section, which includes six items rated on a 5-point Likert scale, where responses range from strongly agree (5) to strongly disagree (1), with a neutral option of don't know (3). The scoring system allows for a maximum possible score of 30 points and a minimum of 6 points, indicating that higher scores reflect a more favorable parental attitude towards PE. The reliability of the scale in this study is affirmed by a Cronbach's alpha coefficient of 0.95, suggesting a high level of internal consistency among the items.

2.2.2. Physical Activity

PA was evaluated using an accelerometer, which children were instructed to wear on their right thigh for a duration of seven days, only removing it for showering, swimming, or sleeping. To promote adherence and ensure correct usage, consistent communication was facilitated through social media platforms. The accelerometer captures various intensities of PA, including light, moderate, and vigorous PA. This study concentrated on MVPA index as a means to evaluate overall PA levels. After the monitoring period concluded, the collected data from the accelerometer were extracted, processed, and analyzed using specialized software. In this study, the duration of time that children utilized accelerometers during school hours was distinctly separated from the time spent using them outside of school. This differentiation was crucial in order to accurately assess and quantify the levels of PA exhibited by the children in both contexts. By isolating these two periods, the research aimed to provide a clearer understanding of how children's engagement in PA varies between the structured environment of school and the more unstructured settings outside of it.

2.3. Statistical Analysis

In this study, descriptive statistics, including the mean and standard deviation (SD), were utilized to summarize the key variables under investigation. To evaluate the normality of the data distribution, the Kolmogorov-Smirnov test was applied, resulting in p-values that exceeded 0.05, indicating that the data did not deviate significantly from a normal distribution. Furthermore, to examine the relationships among the research variables, both the Pearson correlation test and regression analysis were conducted. Prior to conducting parametric tests, assumptions of linearity, normality, and homoscedasticity were examined and met; multicollinearity among predictors was assessed using variance inflation factors (VIF), and model fit was evaluated through R^2 and adjusted R^2 values to ensure the robustness of the regression analyses. To compare levels of PA between children engaged in school-based PA and those participating in out-of-school PA, an independent t-test was employed. In addition, to assess PA levels of children in this study against international guidelines, a one-sample t-test was conducted. The level for statistical significance was established at $P < 0.05$.

3. Results

The demographic assessment indicated that the mean age of the children participating in the study was 11.23 years, accompanied by a SD of 0.58 years, suggesting a relatively homogeneous age distribution among the subjects. In terms of physical health, the participants exhibited a body mass index (BMI) that fell within a normal and healthy range, with an average of 18.69 and a SD of 1.63, reflecting appropriate weight status for their age group. Additionally, Table 1 provides a comprehensive overview of the means and SDs concerning parental attitudes toward PE, as well as the levels of PA both within and outside of school settings. The analysis of skewness and kurtosis for all variables measured yielded values ranging from -2 to +2, which supports the conclusion that the data conforms to the principles of normal distribution, thereby reinforcing the reliability of the findings.

Table 1. Description of Research Variables.

	Mean	SD	Skewness	Kurtosis
Parental Attitude	17.96	2.43	0.529	0.676
In-School Physical Activity	19.57	3.69	0.447	0.769
Out-School Physical Activity	21.47	4.94	0.128	0.227
Total Physical Activity	41.04	6.73	0.352	0.408

In this research, PA levels of children were evaluated against established international health-related PA standards and guidelines. The study utilized the international recommendation that children should engage in a minimum of 30 minutes of MVPA during school hours. Additionally, it is advised that children accumulate at least 60 minutes of such activity throughout the day. Consequently, the research focused on comparing PA of students during school hours with the global benchmark of 30 minutes per day. As indicated in Table 1, the children in this study participated in MVPA for an average of 19.57 minutes during school. The findings from a one-sample t-test revealed a statistically significant difference between the in-school PA levels of the sample and the international standard ($t=5.638$, $p<0.001$). Furthermore, the overall daily PA of the children was assessed against the international guideline of at least 60 minutes of MVPA. According to Table 1 and Figure 1, the average daily PA recorded for the children in this study was 41.04 minutes. The results of the one-sample t-test again demonstrated a significant difference ($t=4.285$, $p<0.001$), indicating that the total PA levels of the children were significantly lower than the recommended international standards.

