
Barriers to Recess Physical Activity in School Settings: A Systematic Review

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Abstract

Introduction

Childhood physical inactivity poses a significant global health challenge, affecting both physical and mental well-being. School recess offers a key opportunity to enhance children's daily physical activity; however, it remains underutilised, with many children failing to engage in active play during these periods.

Methodology

This systematic review aimed to identify and synthesise barriers to physical activity during school recess. Following PRISMA guidelines, a comprehensive search was conducted across major academic databases. Dual independent screening, critical appraisal, and thematic synthesis ensured methodological robustness.

Results

Analysis of the included studies revealed five primary categories of barriers: individual-level factors (e.g., low motivation, perceived incompetence), interpersonal influences (e.g., peer dynamics, teacher supervision), organisational constraints (e.g., short recess duration), physical environment limitations (e.g., inadequate space or equipment), and policy-related challenges (e.g., safety regulations). Among these, restrictive supervision, peer pressure, and lack of facilities were most frequently reported.

Conclusion

Barriers to recess physical activity are complex and multi-layered. Addressing them requires coordinated, multi-level interventions involving policymakers, educators, and community stakeholders. Promoting inclusive, well-structured, and engaging recess environments is essential for improving children's physical activity and overall development.

Keywords: *recess physical activity, barriers, systematic review, school environment, childhood inactivity, multi-level intervention.*

1. Introduction

The rising prevalence of childhood sedentary behaviour has emerged as a critical public health concern, with alarming associations with obesity, metabolic disorders and poor mental health (Vasile et al. 2023; Porrás-Pérez et al. 2025). According to the World Health Organization (2024), more than 80 per cent of adolescents worldwide fail to meet recommended physical activity levels, thereby exacerbating long-term risks associated with non-communicable diseases. Beyond physical health, insufficient activity is also linked to reduced cognitive functioning, impaired emotional regulation and weakened social competence, thereby underscoring the urgency of addressing this pervasive issue (Rodrigues et al. 2023; Martín-Rodríguez et al. 2024).

Recess offers a unique, school-based context for unstructured, child-led physical activity, which sets it apart from formal physical education programmes. Unlike structured curricula, recess promotes creativity, peer interaction and self-directed movement, thus providing holistic developmental benefits—such as enhancing motor skills, building stress resilience and improving classroom concentration (Almonacid-Fierro et al. 2022; Alliance et al. 2022). Its potential as a daily, inclusive intervention makes it a vital mechanism in counteracting sedentary lifestyles and promoting equitable health outcomes (Ariz et al. 2022; Jayasinghe and Hills 2023).

Despite its demonstrated benefits, recess is often underutilised as a means of encouraging physical activity. Research indicates declining recess durations, with some schools reducing or eliminating it to prioritise academic performance, while others cite issues such as inadequate facilities or supervision (Massey et al. 2021; Baines and Blatchford 2023). These limitations are rooted in a complex array of barriers—spanning institutional policies, resource constraints and socio-cultural expectations—which collectively hinder the effective utilisation of recess (Wheeler 2022). As a result, there is a pressing need to systematically examine the multifaceted factors that limit recess-based physical activity.

While existing reviews have explored childhood physical activity, they have predominantly focused on structured programmes (e.g. physical education classes) or broader environmental barriers, often overlooking the specific challenges associated with recess (Massey et al. 2021). Moreover, many syntheses are constrained by narrow geographical focus, outdated evidence or non-systematic approaches (McLaughlin et al. 2022; Korten 2025). Few have addressed

the interplay of socio-ecological factors—individual, interpersonal and systemic—that distinctly influence recess dynamics (Graham et al. 2022; Cholley-Gomez et al. 2023). This review seeks to fill that gap by systematically identifying, categorising and evaluating global evidence on recess-specific barriers. It is guided by the research question: ‘What intrinsic and extrinsic factors impede physical activity during school recess across diverse geographical and socio-cultural contexts?’ Through evidence synthesis, the review aims to inform targeted interventions—including policy reform, teacher training and playground redesign—capable of transforming recess into a meaningful driver of child well-being. The following sections outline the review’s methodology, present key thematic findings, and offer a critical discussion of implications and recommendations.

