



Physical and Sports Activities as a Tool for Inclusion: Exploring Physiological and Psychosocial Benefits

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Abstract

Objectives. The main objective of the study is to promote the development of fundamental motor skills and social inclusion in primary school through the implementation of an inclusive educational intervention based on motor and sports activities.

Materials and Methods. The study employed a quasi-experimental design with an experimental group and a control group. A total of 80 fifth-grade primary school students participated in the study (40 in the experimental group and 40 in the control group), including 10 students with Special Educational Needs (SEN), with a mean age of 10.4 ± 0.5 years. The experimental group participated in a structured motor activity intervention. Fundamental motor skills were assessed using the TGMD-3, perceived inclusion was measured using the PIQ, and behaviours during activities were recorded through systematic observation. Assessments were conducted at pre-test (T0), post-test (T1), and follow-up (T2).

Results. The results showed significantly greater improvements in the experimental group than in the control group in fundamental motor skills, perceived inclusion, active participation, cooperation, and peer interactions. Observational data also confirmed higher-quality relational dynamics in the group that received the intervention.

Conclusions. In light of the findings, the structured motor intervention may produce positive effects on both the development of motor competencies and inclusive processes in primary school, simultaneously promoting motor learning, social participation, and educational inclusion, including among students with SEN.

Keywords: inclusion, fundamental movement skills, cooperative learning, special educational needs (SEN).

Introduction

In the context of primary school, motor activity represents a privileged tool for the development of fundamental motor skills and for the promotion of social and relational competences; indeed, basic motor skills such as running, jumping, throwing, and catching constitute the prerequisite for active participation in games and sports activities throughout life (Sasayama et al., 2025). In this regard, beyond motor development, a central aspect of motor activity is represented by the inclusive dimension; school-based motor activity in fact does not represent only a context of physical learning, but also and above all a social environment capable of creating peer relationships, a sense of belonging, and participation.

In this context, students with Special Educational Needs (SEN) are at greater risk of exclusion and reduced participation in physical education, highlighting the need

for inclusive, flexible, and adapted teaching approaches that enable meaningful engagement for all learners (Haegele & Sutherland, 2015; Gazali et al., 2025; Jariono et al., 2025). Inclusive physical education provides a pedagogical framework that promotes equitable access to learning opportunities regardless of students' physical, cognitive, sensory, or socio-cultural characteristics and encourages active participation through appropriately designed learning environments (Lieberman et al., 2020; Jariono et al., 2025). Within this framework, motor activities can simultaneously foster the development of fundamental motor competence and promote social participation, cooperation, and a sense of belonging, transforming physical education into an inclusive learning environment that supports both individual development and collective well-being (Boke et al., 2025; Haegele & Sutherland, 2015).

Within this perspective, inclusive physical education should be understood as a reciprocal process in which all students actively contribute to the creation of an inclusive learning environment, rather than as an approach focused solely

on adapting activities for students with Special Educational Needs (SEN) (Haegele & Sutherland, 2015). Accordingly, the present intervention was designed by integrating Cooperative Learning strategies and the principles of Universal Design for Learning (UDL), both of which have been recognised as effective pedagogical approaches for promoting meaningful participation, peer interaction, and equitable access to learning in physical education (Lieberman et al., 2020; Boke et al., 2025). Within the UDL framework, instructional adaptations are incorporated into lesson design from the outset, reducing the stigma associated with differentiated activities and creating learning environments in which all students can participate according to their individual abilities (Lieberman et al., 2020). Consistent with this perspective, recent evidence indicates that inclusive sport-based educational programmes can enhance students' sense of belonging, relational well-being, and active participation within the school community (Gravino et al., 2026).

Based on these pedagogical principles, the present intervention was designed using a flexible and cooperative approach in which task adaptation, simplified rules, and differentiated participation opportunities were integrated to create an inclusive learning environment where every student could actively contribute according to individual abilities (Lieberman et al., 2020; Boke et al., 2025; Gazali et al., 2025). Bocce was selected as the core activity because its simple rules, low physical demands, and high adaptability make it particularly suitable for inclusive physical education, allowing students with different levels of motor competence to participate meaningfully while promoting both motor learning and positive peer interaction (Gravino et al., 2026). Moreover, the game requires movement control, precision, eye-hand coordination, and motor planning, while remaining easily adaptable to different ability levels, making it an appropriate educational tool for heterogeneous school groups. Recent evidence also suggests that structured motor interventions combining cognitive engagement with adaptable motor tasks can enhance executive functions and facilitate active participation among students with diverse learning needs (Latino et al., 2025a).

Despite the growing interest in inclusive physical education, the available literature still indicates a limited number of experimental studies that simultaneously examine the effects of adapted traditional games, such as bocce, on both fundamental motor competence and socio-relational outcomes in authentic school settings involving students with Special Educational Needs (SEN) (Gazali et al., 2025; Jariono et al., 2025; Gravino et al., 2026). Therefore, the present study aimed to evaluate the effectiveness of a structured inclusive bocce programme in improving fundamental motor skills and perceived social inclusion among primary school pupils, including students with SEN. Specifically, the study examined changes in fundamental motor skills assessed using the Test of Gross Motor Development-3 (TGMD-3), perceived inclusion measured using the Perceptions of Inclusion Questionnaire (PIQ), and behavioural indicators of participation, cooperation, and peer interaction obtained through structured systematic observation by comparing the experimental and control groups.

