REVISTA INVECOM
ISSN en línea: 2739-0063

# Pedagogical strategies for the development of gross motor skills in early childhood education: a systematic review

*Estrategias pedagógicas para el desarrollo de la psicomotricidad gruesa en educación inicial: una revisión sistemática*

**Received:** 23/03/2026 **- Accepted:** 12/06/2026

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## Abstract

In the contemporary educational landscape, gross motor skills are crucial for the holistic development of infants, integrating affective, cognitive, and social dimensions. The objective of this study was to determine the pedagogical strategies for their development in early childhood education through a systematic review. Methodologically, a qualitative and documentary approach was applied, following the PRISMA protocols. The search was conducted in the Scopus, Web of Science (WoS), SciELO, and Dialnet databases, using the following descriptors and Boolean operators: ("gross motor skills" OR "gross motor skills") AND ("pedagogical strategies" OR "educational intervention") AND ("early childhood education" OR "early childhood"), as well as their English equivalents: ("gross motor skills") AND ("pedagogical strategies") AND ("early childhood education"), from 2022 to 2026, without geographical restrictions. An initial 500 records were identified, from which 20 studies were selected. As a result, it is confirmed that strategies based on games (traditional, cooperative, and structured play), indigenous and children's dances, and circle games are highly effective for motor development. It is concluded that these interventions transcend the physical, positively impacting spatial perception, coordination, balance, autonomy, socialization, and meaningful learning. It is recommended to implement regular psychomotor workshops with specialized teacher support and adequate infrastructure in educational centers.

**Keywords**: Strategies, psychomotor skills, development, learning, education.

## Resumen

En el escenario educativo contemporáneo, la psicomotricidad gruesa es determinante para el desarrollo integral del infante, articulando dimensiones afectivas, cognitivas y sociales. El objetivo del estudio fue determinar las estrategias pedagógicas para su desarrollo en educación inicial mediante una revisión sistemática. Metodológicamente, se aplicó un enfoque cualitativo y documental bajo los protocolos PRISMA. La búsqueda se realizó en las bases de datos Scopus, Web of Science (WoS), SciELO y Dialnet, empleando los siguientes descriptores y operadores booleanos: ("psicomotricidad gruesa" OR "motricidad gruesa") AND ("estrategias pedagógicas" OR "intervención educativa") AND ("educación inicial" OR "primera infancia"), así como sus equivalentes en inglés: ("gross motor skills") AND ("pedagogical strategies") AND ("early childhood education"), desde el año 2022 hasta 2026, sin restricción geográfica, identificando inicialmente 500 registros, de los cuales se seleccionaron 20 estudios. Como resultado, se confirma que las estrategias basadas en juegos (tradicionales, cooperativos y lúdicos estructurados), danzas autóctonas e infantiles, y rondas son altamente efectivas para el desarrollo motor. Se concluye que estas intervenciones trascienden lo físico, impactando positivamente en la percepción espacial, coordinación, equilibrio, autonomía, socialización y aprendizaje significativo. Se recomienda implementar

talleres periódicos de psicomotricidad con acompañamiento docente especializado e infraestructura adecuada en los centros educativos.

**Palabras clave:** Estrategias, habilidades psicomotoras, desarrollo, aprendizaje, educación.

## Introduction

Discussions of child development often prioritize literacy and writing skills as the primary markers of school readiness. Yet well before a child picks up a pencil, the body undergoes a foundational process: the mastery of gross motor movement. According to Borjas (2026), this constitutes an essential pillar of human development, underpinning the acquisition of cognitive, social, and emotional competencies in early childhood. Ushtelenca et al. (2024) define gross motor skills as whole-body movements (walking, running, jumping, balancing, and coordinating large muscle groups). Insufficient development in these areas curtails children's physical participation and long-term well-being (Vagnetti et al., 2025).