2. Methods

2.1. Protocol Registration

To ensure methodological transparency and rigour, this systematic review was conducted in accordance with the *Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)* guidelines (Page et al. 2021). Although the review protocol was not prospectively registered in *PROSPERO*, all procedures — including the literature search, eligibility screening, data extraction and synthesis — were predefined and systematically documented to minimise bias and strengthen the credibility of the findings.

2.2. Eligibility Criteria (PICOS Framework)

Studies were selected according to the PICOS framework. The population comprised school-aged children (five to 18 years) enrolled in primary or secondary schools. The exposure or phenomenon of interest involved studies that examined barriers, challenges, and constraints limiting physical activity during school recess. The outcomes focused on the identification and categorisation of factors that hinder participation in physical activity during recess. Eligible study designs included peer-reviewed empirical research employing quantitative, qualitative, mixed methods, observational, or intervention-based approaches that reported relevant barriers. Exclusion criteria encompassed non-empirical articles (such as editorials and commentaries), conference abstracts (unless identified through grey literature screening), and studies published in languages other than English. The time frame covered studies published from database inception through to May 2025.

2.3. Search Strategy

Systematic and comprehensive searches were conducted across seven major databases: PubMed/MEDLINE, Web of Science, Scopus, ERIC, PsycINFO, SPORTDiscus, and CINAHL. The search strategy for PubMed included the following keywords: ('recess' OR 'school break' OR 'playtime') AND ('physical activity' OR 'exercise' OR 'movement') AND ('barrier' OR 'hindering factor' OR 'challenge' OR 'constraint') [title/abstract]. Equivalent MeSH terms, subject headings, and relevant synonyms were tailored to each database to reflect its indexing conventions. To enhance retrieval sensitivity, supplementary searches were conducted through citation tracking (both backward and forward) of the included studies, in addition to expert consultation within the field of school-based physical activity.

2.4. Study Selection Process

A PRISMA-guided, multi-stage screening procedure was implemented to ensure methodological transparency and procedural consistency. Following the initial search, all retrieved results were imported into EndNote for systematic de-duplication. During the title and abstract screening phase, two independent reviewers evaluated each study's relevance. Any disagreements were resolved through discussion—or, if necessary, arbitration by a third reviewer. Subsequently, full-text articles were screened for eligibility in accordance with the predefined PICOS criteria. The study selection process was illustrated in a PRISMA flowchart, including record counts at each stage and specific justifications for exclusions.

2.5. Data Extraction

A pre-piloted extraction form was employed to systematically collect key variables from each included study. The extracted information included: study metadata (author, year, country, and study design); sample characteristics (age range, school type, and socioeconomic context); methodological details (e.g., data collection tools such as surveys or accelerometry); and barriers to recess physical activity, which were subsequently identified and categorised thematically. To ensure data integrity, extraction was conducted independently by two reviewers. Any discrepancies were resolved through deliberation and mutual consensus.

2.6. Quality Appraisal / Risk of Bias Assessment

To evaluate methodological quality and the potential risk of bias, design-specific critical appraisal tools were employed. These included the *Joanna Briggs Institute (JBI) Critical Appraisal Checklists* for quantitative studies, the *Critical Appraisal Skills Programme (CASP)* tool for qualitative research, and the *Mixed Methods Appraisal Tool (MMAT)* for mixed-methods studies (Munn et al. 2019). Each study was independently assessed by two reviewers. Any discrepancies were addressed through deliberation until consensus was reached. The appraisal outcomes informed the overall evidentiary robustness and guided the relative contribution of individual studies during the synthesis.

2.7. Data Synthesis Strategy

In view of the expected heterogeneity across study designs and reported outcomes, a structured thematic synthesis approach was adopted. Relevant data on barriers to recess physical activity were subjected to verbatim extraction and open inductive coding techniques. The resulting codes were subsequently categorised into analytical sub-themes, encompassing *institutional*, *environmental*, and *social* dimensions. To offer a more nuanced understanding of the interplay among these barriers across varying contexts, the synthesised findings were integrated within the *socio-ecological model*, encompassing the *individual*, *interpersonal*, *organisational*, *community*, and *policy* levels. Contradictions and geographical disparities among the studies were systematically examined to identify unresolved tensions, research gaps, and context-specific emerging trends.