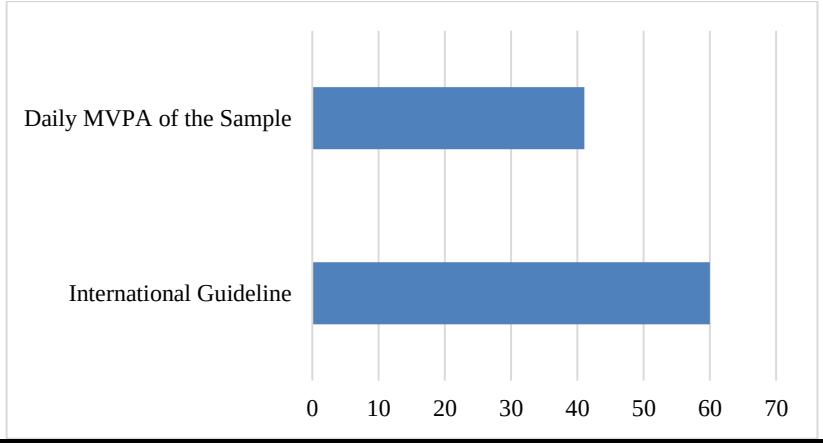

Figure 1. Comparison of Daily MVPA of the Sample with International Guideline.

The findings from the Pearson correlation analysis, as illustrated in Table 2, reveal notable positive correlations among the various research variables examined. In particular, a strong positive correlation is observed between parental attitude towards PE and in-school PA, with a correlation coefficient of r=0.589 and a significance level of p<0.001. Similarly, parental attitudes are positively associated with out-of-school PA (r=0.517, p<0.001) and total PA (r=0.638, p<0.001), indicating that favorable parental perceptions of PE are linked to increased PA levels in children both during and outside of school hours. Furthermore, the analysis also highlights a significant positive relationship between in-school PA and out-of-school PA, evidenced by a correlation coefficient of r=0.475 and a significance level of p<0.001. These results underscore the interconnectedness of parental influence and PA patterns among students, suggesting that enhancing parental attitude towards PE could play a crucial role in promoting overall PA.

Table 2. Pearson Correlation Matrix among the Research Variables.

	1	2	3	4
1. Parental Attitude	-			
2. In-School Physical Activity	r=0.589 p<0.001	-		
3. Out-School Physical Activity	r=0.517 p<0.001	r= 0.475 p< 0.001	-	
4. Total Physical Activity	r=0.638 p<0.001	r=0.364 p<0.001	r=0.310 p<0.001	-

The findings from the regression analysis, as illustrated in Table 3, reveal a significant positive correlation between parental attitudes toward PE and various forms of PA among students. Specifically, the analysis shows that higher levels of in-school PA are associated with a regression coefficient of β=0.386 (p<0.001), indicating a robust relationship. Similarly, out-of-school PA also demonstrates a strong positive association with a coefficient of β=0.368 (p<0.001). Furthermore, the overall total PA reflects a notable increase, with a regression coefficient of β=0.221 (p<0.001). These results suggest that when parents exhibit a supportive and positive attitude towards PE, it significantly enhances PA levels of their children, both during school hours and in extracurricular settings.

Table 3. Results of Regression Analysis.

Independent Variable	Dependent Variable	Partial Regression Coefficient (B)	Standardized Partial Regression Coefficient (β)	95% CI	p-Value
Parental Attitude	**In-School physical activity**	0.389	0.386	6.027-18.627	<0.001
	Out-School physical activity	0.372	0.368	0.192-0.476	<0.001
	Total physical activity	0.242	0.221	5.264-14.276	<0.001

4. Discussion

The impact of parental attitudes on children's involvement in PE has been acknowledged as significant; however, the extent of this influence on students' participation in PA, both within and outside the school environment, remains underexplored. This research aims to investigate the correlation between parental attitudes on PE and the engagement of children in PA across various contexts. Initial results indicate that the children involved in this study engaged in MVPA for an average of only 19.57 minutes during school hours, a figure that falls considerably short of the international benchmarks. Additionally, the average daily PA recorded for these children was 41.04 minutes, further highlighting that their overall activity levels are significantly below the recommended international standards. The results of this study, which are in line with those of previous studies (26-29), prompt a critical examination of the current approach to PE, particularly regarding its effectiveness in fostering a holistic educational experience for students. It becomes evident that the existing framework may fall short in promoting not only physical fitness but also the engagement in extracurricular PA that are essential for comprehensive student development. This limitation raises important questions about the pedagogical strategies employed

within PE programs and their ability to inspire students to pursue active lifestyles beyond the classroom. A reevaluation of these strategies is necessary to ensure that they align with the broader educational goals of nurturing well-rounded individuals who value PA as a vital component of their overall well-being.