Variations in gross motor development reveal that some children exhibit significant delays relative to age-expected norms (Tan & Lim, 2025). Younger children typically display less efficient movement patterns, poorer body control, and reduced motor precision compared to their older peers (Ziccardi et al., 2025). Such findings are critical for educators, as they help prevent misdiagnoses. Beyond age, other constraints may affect schoolchildren. Medina (2022) reported that prior to intervention, 73.3% of assessed children fell into the lower range of gross motor proficiency, underscoring substantial developmental challenges. Ochoa and Mamani (2022) identified factors that negatively influence gross motor development, including passive video game use, which curtails physical activity and essential bodily movements, as well as sensory, environmental, and stimulation deficits (Domínguez et al., 2022).

Assessing motor competence during the school years is essential, given that many children exhibit insufficient motor performance levels (Sulla et al., 2024). Such assessments should be conducted on a regular basis. Tan and Lim (2025) assert that periodic evaluation of gross motor skills enables the identification of developmental discrepancies and provides valuable data for early educational intervention. Within this framework, psychomotricity is understood as the field that examines the interplay between psychic functions, motor functions, and motor behavior, integrating a relational perspective between mind and body (Matias et al., 2023).

Developing gross motor skills involves strengthening basic body positioning and the balance associated with posture and mobility. Deficits in these areas compromise children's motor performance (Calero et al., 2023). Consequently, there is a pressing need to incorporate psychomotor methodologies into the educational system that foster meaningful learning, long-term memory, and academic outcomes (Nogué et al., 2025). To this end, school programs require teachers who are trained to design, implement, and evaluate physical activities tailored to students' needs (Moon et al., 2024).

Pedagogically, there is a tendency to mechanize the teaching of physical skills, overlooking the fact that these abilities serve as cognitive tools oriented toward autonomy. For this reason, the present study aimed to determine the pedagogical strategies for developing gross psychomotor skills through a systematic review. This topic was selected because psychomotricity affects both the physical and cognitive capacities of human beings (Tumbaco, 2022). Moreover, as Vagnetti et al. (2025) note, the development of gross motor skills during childhood is crucial for building more complex movements and for establishing the foundations of physical activity, health, and well-being across the lifespan.

When alterations in these skills are present, structured interventions are recommended to enhance children's motor competence (Guo et al., 2024). In this context, school physical education provides an appropriate environment for children to explore their relationship with the environment, thereby fostering psychomotor, cognitive, and social development (Martins et al., 2022). Given the scenario described, the following research question emerged: What pedagogical strategies for developing gross psychomotor skills are identified in the systematic review literature?

## Methodology

The study adopted a qualitative approach and a documentary research design, following the parameters of systematic review and the PRISMA protocols defined by Page et al. (2021) as the minimum evidence-based set of items for reporting systematic reviews and meta-analyses. The selection process was represented through a flow diagram, as per Urrútia and Bonfill (2010), including the number of records identified, included, and excluded, along with the reasons for exclusion at each phase.

Search strategy

The systematic search was conducted across Scopus, Web of Science (WoS), SciELO, and Dialnet, using the following descriptors and Boolean operators: ("psicomotricidad gruesa" OR "motricidad gruesa") AND ("estrategias pedagógicas" OR "intervención educativa") AND ("educación inicial" OR "primera infancia"), as well as their English equivalents: ("gross motor skills") AND ("pedagogical strategies") AND ("early childhood education"). The search period spanned from 2022 to 2026, with no geographic restrictions. Based on these protocols, the following phases were established:

Identification phase

During this phase, a systematic literature search was performed across the electronic databases. A total of 500 records potentially relevant to the research objectives were identified. Subsequently, 50 duplicate records (references retrieved more than once across different databases) were removed, leaving 450 unique records to proceed through the selection process.

Screening phase

In the screening phase, the 450 unique records were independently evaluated by two reviewers through title and abstract reading. The aim was to identify and exclude articles that did not meet the inclusion criteria established in the protocol. During this initial assessment, 350 records were excluded for failing to meet thematic, methodological, or population criteria, or for corresponding to ineligible publication types. The remaining 100 records were considered potentially eligible.