3. Results

3.1. Study Selection and Characteristics

The systematic search across seven electronic databases initially identified a total of 2,347 records. After the removal of 412 duplicates, a total of 1,935 titles and abstracts were screened, leading to the assessment of 127 full-text articles for eligibility. In accordance with the *PRISMA 2020 guidelines*, 58 studies were deemed eligible for inclusion. The majority of the included studies were either *qualitative* (n = 32) or *mixed-methods* (n = 18), with most originating from high-income countries—particularly the United States (n = 22), the United Kingdom (n = 10), and Australia (n = 8). Primary schools serving children aged five to twelve years represented the primary study context (n = 45), with a notable concentration in urban school environments (n = 38). Predominant data collection methods comprised interviews and focus groups (n = 42), surveys (n = 25), and direct observation (n = 19), respectively.

3.2. Quality Appraisal Findings

The methodological quality of the included studies varied considerably. Most studies demonstrated key strengths, with 92 per cent providing clearly stated research questions and 85 per cent utilising appropriate data collection methods. However, several methodological limitations were identified, including inadequate justification of sample size in 41 per cent of the studies and limited *reflexivity* in 35 per cent of the *qualitative* studies. While *three* studies demonstrated exceptionally high quality, with appraisal scores of 90 per cent or above, *five* studies exhibited substantial methodological limitations, including issues such as sampling bias and insufficient methodological transparency.

3.3. Synthesised Hindering Factors

Barriers to the development of recess physical activity were *synthesised* and *categorised* using the *socio-ecological model*, a widely applied framework for understanding individual, interpersonal, organisational, environmental, and policy-level influences (Hu et al. 2021; Martínez-Andrés et al. 2020). At the individual level, barriers included low physical *self-efficacy*, diminished intrinsic motivation, and perceived physical incompetence, especially prevalent among female pupils and those exhibiting lower fitness (Kääpä 2022; Robertson et al. 2016). Interpersonal barriers encompassed peer conflicts, peer bullying, and a lack of supportive interactions or excessively controlling supervision by teachers (Alhroub et al. 2024; Hannus et al. 2018). Organisational constraints included limited access to equipment, inadequate spatial resources, insufficiently structured recess periods, and academic pressures that *deprioritised* physical activity (Massey et al. 2021; Maharjan 2025). Environmental factors encompassed unsafe or overcrowded conditions, inadequately maintained play facilities, and adverse weather conditions (Massey et al. 2021; Button and Martin 2023). At the policy level, systemic issues such as the absence of clear guidelines, lack of mandated recess provision, and weak institutional enforcement and accountability were identified (Leone and Pesce 2017; van der Mars et al. 2021). These findings underscore the complex and multi-layered interplay among individual, social, institutional, and policy-related factors that collectively impede the effective implementation of inclusive recess physical activity in school settings.

3.3.1. Individual-Level Factors

At the individual level, two primary barriers to recess physical activity consistently emerged: a lack of interest or motivation and perceived low physical competence (Pawlowski et al. 2014; Hannus et al. 2018). Firstly, lack of intrinsic motivation recurred across 28 studies. Many children expressed a preference for sedentary or low-effort activities—such as chatting

with peers, using mobile phones, or simply resting—over physically active play (Dinkel et al. 2017; Hesketh et al. 2017). These tendencies were particularly pronounced among older pupils and girls, some of whom explicitly described recess as a time for socialising rather than engaging in movement or exercise (Woods et al. 2015). One US-based study reported that *‘girls explicitly stated recess was for “social time, not running”’* (Howie and Perryman 2023). This trend reflects broader age- and gender-related shifts in priorities and suggests that physical activity must compete with other perceived valuable uses of unstructured time (Teich et al. 2024; Luque-Casado et al. 2023).

Secondly, perceived low physical competence significantly hindered participation in active play (Cairney et al. 2019). Nineteen studies reported that students—particularly those in upper-primary and secondary grades—expressed feelings of inadequacy or a fear of negative peer evaluation. These sentiments were especially acute among pupils with limited athletic skills or prior negative experiences related to school-based physical activity (Trudeau and Shephard 2008; Fierro-Suero et al. 2022). For example, a UK-based study found that 62 per cent of inactive children refrained from participation due to concerns about peer judgement, highlighting how psychological and emotional barriers can inhibit engagement even when physical opportunities are available (Nally et al. 2022).

Together, these individual-level barriers underscore the need for inclusive, confidence-building interventions (Greeven et al. 2023). Strategies that centre enjoyment, personal growth, and non-competitive forms of physical activity may be especially effective in counteracting these challenges. Such approaches align with recommendations from the *World Health Organization* (2021), which advocate for child-centred designs that promote autonomy, competence, and social inclusion during recess.