The results of this research indicate a significant positive relationship between parental attitudes towards PE and the engagement of students in various types of PA. This includes PA conducted during school hours, those pursued outside of school, and the cumulative amount of PA overall. These findings align with previous research (17-19,30,31), reinforcing the notion that when parents adopt a supportive and encouraging stance regarding PE, it plays a crucial role in boosting their children's levels of PA. This enhancement is evident not only in structured school environments but also in extracurricular PA, highlighting the importance of parental influence in fostering a culture of physical fitness and active lifestyles among youth.

The current educational framework allocates a mere two hours per week to PE, often scheduled on the same day, which significantly limits the opportunities for children to engage in regular PA. In many instances, the actual physical engagement during these classes can be as minimal as twenty minutes, suggesting that the majority of children's PA occurs outside of school, primarily through extracurricular programs (18,19). This reliance on external PA is largely influenced by parental involvement; parents not only enroll their children in sports and pay associated fees but also play a crucial role in shaping their children's attitudes towards exercise. The impact of parental modeling is profound, as children often mirror PA levels of their parents, whether active or sedentary (17,20). Consequently, the interplay between school-based PE and parental influence underscores the need for a more robust approach to promoting PA among children, ensuring that they develop healthy habits that extend beyond the classroom.

This research into parental attitudes and behaviors during their children's participation in PE reveals a duality of interest and concern among parents. Notably, these attitudes and behaviors significantly influence the emotional responses of youth engaged in sports. Specifically, positive and supportive parental involvement has been associated with favorable emotional outcomes for young athletes (19,32). For instance, young athletes often report a heightened sense of enjoyment when they perceive their parents as satisfied and engaged, particularly when they do not feel excessive pressure from their mothers. This dynamic is evident in the experiences of young male and female basketball players, who attribute their enjoyment of the season to the absence of parental pressure. Furthermore, young skiers demonstrate a similar correlation, where their enthusiasm for the sport is closely tied to their perception of parental support and encouragement (17,18,33). Additionally, a positive relationship has been established between young athletes' perceptions of parental encouragement to participate in sports, the enjoyment they derive from these PA, and their overall self-esteem. This underscores the critical role that parental attitudes play in shaping not only the sporting experiences of children but also their emotional well-being and self-perception.

The study's cross-sectional design presents a significant limitation, as it only captures parental attitudes and children's PA behaviors at a single point in time, hindering the ability to establish causal relationships. Additionally, the sample size of 239 participants may not adequately represent the diversity of all families, as regional differences, socioeconomic status, and cultural beliefs about PA could influence the results, limiting generalizability. Moreover, the distinct contexts of in-school and out-of-school PA, shaped by various environmental factors like school resources and community access, were not controlled for, potentially affecting participation independently of parental attitudes. Lastly, by using the convenience sampling, it is possible that the families who opted to participate already prioritize PA, which could skew the findings towards more favorable attitudes and higher activity levels.

4.1. Conclusion

The data gathered from the parents surveyed in this study reveal a significant correlation between the involvement of school-age children in PA, both within and outside of school, and the attitudes of their parents towards PE. The results suggest that when parents hold a strong belief in the value of PE, their children are likely to recognize its importance as well, which may lead to increased participation in PE. Furthermore, if parents actively acknowledge the significance of PE, they are more inclined to support their children's learning experiences in this area and to engage in initiatives that promote their children's PA. This dynamic underscore the critical role that parental attitudes play in shaping children's perceptions and involvement in PE, highlighting the need for strategies that encourage positive parental engagement in this domain. These findings suggest that encouraging parents to model positive attitudes and actively support their children's PA may be one of the most effective strategies for increasing children's overall participation in PA.

Acknowledgments

The author is grateful to all participants who took part in this research.

Footnotes

Authors' Contribution: This study was carried out solely by the corresponding author.

Conflicts of Interest

Non to declare.

Data Availability: The data that support the findings of this study are openly available upon request from the corresponding author.

Ethical Approval: This research was carried out in compliance with the ethical principles set forth in the Declaration of Helsinki and received approval from the University Ethics Committee (Code: IR.IAU.TNB.REC.1403.057). Informed consent was obtained from both the participants and their parents.

Funding Support

This study received no grant.