Materials and Methods

Study Design

The didactic-motor intervention was structured in a regular primary school setting and aimed to promote the development of fundamental motor skills and foster inclusive

peer dynamics. Specifically, the study adopts a longitudinal quasi-experimental design with a non-equivalent control group and included three assessment time points: pre-test (T0), post-test (T1), and follow-up (T2) conducted three months after the intervention in order to obtain a comprehensive evaluation both of the immediate effects and of the temporal stability of the proposed intervention. In addition, in order to strengthen methodological validity and to achieve a deeper understanding of the impact of the intervention, the study was structured using a mixed-method approach, combining standardized quantitative measures with qualitative indicators of inclusive behaviour through structured systematic observation, conducted by two independent observers, in order to also detect behavioural and socio-relational dimensions during the activities.

Participants

The study sample consisted of 80 fifth-grade primary school students and was divided into two groups: an experimental group ($n = 40$) undergoing a structured program of motor activities based on inclusive bocce; and a control group ($n = 40$) who carried out the usual, non-structured and non-adapted curricular motor activities. The mean age of the sample was 10.4 ± 0.4 years, consistent with the relevant school level; the sample was also composed of 42 males (52.5%) and 38 females (47.5%), and 10 students with Special Educational Needs (SEN) were present, equally distributed between the two groups. All participating students were regularly enrolled in primary school and regularly took part in the motor activities provided by the school curriculum, while students with clinical or motor conditions that could prevent safe participation in the proposed activities were excluded from the study. Prior to the start of the study, informed consent was obtained from parents or legal guardians, and all procedures were conducted in accordance with the ethical principles of educational research.

Procedure

The total duration of the intervention was 16 weeks, articulated into 2 weekly sessions lasting 60 minutes each, for a total of 32 motor sessions and 32 total hours of activity, which were carried out in a school setting during physical education lessons, in a natural and inclusive environment. Each session was organized according to a standardized structure for the experimental group, while in parallel the control group participated in the usual curricular motor activities provided by the school program, without exposure to the structured protocol based on inclusive bocce. The study protocol was designed according to principles of inclusive and adapted teaching, including adjustments such as reducing throwing distances, varying materials (weight and size of the bocce balls), visual and demonstrative supports, and peer tutoring strategies to promote full participation of students, including those with Special Educational Needs (SEN), while preserving the educational value of the motor task.

Measures

Measurements were conducted at three time points: pre-intervention (T0), post-intervention (T1), and follow-up (T2) three months after the intervention. The study included intra-group (paired-samples t-tests) and inter-group (independent-

samples t-tests) comparisons in order to evaluate the impact of the inclusive bocce program on motor and inclusive outcomes and adopted a multi-method approach, integrating quantitative and qualitative tools in order to obtain a comprehensive assessment of the effects and in addition to statistical significance, Cohen's d effect sizes were computed to assess the practical relevance of the observed differences.

Among the instruments, the Test of Gross Motor Development-3 (TGMD-3) was used in order to assess fundamental motor skills at the three time points: T0, T1, and T2. The test allows a standardized evaluation of movement quality through specific observational criteria organized into two main domains:

- *Locomotor skills*: running, galloping, hopping, standing long jump, and side sliding, which reflect the ability to move the body through space;
- *Object control skills*: overhand throw, catch, kick, dribble, and strike with an implement, which measure hand-eye coordination and control of moving objects.

Another instrument used was the Perceptions of Inclusion Questionnaire (PIQ), administered at the three time points T0, T1, and T2 in a simplified Likert format ranging from 1 to 5, with higher scores indicating greater perceived inclusion, suitable for the participants' age. This is a standardized questionnaire that explores specific dimensions such as (i) sense of belonging to the class group, (ii) participation in activities, (iii) peer relationships, and (iv) perceived social acceptance.

Finally, throughout the duration of the intervention, a structured systematic observation was conducted by two independent observers. The observed variables were (i) active participation; (ii) peer interaction; (iii) cooperation; (iv) rule compliance. For each variable, a structured observational grid with a predefined rating scale was used, and inter-observer reliability was calculated using Cohen's Kappa, with values ranging between 0.82 and 0.91, indicating a high level of agreement.

Intervention

The intervention was designed according to a progressive model of inclusive motor education, structured into four phases aimed at the gradual development of fundamental motor skills and socio-relational competences in order to promote inclusion. Approximately one week before the start of the 16-week program, participants were invited to a dedicated introductory meeting during which the project, its objectives, and the procedures of the activities were presented. Prior to the start of the inclusive protocol, both groups were administered the TGMD-3 and PIQ pre-tests; administration was conducted according to standardized and identical procedures for both groups in order to ensure the internal validity of the research design and the comparability of the results. In addition, throughout the entire duration of the educational intervention, systematic observation of the activities was carried out in order to ensure control of the implementation of the experimental didactic protocol and to monitor its quality.