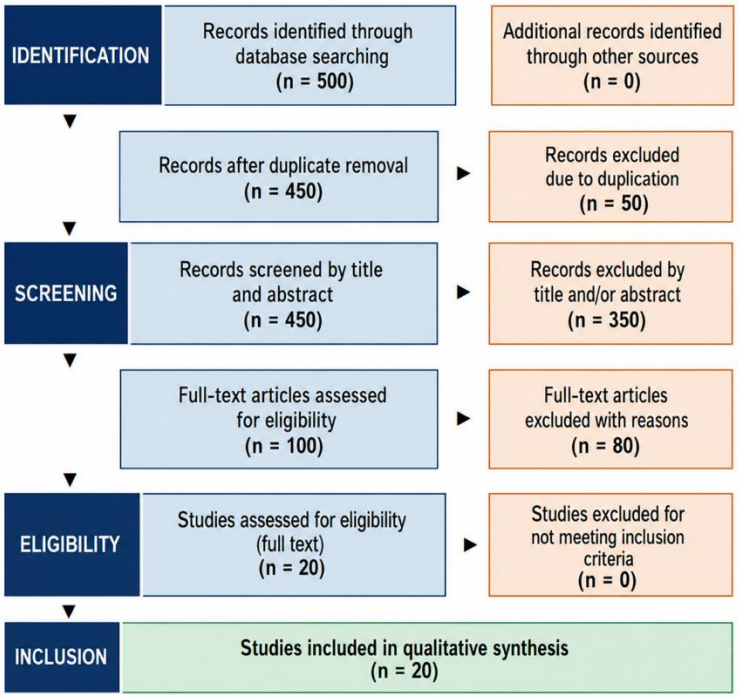
Eligibility phase

In this phase, the 100 full-text articles retrieved underwent exhaustive evaluation through the application of the defined inclusion and exclusion criteria. Following complete reading, 80 articles were excluded for various reasons: inappropriate study population, irrelevant intervention, incompatible methodological design, absence of outcomes of interest, or inability to access the full text. Each exclusion reason was recorded following PRISMA recommendations. The remaining 20 studies fully satisfied all inclusion criteria.

Inclusion phase

Finally, in the inclusion phase, the 20 studies that surpassed all previous stages of the selection process were incorporated into the systematic review. These studies were included in the qualitative synthesis of the evidence.

**Figure 1.** *Flow diagram illustrating the sample selection process through the systematic review.*




Source: Author's own elaboration

## Results

**Table 1.** *Findings from the selected sample based on PRISMA protocols.*

| No. | Author(s) | Title | Type of Study | Findings |
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| 1 | Nielsen et al. (2023) | Fine and gross psychomotricity in early childhood before and during COVID-19 | Article | During the analysis, no significant gender-related differences were identified; however, age emerged as a determining and influential factor at this developmental stage. |
| 2 | Borjas (2026) | Play-based strategies and gross psychomotricity in early childhood education at a public institution in Trujillo, Peru | Article | The findings positioned structured play-based strategies as an effective, replicable, and low-cost pedagogical tool for strengthening psychomotor development in early childhood. |
| 3 | Quilla (2024) | Indigenous dances and their influence on gross psychomotor development in students at Early Childhood Education | Thesis | Indigenous dances demonstrated a significant impact on gross psychomotor development, highlighting their potential as a pedagogical tool for early childhood education. |