Informed Consent: Informed written consent was

obtained from all participants

Supplementary information accompanies this paper at doi: 10.22034/pach.2025.549570.1069

ORCID iD

Lida Moradi https://orcid.org/0000-0002-4012-6199

References

1. Bravo-Vazquez A, Anarte-Lazo E, Gonzalez-Gerez JJ, Rodriguez-Blanco C, Bernal-Utrera C. Effects of Physical Exercise on the Physical and Mental Health of Family Caregivers: A Systematic Review. Healthcare (Basel). 2025;**13**(10):1196. [PubMed ID: 40428033]. [PubMed Central ID: PMC12111804] https://doi.org/10.3390/healthcare13101196
2. Nagata JM, Weinstein S, Alsamman S, Lee CM, Dooley EE, Ganson KT, Testa A, Gooding HC, Kiss O, Baker FC, Pettee Gabriel K. Association of physical activity and screen time with cardiovascular disease risk in the Adolescent Brain Cognitive Development Study. BMC Public Health. 2024;**24**(1):1346. [PubMed ID: 38762449]. [PubMed Central ID: PMC11102349] https://doi.org/10.1186/s12889-024-18790-6
3. Burki AA. Assessing the relative significance of key risk factors for child undernutrition in Punjab, Pakistan. BMC Public Health. 2025;**25**(1):1416. [PubMed ID: 40234871]. [PubMed Central ID: PMC11998319] https://doi.org/10.1186/s12889-025-22626-2
4. Dana A, Ranjbari S, Chaharbaghi Z, Ghorbani S. Association between Physical Activity and Motor Proficiency among Primary School Children. Int J School Health. 2023;**10**(3):128-135. https://doi.org/10.30476/intjsh.2023.98237.1295
5. Ziegeldorf A, Niermann C, Speer A, Streicher H, Wagner P, Wulff H. Changes of children's physical activity from 1st to 4th grade are related to parents' educational level and Family Health Climate: a longitudinal study with primary school-aged children. Front Sports Act Living. 2025;**7**:1537854. [PubMed ID: 40552347]. [PubMed Central ID: PMC12183056] https://doi.org/10.3389/fspor.2025.1537854
6. Bull FC, Al-Ansari SS, Biddle S, Borodulin K, Buman MP, Cardon G, Carty C, Chaput JP, Chastin S, Chou R, Dempsey PC, DiPietro L, Ekelund U, Firth J, Friedenreich CM, Garcia L, Gichu M, Jago R, Katzmarzyk PT, Lambert E, Leitzmann M, Milton K, Ortega FB, Ranasinghe C, Stamatakis E, Tiedemann A, Troiano RP, van der Ploeg HP, Wari V, Willumsen JF. World Health Organization 2020 guidelines on physical activity and sedentary behaviour. Br J Sports Med. 2020;**54**(24):1451-1462. [PubMed ID: 33239350]. [PubMed Central ID: PMC7719906] https://doi.org/10.1136/bjsports-2020-102955
7. Baniasadi T, Ranjbari S, Abedini A, Dana A, Ghorbani S. Investigation the Association of Internet Addiction with Mental Health and Physical Activity in Teenage Girls: The Mediating Role of Parental Attitude. Women Health Bull. 2022;**9**(4):243-250. https://doi.org/10.30476/whb.2022.96915.1197.
8. Strain T, Flaxman S, Guthold R, Semenova E, Cowan M, Riley LM, Bull FC, Stevens GA; Country Data Author Group. National, regional, and global trends in insufficient physical activity among adults from 2000 to 2022: a pooled analysis of 507 population-based surveys with 5·7 million participants. Lancet Glob Health. 2024;**12**(8):e1232-e1243. doi: 10.1016/S2214-109X(24)00150-5. Erratum in: Lancet Glob Health. 2025;13(2):e202. [PubMed ID: 38942042]. [PubMed Central ID: PMC11254784] https://doi.org/10.1016/s2214-109x(24)00150-5
9. Santos F, Sousa H, Gouveia ÉR, Lopes H, Peralta M, Martins J, Murawska-Ciałowicz E, Żurek G, Marques A. School-Based Family-Oriented Health Interventions to Promote Physical Activity in Children and Adolescents: A Systematic Review. Am J Health Promot. 2023;**37**(2):243-262. [PubMed ID: 36413351]. [PubMed Central ID: PMC9850376] https://doi.org/10.1177/08901171221113836
10. Khanbeiki A. The Effects of Mindfulness Training in the Physical Education on Intention to Physical Activity, Mental Health and Academic Performance among High-School Students. Phys Act Child. 2024;**1**(1):68-73. https://doi.org/10.61186/pach.2024.470015.1022.
11. Murphy MH, O'Kane SM, Carlin A, Lahart IM, Doherty LC, Jago R, McDermott G, Faulkner M, Gallagher AM. Effectiveness of the Walking in ScHools (WISH) Study, a peer-led walking intervention for adolescent girls: results of a cluster randomised controlled trial. Int J Behav Nutr Phys Act. 2024;**21**(1):19. [PubMed ID: 38374037]. [PubMed Central ID: PMC10877798] https://doi.org/10.1186/s12966-024-01563-0
12. Bandera-Campos FJ, Grao-Cruces A, Camiletti-Moirón D, Martín-Acosta F, Muñoz-González R, González-Pérez M, Ruiz-Hermosa A, Vaquero-Solís M, Padilla-Moledo C, Sánchez-Oliva D. Effectiveness of a multicomponent intervention to promote physical activity during the school day: rationale and methods of the MOVESCHOOL study. Front Public Health. 2025;**13**:1565914. [PubMed ID: 40144996]. [PubMed Central ID: PMC11936994] https://doi.org/10.3389/fpubh.2025.1565914
13. Eskandarnejad M, Alimohammadi T. Effects of an Educational Intervention based on the Theory of Planned Behavior on Physical Activity Behavior of Male Teenagers: An Accelerometer-Based Study. Phys Act Child. 2024;**1**(2):74-79. https://doi.org/10.61186/pach.2024.489767.1040