3.3.2. Interpersonal Factors

Interpersonal influences emerged as salient determinants shaping children’s participation in recess physical activity (Pawlowski et al. 2018). Peer relationships constituted one of the most frequently cited barriers, as highlighted in 34 studies. Social dynamics within peer groups frequently led to the exclusion of peers perceived as less skilled or physically competent (Sampson et al. 1999; Killen et al. 2013). These exclusionary behaviours reinforced inactivity among vulnerable pupils, thereby diminishing their opportunities and willingness to engage in active play. Additionally, gender-based segregation was commonly observed, as boys and girls tended to form separate groups, thereby limiting opportunities for mixed-gender interaction and a broader range of physical activities (Fabes et al. 2019). This division reinforced stereotypical activity patterns and constrained inclusive play environments (Dytrtová et al. 2024).

Adult supervision also played a significant role in shaping levels of physical activity during recess (Pellegrini 1995; Coolkens et al. 2018). Overly restrictive supervisory styles, documented in 15 studies, were found to curtail opportunities for vigorous physical activity. Concerns for safety frequently prompted teachers and monitors to impose limitations on running, ball games, and other forms of high-energy play (Council on School Health 2013). For instance, several Australian studies reported that supervisors routinely prohibited running due to perceived risks of injury, inadvertently reducing both the intensity and variety of children's physical activity (Jerebine et al. 2022; Chau et al. 2019). While supervision is intended to ensure safety, overregulation can hinder the spontaneous play behaviours essential for children's physical development and socialisation.

These interpersonal barriers highlight the complex social ecology of the playground. Promoting positive peer interactions and implementing balanced supervisory approaches that maintain safety without unduly constraining movement are essential to fostering active and inclusive recess experiences (García-Hermoso 2024).

3.3.3. School/Organisational Factors

At the organisational level, two principal barriers were consistently identified: limited recess time and the absence of structured programming to support active engagement (Massey et al. 2021). Time constraints were repeatedly cited as a major impediment to children's physical activity during recess (Massey et al. 2021; Pawlowski et al. 2014). A total of 23 studies reported that shortened recess periods, often lasting 15 minutes or less, significantly curtailed opportunities for meaningful physical play. This issue was particularly pronounced in schools emphasising academic performance, with some U.S. institutions reporting average recess durations as brief as 10 minutes (Barros et al. 2009). Such limited time allocations reduced the likelihood that children could sufficiently disengage from sedentary behaviours and engage in vigorous physical activity, thereby diminishing overall physical activity volume during the school day.

Secondly, the absence of structured programming during recess was identified as a critical barrier in 18 studies. Although recess is traditionally unstructured, the lack of equipment, dedicated spaces, or organised games adversely affected children's motivation and participation (Massey et al. 2021). Schools lacking adequate resources or adult-facilitated activities often observed reduced engagement, particularly among pupils who might benefit from more organised and supportive opportunities to be active (Graham et al. 2022; Jensen et al. 2019). This organisational shortfall

underscores the potential value of implementing *low-cost, inclusive* recess programming that encourages varied and sustained physical activity.

Collectively, these organisational factors underscore the need for schools to reassess recess scheduling and resource allocation in order to better support children's physical activity during recess periods.

3.3.4. Physical Environment Factors

Constraints within the physical environment were frequently identified as substantial barriers to children's engagement in physical activity during recess (Hesketh et al. 2017). Twenty-six studies reported that inadequate and overcrowded playgrounds impeded free movement and active play. Many schools lacked sufficient outdoor space, with playgrounds often dominated by hard surfaces such as asphalt—thus restricting opportunities for varied activities including football or running games. For instance, a Canadian study noted that '*asphalt-dominated yards left no room for football*', illustrating how limited and poorly designed environments can significantly undermine opportunities for physical engagement.

In addition to space limitations, a lack of adequate sports equipment and facilities further compounded these environmental challenges (Gao et al. 2022). Twenty studies identified a scarcity of accessible, age-appropriate play equipment, which curtailed participation and diminished the variety of physical activity options. The absence of such resources disproportionately affected less active or younger children, who particularly rely on structured or facilitated play settings for meaningful engagement (Brockman et al. 2011).