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| | | Institutions in the San Miguel District, 2024 | | |
| 4 | Ferreras & Ramírez (2025) | Psychomotor workshop to improve gross motor skills in early childhood students at an educational center in Bahoruco province | Thesis | The proposed implementation of a psychomotor workshop constitutes a relevant, viable, and effective strategy for strengthening motor development in early childhood and enhancing teachers' pedagogical competencies, with potential applicability in other educational contexts. |
| 5 | Tumbaco (2022) | Methodological guide for developing gross psychomotricity in early childhood students | Thesis | This type of motor skill is essential to students' formative process and constitutes a relevant aspect insofar as it promotes motivation for children's abilities toward autonomy and independence, with appropriate support throughout their lives. |
| 6 | Chávez & Mejía (2026) | Frequency of strategy use for developing the psychomotor domain by teachers in early childhood educational institutions, Celendín 2023 | Thesis | The research concluded that 25% of teachers reported implementing psychomotor development strategies almost always, while 75% indicated they always do so. |
| 7 | Sánchez et al. (2024) | Cooperative games for psychomotor development in early childhood students: A systematic review | Article | Cooperative games have proven to be an effective tool for improving psychomotor skills in early childhood students. |
| 8 | Ramírez et al. (2025) | Children's dance for developing gross psychomotricity in Early Childhood Education students | Article | The results indicated notable progress in children's motor coordination. Evaluating children's dance as a tool for developing gross psychomotricity is crucial for improving motor skills. |
| 9 | Flores & Sánchez (2024) | Gross psychomotricity and its impact on school-age childhood development | Article | Gross psychomotricity has a significant impact on motor, cognitive, and socio-affective development components during the school-age childhood stage. |

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| 10 | Huilcas & Zaravia (2024) | Traditional games in the development of gross psychomotricity in 5-year-old children at an early childhood education institution in Huancavelica | Thesis | In the post-test, 100% of the children reached an outstanding achievement level. Consequently, traditional games significantly influence gross psychomotor development in 5-year-old children. |
| 11 | Choque & Quispe (2024) | Play-based activities for developing gross psychomotricity in children at Educational Institution No. 506, Tungasuca – Tupac Amaru – Canas – Cusco, 2023 | Thesis | The most significant conclusion was the asymptotic significance (p-value = 0.000), which is below 0.05. This indicates that implementing play-based activities improves gross psychomotricity in 4- and 5-year-old children. |
| 12 | Vásquez (2024) | Play-based strategies for improving gross psychomotricity in 5-year-old children at Educational Institution No. 220 Guadalupe Camporredondo, 2023 | Thesis | The implemented play-based strategies had a significant and positive impact on gross psychomotor development in 5-year-old children. These findings support the effectiveness of playful interventions as a pedagogical tool for promoting motor development in the studied population. |
| 13 | Borja et al. (2025) | Developing gross psychomotricity through the implementation of children's circle games | Article | The results evidenced notable improvement in children's gross motor skills, confirming that circle games are effective tools that foster psychomotor development in a playful and recreational manner. The conclusions highlight the relevance of these practices in the educational context for enhancing children's motor capacities. |
| 14 | Pulido (2024) | Traditional games for developing gross psychomotricity in 4-year-old children at Early Childhood Educational Institution No. 319 – | Article | In the pre-test and post-test, 93% of children achieved the expected level of gross psychomotor development. It was therefore concluded that traditional games improve gross psychomotor development at a significance level of p=0.000 < 0.05. |


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| | | Chimbote – Áncash – 2021 | | |
| 15 | Pastrana et al. (2023) | Gross motor skills and their impact on flexibility and movement coordination | Article | The importance and utility of gross motor skills at an early age are recognized. The study proposes activities that significantly support gross motor development in 3-year-old children and, consequently, their overall development. |
| 16 | Chirinos (2025) | Gross psychomotricity and the development of spatial perception in children at the Grupo Emperador Educational Institution in Arequipa, 2024 | Thesis | The results showed a strong and significant relationship between gross psychomotricity and spatial perception in children, indicating that those with better motor skills also possess greater capacity to interact with their spatial environment. This highlights the interrelation between motor and cognitive development and underscores the importance of integrating both domains in educational interventions or physical activities. |
| 17 | Libicota (2024) | Gross motor skills and their impact on the teaching-learning process in early childhood students at Dr. Manuel Benjamín Carrión Educational Unit | Thesis | The results revealed difficulties such as lack of motor coordination and insufficient early stimulation, with repercussions for participation in physical activities and games—aspects crucial for social development, according to Vygotsky. |
| 18 | Bravo (2024) | Play-based circuits in psychomotor development in early childhood education | Article | The conclusions highlight the need for greater teacher training, improved educational infrastructure, and increased attention to psychomotricity in children's early years to promote comprehensive and healthy development. |
| 19 | Millingalle et al. (2024) | Children's dance in gross psychomotricity in Early Childhood Education | Article | Teachers lack awareness of the importance of children's dance as a highly useful strategy that strengthens body movements, concentration, balance, emotions, rhythm, and spatial awareness, providing developmental resources for students to become independent |