14. Carlin A, Doherty LC, O'Kane SM, Jago R, Lahart IM, McDermott G, Faulkner M, Gallagher AM, Murphy MH. A process evaluation of the walking in ScHools (WISH) study using the RE-AIM framework. BMC Public Health. 2025;**25**(1):844. [PubMed ID: 40033298]. [PubMed Central ID: PMC11877823] https://doi.org/10.1186/s12889-025-21434-y
15. Han X, Li H, Niu L. How does physical education influence university students' psychological health? An analysis from the dual perspectives of social support and exercise behavior. Front Psychol. 2025;**16**:1457165. [PubMed ID: 40040663]. [PubMed Central ID: PMC11877448] https://doi.org/10.3389/fpsyg.2025.1457165
16. Jung Y, Burson SL, Julien C, Bray DF, Castelli DM. Development of a School-Based Physical Activity Intervention Using an Integrated Approach: Project SMART. Front Psychol. 2021;**12**:648625. [PubMed ID: 34484025]. [PubMed Central ID: PMC8414413] https://doi.org/10.3389/fpsyg.2021.648625
17. Hosokawa R, Fujimoto M, Katsura T. Parental support for physical activity and children's physical activities: a cross-sectional study. BMC Sports Sci Med Rehabil. 2023;**15**(1):90. [PubMed ID: 37491297]. [PubMed Central ID: PMC10367251] https://doi.org/10.1186/s13102-023-00700-9
18. Sibuyi MM, Mathye D, Tshabalala MD, Mphahlele KM, Mshunqane N. Parental perspectives on support for learners with physical disabilities at special schools. Afr J Disabil. 2025;**14**:1640. [PubMed ID: 40937282]. [PubMed Central ID: PMC12421545] https://doi.org/10.4102/ajod.v14i0.1640
19. Liu X, Han H, Li Z, Huang S, Zhao Y, Xiao Q, Sun J. Barriers and facilitators to participation in physical activity for students with disabilities in an integrated school setting: a meta-synthesis of qualitative research evidence. Front Public Health. 2025;**13**:1496631. [PubMed ID: 40145000]. [PubMed Central ID: PMC11936882] https://doi.org/10.3389/fpubh.2025.1496631
20. Fleet M, Earley L. Parents' perceptions of secondary physical education. Int J Contemp Educ. 2021;**4**(2):43-57. https://doi.org/10.11114/ijce.v4i2.5350
21. Alcántara-Porcuna V, Sánchez-López M, Martínez-Vizcaíno V, Martínez-Andrés M, Ruiz-Hermosa A, Rodríguez-Martín B. Parents' Perceptions on Barriers and Facilitators of Physical Activity among Schoolchildren: A Qualitative Study. Int J Environ Res Public Health. 2021;**18**(6):3086. [PubMed ID: 33802746]. [PubMed Central ID: PMC8002392] https://doi.org/10.3390/ijerph18063086
22. Webster CA, McLoughlin G, Starrett A, Papa J, Erwin H, Reed JA, Carson RL, Burgeson C. Parents' Perceptions and Engagement Regarding School-Based Physical Activity Promotion. Am J Health Promot. 2021;**35**(8):1125-1128. [PubMed ID: 34047206]. https://doi.org/10.1177/08901171211020987
23. Long B, Chen S, Long Y. et al. The predictive relationship between parents' perceptions of physical activity and children's physical literacy. Sci Rep. 2025;**15**:24207. https://doi.org/10.1038/s41598-025-09369-1
24. Kwon EH, Block M, Healy S, Kim TE. Adapted Physical Education: The Perspective of Asian Parents. Int J Environ Res Public Health. 2021;**19**(1):91. [PubMed ID: 35010351]. [PubMed Central ID: PMC8751100] https://doi.org/10.3390/ijerph19010091
25. Özer Ö, Uyhan O, Devrilmez E, Orhan İ, Bilgiç M, Uğurlu A, Tabak EY, Yüksel O, Şentürk A, Karakullukçu A, Eler N, Özcan K, Akpınar S. The relationship between attitude toward physical activity and weight gain in children and young adolescence. Front Pediatr. 2024;**12**:1300613. [PubMed ID: 38774299]. [PubMed Central ID: PMC11106473] https://doi.org/10.3389/fped.2024.1300613
26. Wong LS, Reilly JJ, McCrorie P, Harrington DM. Moderate-to-vigorous intensity physical activity during school hours in a representative sample of 10-11-year-olds in Scotland. J Sci Med Sport. 2023;**26**(2):120-124. [PubMed ID: 36369110]. doi: 10.1016/j.jsams.2022.10.014.
27. Brazendale K, Beets MW, Armstrong B, Weaver RG, Hunt ET, Pate RR, Brusseau TA, Bohnert AM, Olds T, Tassitano RM, Tenorio MCM, Garcia J, Andersen LB, Davey R, Hallal PC, Jago R, Kolle E, Kriemler S, Kristensen PL, Kwon S, Puder JJ, Salmon J, Sardinha LB, van Sluijs EMF; International Children's Accelerometry Database (ICAD) Collaborators. Children's moderate-to-vigorous physical activity on weekdays versus weekend days: a multi-country analysis. Int J Behav Nutr Phys Act. 2021;**18**(1):28. [PubMed ID: 33568183]. [PubMed Central ID: PMC7877033] https://doi.org/10.1186/s12966-021-01095-x
28. Mwakalebela FS, Minja EG, Mwalugelo YA, Killel E, Rajab RK, Mollel GJ, Mponzi W, Masanja H, Okumu FO, Lang C, Gerber M, Utzinger J, Long KZ, Kosia EM, Elisaria E, Finda MF. Association between physical activity, nutritional status and cognitive performance among school children in southern Tanzania. Front Public Health. 2025;**13**:1552215. [PubMed ID: 40556926]. [PubMed Central ID: PMC12185417] https://doi.org/10.3389/fpubh.2025.1552215