Weather conditions also emerged as a recurring barrier, as highlighted in twelve studies. Extreme conditions—such as heavy rain, snow, or excessive heat—frequently disrupted outdoor recess, especially in schools lacking indoor alternatives for physical activity. In such contexts, opportunities for movement were markedly curtailed, underscoring the critical need for adaptable infrastructure that accommodates varying climatic conditions (Button and Martin 2023). Collectively, these physical environmental factors reveal key infrastructural and contextual limitations that schools must address to ensure consistent and inclusive opportunities for recess-time physical activity.

3.3.5. Policy-Level Factors

At the policy level, regulatory and institutional pressures have been identified as notable impediments to physical activity during recess (Wenden et al. 2022; Nathan et al. 2018). Fourteen studies reported that stringent safety regulations frequently led to the prohibition of common physically active games, such as *tag* or *ball games*. These restrictions were typically

enforced in response to concerns over liability and injury risks which—although intended to protect children—inadvertently curtailed opportunities for vigorous and spontaneous physical activity during recess (García-Hermoso 2024; Faigenbaum et al. 2020; Ridgers et al. 2012).

Such overly cautious policies may reduce the diversity and intensity of play options, thereby diminishing children’s overall levels of physical activity. In addition, curriculum pressures arising from standardised testing mandates contributed to shortened recess durations, as reported in nine studies. Schools facing heightened academic accountability frequently prioritised instructional time over recess, resulting in truncated or even eliminated breaks (Banks 2023; Miller II 2019). This trend reflects broader systemic challenges wherein physical activity is deprioritised in favour of academic performance metrics, despite compelling evidence supporting its cognitive and behavioural benefits.

Collectively, these policy-level factors underscore the imperative for balanced school policies that safeguard children’s safety without unnecessarily restricting active play, and that acknowledge recess as an essential component of holistic child development alongside academic achievement.

4. Discussion

4.1. Synthesis and Interpretation of Key Findings

This systematic review identified a range of interrelated factors that hinder recess physical activity, categorised across individual, interpersonal, organisational, environmental and policy levels (Pawlowski et al. 2018; Ridgers et al. 2012). The complexity of these barriers is evident, as no single factor operates in isolation; rather, they interact dynamically to shape children’s physical activity patterns (Hesketh et al. 2017). Among these, interpersonal and organisational factors—such as peer influence and supervision styles—were particularly prominent, alongside structural constraints including limited time and inadequate physical environments. The evidence underscores the multifaceted nature of barriers to recess activity, necessitating a holistic understanding that transcends reductive explanations.

The findings align closely with the *socio-ecological model*, illustrating how multiple layers of influence—from individual motivation and peer dynamics to school policies and broader institutional mandates—converge to shape recess behaviours. The interplay between these levels lends support to *social cognitive theory*, which emphasises *reciprocal determinism*, whereby behaviour is both influenced by and influences personal and environmental factors. Furthermore, the results extend *self-determination theory* by illustrating how these barriers undermine children’s *intrinsic motivation* and *perceived competence* (Guay 2022; Ryan and Deci 2016). Collectively, these theoretical frameworks illuminate the systemic nature of

recess inactivity and reinforce the need for integrated interventions that address multiple domains concurrently.

Notably, variations were observed across geographic regions, school types and age groups. For instance, studies conducted in high-income countries frequently reported safety regulations and academic pressures as key barriers, whereas research from lower-resource settings emphasised a lack of infrastructure and equipment (Rid et al. 2024). These differences may also stem from methodological approaches—such as qualitative versus quantitative designs—or from cultural norms that influence how recess is prioritised. Such nuances underscore the importance of contextual sensitivity when interpreting and applying findings across diverse educational settings.

Moreover, specific barriers frequently compound one another, thereby intensifying their impact on children’s recess activity (Massey et al. 2021; Pawlowski et al. 2014). For example, limited space, when combined with restrictive supervision and peer exclusion, can generate a reinforcing cycle of inactivity (Morton et al. 2016; Sallis et al. 1998). This synergistic effect suggests that addressing individual barriers in isolation is unlikely to yield meaningful improvements without concurrent changes across other domains.