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| | | | | individuals and generate meaningful learning. |
| 20 | Acosta (2022) | Virtual didactic strategies for developing gross psychomotricity in Early Childhood Education students | Thesis | Pretest results revealed values exceeding 50%, indicating that children generally experience problems in gross psychomotor development. |

Source: Author's own elaboration

Table 1 presents a summary of the 20 selected studies. A balanced distribution between document types was observed, with 10 articles and 10 theses (50% each). Regarding the central theme, 95% of the studies focused on gross psychomotricity, with Nielsen et al. (2023) being the sole study addressing fine motor skills. The most frequently evaluated intervention strategies included play-based or game-based approaches (present in studies by Borjas, 2026; Sánchez et al., 2024; Choque & Quispe, 2024; Vásquez, 2024; and Bravo, 2024), followed by traditional games (studies by Huilcas & Zaravia, 2024, and Pulido, 2024), indigenous or children's dances (studies by Quilla, 2024; Ramírez et al., 2025; and Millingalle et al., 2024), and children's circle games (study by Borja et al., 2025).

Positive effects were reported across all cases. For instance, structured play-based strategies emerged as an effective and low-cost pedagogical tool (Borjas, 2026), while indigenous dances demonstrated a significant impact on gross motor development (Quilla, 2024). Cooperative games and children's dance also proved effective, with notable progress in motor coordination (Sánchez et al., 2024; Ramírez et al., 2025). In statistically supported studies, traditional games enabled 100% of children to reach an outstanding level in the post-test (Huilcas & Zaravia, 2024); both play-based activities and traditional games reported asymptotic significances of p=0.000 (Choque & Quispe, 2024; Pulido, 2024), indicating significant improvements. Similarly, children's circle games evidenced notable improvement in gross motor skills (Borja et al., 2025). Only one study (Bravo, 2024) noted that while play-based circuits are beneficial, better infrastructure and enhanced teacher training are required.

Important gaps were also identified. Teacher unawareness of the potential of children's dance as a strategy (Millingalle et al., 2024), insufficient training, and inadequate infrastructure (Bravo, 2024) emerged as recurrent limitations. Furthermore, virtual contexts revealed developmental problems in more than 50% of children (Acosta, 2022), and the lack of early stimulation affected participation in physical activities and social development (Libicota, 2024).

Regarding evidence quality, only two studies (Choque & Quispe, 2024; Pulido, 2024) reported p-values (both 0.000), and two more provided clear quantitative results (Chávez & Mejía, 2026: 75% of teachers always implementing strategies; Huilcas & Zaravia, 2024: 100% achievement). The remaining 70% of studies presented exclusively descriptive or qualitative findings.

**Table 2.** *Classification of studies according to strategies for developing gross psychomotricity.*

| No. | Thematic category | Studies addressing it | Description |
|---|---|---|---|
| 1 | Play-based strategies for gross psychomotor development | 2, 11, 12, 20 | Analyze the effectiveness of play-based activities, guided games, and recreational strategies as pedagogical tools for strengthening motor coordination, balance, autonomy, and body skills in early childhood students. |