29. Hu D, Zhou S, Crowley-McHattan ZJ, Liu Z. A comparative study of the physical activity guidelines for children and adolescents from five countries and WHO. Front Public Health. 2024;**12**:1421843. [PubMed ID: 39071153]. [PubMed Central ID: PMC11272551] https://doi.org/10.3389/fpubh.2024.1421843
30. Chen W, Zhou B, Wang X, Li L. Research on the relationship between physical literacy and demographic variables and interpersonal support for physical exercise among adolescents in China. PLoS One. 2024;**19**(10):e0311793. [PubMed ID: 39466803]. [PubMed Central ID: PMC11516006] https://doi.org/10.1371/journal.pone.0311793
31. Xie S, Li N, Guo W. The impact of family endowment on adolescents' physical activity behavior. Front Public Health. 2025;**13**:1589515. [PubMed ID: 40535437]. [PubMed Central ID: PMC12174132] https://doi.org/10.3389/fpubh.2025.1589515
32. Gao Z, Chee CS, Norjali Wazir MRW, Wang J, Zheng X, Wang T. The role of parents in the motivation of young athletes: a systematic review. Front Psychol. 2024;**14**:1291711. [PubMed ID: 38259527]. [PubMed Central ID: PMC10800670] https://doi.org/10.3389/fpsyg.2023.1291711
33. Liu C, Zhao F, Nong S, Lin Z. Being a right parent: a narrative review of the theory and practice of parental involvement in sport parenting. Front Psychol. 2024;**15**:1412708. [PubMed ID: 38911961]. [PubMed Central ID: PMC11190379] https://doi.org/10.3389/fpsyg.2024.1412708