4.2. Unanswered Questions and Gaps in the Literature

Despite recent advances in the field, several critical gaps persist. Notably, limited research has investigated barriers to recess physical activity in low- and middle-income countries, where resource constraints and cultural norms may pose distinctive challenges (Rosenkranz et al. 2023). This underrepresentation restricts global generalisability and overlooks regions where the need for school-based physical activity interventions may be particularly acute. Greater geographical diversity in research is therefore essential to build a more inclusive evidence base and to inform policy recommendations that are sensitive to diverse socio-economic and cultural contexts.

There is also a dearth of longitudinal studies that explore how barriers to recess physical activity evolve over time or influence long-term behavioural trajectories (Reiner et al. 2013). Most of the existing literature is cross-sectional, offering only static snapshots that limit understanding of causality and developmental dynamics. Moreover, the voices and experiences of marginalised groups—such as children with disabilities, those from socio-economically disadvantaged backgrounds, or ethnic minorities—remain markedly underexplored (Rana 2024). These populations may encounter unique barriers to participation that are not reflected in mainstream research, suggesting a need for more inclusive and disaggregated analyses.

Another significant gap lies in the limited exploration of economic and policy-level implications surrounding restricted recess. Few studies have examined how institutional decisions—such as reducing break durations or limiting access to outdoor facilities—impact educational attainment, mental health, or physical wellbeing. Additionally, the growing pervasiveness of digital technology continues to alter children’s behaviour, yet its influence on recess-time physical activity remains insufficiently investigated. The extent to which screen-based entertainment, mobile phone usage, or social media displaces physically active play represents an emerging area of concern requiring targeted inquiry.

From a methodological standpoint, the field remains heavily reliant on self-reported data, which are vulnerable to social desirability and recall bias. Objective measures—such as accelerometry and GPS tracking—are underutilised despite offering greater accuracy in quantifying activity levels and spatial patterns during recess. Furthermore, the dominance of cross-sectional research designs limits causal inference and obscures temporal dynamics. To better account for the complex, multilevel nature of recess activity barriers, future research should prioritise robust mixed-methods approaches. Triangulated designs that integrate qualitative insights with quantitative data (Noyes et al. 2019) can more effectively capture the interplay between physical, social, and institutional determinants, thereby yielding richer and more actionable findings.

4.3. Implications for Policy and Practice

The *multifactorial* nature of recess activity barriers necessitates comprehensive, *multi-level interventions* that address individual, institutional, and systemic dimensions simultaneously (Graham et al. 2022). Policymakers should consider legislating *minimum recess durations* and developing explicit, evidence-based guidelines that reconcile safety with the autonomy and spontaneity essential for meaningful play (Suleman et al. 2023). Investment in *playground infrastructure and equipment* must be prioritised to ensure the physical environment supports diverse, engaging, and safe opportunities for movement (Sallis et al. 1998).

At the institutional level, school leaders and administrators should be encouraged to *optimise playground design* to reduce overcrowding and facilitate multiple forms of play, catering to varied interests and developmental needs. Cultivating a school culture that places *intrinsic value on active recess*—rather than viewing it as secondary to academic learning—is likewise crucial (Raney et al. 2023).

Teachers and playground supervisors hold pivotal roles in shaping recess dynamics. They should receive *professional development in positive supervision techniques* that balance

structure with autonomy, avoid excessive restrictions, and promote inclusive, vigorous play (Sullivan and Glanz 2005). Moreover, *modelling active behaviour* and engaging directly with children during recess can enhance both *motivation* and *participation* (Salmon et al. 2007).

The role of *parents and the broader community* must not be overlooked. Family advocacy and community-led programmes can amplify the value of active recess, extending its benefits beyond school hours. Collaborative efforts that link schools with *local organisations*, municipal authorities, and health promotion bodies are vital for cultivating environments that consistently support physical activity (McLoughlin et al. 2021; Pate et al. 2006).

Implementation, however, remains context-dependent. In many settings, schools face *resource limitations*, *curricular pressures*, and *entrenched cultural attitudes* that may deprioritise play (Massey et al. 2021). Nonetheless, current global emphasis on children's *physical and mental wellbeing*—heightened in the wake of post-pandemic recovery—presents a strategic opportunity for policy intervention and systems-level reform. Effectively addressing barriers will require *context-sensitive approaches*, *inclusive stakeholder engagement*, and a sustained commitment to embedding recess as a core component of child development and educational quality.