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| 2 | Traditional and cooperative games as psychomotor resources | 7, 10, 14 | Highlight the educational value of traditional and cooperative games for significantly improving gross psychomotricity, social interaction, cooperation, and child motor development. |
| 3 | Dance and body expression in psychomotor development | 3, 8, 19 | Demonstrate that children's dance and indigenous dances favor motor coordination, balance, rhythm, spatial perception, body expression, and comprehensive child development. |
| 4 | Workshops and psychomotor intervention programs | 4, 18 | Evaluate structured programs and psychomotor workshops that strengthen motor capacities, improve teaching practice, and promote comprehensive development in early childhood. |
| 5 | Importance of gross psychomotricity in holistic development | 1, 5, 9, 15, 16 | Examine the influence of gross psychomotricity on motor, cognitive, spatial, socio-emotional, and autonomy dimensions, highlighting its fundamental role during childhood. |
| 6 | Diagnosis of difficulties and needs in psychomotor development | 6, 17, 18, 20 | Identify limitations related to insufficient early stimulation, limited teacher training, motor coordination problems, and the need to strengthen educational strategies to improve psychomotor development. |
| 7 | Children's circle games and recreational activities for motor strengthening | 13 | Examines the use of children's circle games as a recreational and pedagogical strategy for enhancing gross motor skills, socialization, and learning through play. |

Source: Author's own elaboration

## Discussion

The results of this systematic review demonstrate a high degree of consistency regarding the effectiveness of play-based and traditional pedagogical strategies for developing gross psychomotricity in early childhood students. Ninety-five percent of the analyzed studies focused exclusively on gross motor skills, and none reported negative or null effects, suggesting a strong consensus in the literature on the value of these interventions. This unanimity may also reflect a potential publication bias, as non-significant or negative results tend to remain unpublished.

Consistent with the arguments of Borjas (2026) and Tumbaco (2022), structured play-based strategies, traditional games, and children's circle games emerge as effective, replicable, and low-cost pedagogical tools. The studies by Huilcas and Zaravia (2024) and Pulido (2024) reported notable improvements, with 100% and 93% of children reaching outstanding achievement levels, respectively, and statistical significances of p=0.000. These figures surpass those reported by Medina (2022), who identified that 73.3% of children were at a lower level prior to intervention, reinforcing the need for systematic implementation of these practices.

The review also revealed important gaps. Despite the favorable evidence, studies such as those by Millingalle et al. (2024) and Bravo (2024) caution against teacher unawareness of the potential of children's dance and the need for enhanced training and adequate infrastructure. This finding aligns with Moon et al. (2024), who emphasize that teachers require specific training to design, implement, and

evaluate adapted physical activities. Additionally, Acosta (2022) found that more than 50% of children exhibited psychomotor developmental problems in virtual contexts, highlighting the importance of in-person environments and early stimulation.

From a theoretical standpoint, the findings support the integrative view of psychomotricity proposed by Matias et al. (2023), wherein mind and body interact. The relationship identified by Chirinos (2025) between gross motor skills and spatial perception, along with the impact on learning noted by Nogué et al. (2025), confirms that these abilities are not merely physical but underpin cognitive and socio-emotional development. Nevertheless, the majority of studies (70%) provided only descriptive or qualitative analyses, lacking confidence intervals and effect sizes, which limits the robustness of causal inferences.

## Conclusions

This systematic review confirms that pedagogical strategies based on games (traditional, cooperative, and structured play), indigenous and children's dances, and children's circle games are highly effective for developing gross psychomotricity in early childhood students. Statistically supported studies ($p=0.000$) demonstrate significant improvements, with achievement levels exceeding 90%.

Despite the demonstrated efficacy, important limitations persist, including teacher unawareness of the use of children's dance, insufficient specific training, and inadequate infrastructure conditions. This suggests that recommending these strategies is insufficient; policies for ongoing professional development and the provision of appropriate physical spaces are required.

The reviewed evidence supports that gross motor development positively influences spatial perception, coordination, balance, autonomy, socialization, and meaningful learning. Its promotion should therefore be a cross-cutting priority in the early childhood education curriculum, not an optional supplement. As Tan and Lim (2025) point out, continuous assessment of gross motor skills enables early identification of delays.

Finally, educational centers are advised to implement regular gross psychomotor workshops using traditional games, dances, and play-based circuits, with specialized teacher support.

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