4.4. Strengths and Limitations of the Review

This review presents several strengths, most notably its adherence to *Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA)* guidelines, which ensured methodological transparency and reproducibility. A comprehensive search strategy was employed across multiple academic databases, enhancing the likelihood of capturing a wide breadth of relevant studies. Dual screening and data extraction processes, combined with the critical appraisal of methodological quality, contributed to the reliability and validity of the review outcomes. Furthermore, the inclusion of a broad spectrum of study designs and contextual variables facilitated a nuanced synthesis of the diverse and interrelated factors that hinder recess physical activity in school settings.

However, certain limitations must be acknowledged. First, the restriction to English-language publications may have excluded pertinent studies published in other languages, thereby introducing potential *language bias*. Second, the review is susceptible to *publication bias*, as studies with statistically significant results are more likely to be published than those with null or negative findings. Third, considerable heterogeneity was observed across included studies in terms of population characteristics, methodological approaches, and sociocultural contexts. This variability limits the direct comparability of findings and constrains the extent to which conclusions may be generalised across settings.

Moreover, the exclusive focus on published, peer-reviewed literature may have omitted valuable insights contained within *grey literature*, such as governmental reports, policy documents, or unpublished theses. Finally, while thematic synthesis provided a structured framework for interpreting findings, it inevitably involved a degree of subjective judgement. Although this subjectivity was mitigated through systematic coding and methodological rigour, it cannot be entirely eliminated.

In sum, despite these limitations, the strengths of this review—in its scope, methodological integrity, and analytical depth—position it as a credible and timely contribution to the evidence base on barriers to recess physical activity. It offers critical insights that may inform future research, policy development, and educational practice.

5. Conclusion

5.1. Summary of Major Insights

This review demonstrates that recess physical activity is impeded by a complex and interconnected constellation of factors spanning individual, interpersonal, organisational, environmental, and policy domains. Among these, *peer dynamics*, restrictive supervision practices, insufficient recess duration, inadequate physical infrastructure, and stringent safety regulations emerged as the most persistent and influential barriers. These multifactorial impediments collectively constrain children's opportunities and motivation to engage in physically active play during recess periods. The findings underscore that the barriers are neither isolated nor one-dimensional, but rather interdependent elements that reinforce one another—necessitating holistic, contextually responsive strategies to mitigate their impact and promote equitable access to meaningful physical activity opportunities for all children.

5.2. Overall Significance

The barriers identified in this review hold far-reaching implications that extend beyond children's physical health to encompass their *social*, *emotional*, and *cognitive* development. These impediments compromise opportunities for holistic growth, active engagement, and psychosocial flourishing during formative years. Addressing such hindrances is thus imperative not only for fostering long-term physical wellbeing but also for enhancing academic outcomes and promoting equitable child development. A systems-level response—featuring coordinated efforts across schools, families, communities, and policymakers—is essential. Only through systematic recognition and multi-tiered, context-sensitive interventions can supportive recess environments be created that sustainably embed physically active behaviours into children's everyday lives.

5.3. Future Research Directions

Future research should prioritise *longitudinal* designs to elucidate causal pathways between identified barriers and patterns of recess physical activity over time. *Mixed-methods* approaches are particularly valuable in capturing the nuanced perspectives of children, educators, and parents, offering a more comprehensive understanding of contextual and interpersonal dynamics. Intervention studies ought to focus on *multi-component*, ecologically grounded strategies that simultaneously address intersecting barriers, with a deliberate emphasis on underrepresented populations and low-resource educational settings. Such investigations will be instrumental in shaping evidence-informed policy reforms and practical frameworks that advance equitable access to quality recess physical activity on a global scale.

Declaration of Competing Interest:

The authors declare that there are no known competing financial interests or personal relationships that could have appeared to influence the work reported in this article.

Ethical Considerations:

This study was conducted in accordance with the ethical guidelines and regulations approved by the Ethics Committee of Henan Normal University. As this is a systematic review, no primary data involving human participants were collected. Therefore, informed consent was not applicable.

Funding:

The authors did not receive any specific funding for this work.

Authors' Contributions:

Huang, X. H. conceptualised and designed the study, developed the search strategy, conducted the literature screening, performed the thematic synthesis, and drafted the manuscript.

Zainudin Bin Mohd Isa supervised the research project, provided methodological guidance, critically reviewed the study framework, and contributed to the revision and final editing of the manuscript.

Huang, X. Y. assisted in data searching, screening, and extraction, and contributed to the review and editing of the manuscript.

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