Phase 1: Familiarisation and motor literacy (Weeks 1–4)

The first phase was dedicated to the introduction of the game of bocce and to the development of basic motor skills

in order to promote familiarisation with materials and rules of the game, and in this phase the focus was mainly placed on inclusion through targeted didactic adaptations aimed at ensuring the participation of all pupils.

Specifically, adaptations of the task, materials, and teaching context were implemented, such as reducing throwing distance, progressively simplifying rules, using high-visibility and facilitating materials, as well as methodological strategies based on motor demonstration, simplified instructions, and peer support. A particular strategy used was visual cueing, which consists of the use of structured visual stimuli to guide the execution of the motor gesture, in order to facilitate task comprehension and reduce cognitive load. The present intervention included the use of this strategy through the teacher's motor demonstrations, modeling, directional visual signals, and spatial indications, which supported students in the correct execution of the throw.

Specifically, the intervention involved, through the game of bocce, the development of basic hand-eye coordination, the acquisition of correct throwing postures, and the promotion of active participation and engagement of all pupils, through specific activities characterized by free short-distance throws, simplified individual games, and guided exercises with teacher demonstration; in this regard, the practical demonstration of the gesture allowed pupils to observe the correct motor sequence and guided repetition facilitated the progressive acquisition of the motor pattern.

Phase 2: Consolidation of motor skills (Weeks 5–8)

The focus of the second phase was the consolidation of fundamental motor skills; in particular, the activities were structured in order to promote improvement in throwing accuracy, force control, and direction. Motor pathways aimed at developing these competences were proposed, and participants worked in rotating heterogeneous pairs, with particular attention to the distribution of students with SEN, in order to observe and promote cooperative interactions, natural peer tutoring, and processes of active inclusion. Specifically, the activities included throws at progressive distances, exercises with targets of different sizes, pair games, and initial forms of structured non-competitive competition. In this phase, peer tutoring was used as a structured inclusive strategy, promoting peer support, including for students with SEN.

Phase 3: Cooperation and structured play (Weeks 9–12)

The third phase was oriented toward the development of cooperative dynamics and the organisation of group play in order to promote peer cooperation, the development of team-game strategies, and increasingly autonomous rule management. Specifically, the activities in this phase included mixed-team games with immediate feedback, game situations with common goals, and rotation of assigned roles such as captain, coordinator, motor gesture observer, and feedback facilitator, which were structured to ensure the active participation of all students, regardless of ability level. The intervention included inclusive adaptations based on task differentiation, simplification of instructions, and enhancement of individual strengths, promoting cooperative dynamics and equitable access to motor and relational success. This approach therefore allowed the promotion of

peer scaffolding processes and observational learning, and in this phase a significant increase in active participation and social interactions was observed.

Phase 4: Generalisation and advanced inclusive play (Weeks 13–16)

In this final phase, the highest level of inclusion, cooperation, and active participation was observed. The activity was dedicated to the generalisation of acquired competences and the strengthening of inclusive dynamics in order to promote the consolidation of motor skills, autonomy in regulated play, always ensuring full participation of all students, including those with SEN. Specifically, the activities included structured bocce matches with full rules, student-led free play, autonomous team management, and cooperative learning situations without continuous direct teacher intervention, in order to foster collaboration among participants and individual autonomy. The program was therefore developed according to a didactic progression of increasing difficulty, moving from simplified individual activities to structured and cooperative game situations, with inclusive adaptations systematically integrated to ensure the active participation of all students, including those with Special Educational Needs (SEN). At the end of the intervention, both groups (experimental and control) were administered the TGMD-3 and PIQ post-tests using standardized procedures identical to those used in the initial assessment phase.

Results

Test of Gross Motor Development-3 (TGMD-3)

In the total TGMD-3 scores, no significant differences were found between the experimental group and the control group at baseline (T0) ($p > 0.05$); this finding suggests a substantial initial homogeneity of the sample ($d = 0.08$).

The experimental group, involved in the inclusive bocce program, showed a progressive improvement in scores from pre-test to follow-up (Table 1), and the analysis of the overall change revealed an average increase of approximately 13.8 points in the experimental group, compared to an increase of 4.1 points in the control group.

Table 1. Mean TGMD-3 scores (Mean $\pm$ SD)

Group	T0 (Pre-test)	T1 (Post-test)	T2 (Follow-up)
Experimental group	52.40 $\pm$ 6.10	63.85 $\pm$ 6.45	66.20 $\pm$ 6.30
Control group	51.90 $\pm$ 6.25	55.10 $\pm$ 6.40	56.05 $\pm$ 6.55

The paired t-test analysis showed a significant increase between T0 and T1 ($t = -8.34$; $p < 0.001$; $d = 1.82$) and between T0 and T2 ($t = -9.12$; $p < 0.001$; $d = 2.23$) in the experimental group, while in the control group a more limited improvement was observed ($t = -2.11$; $p = 0.041$; $d = 0.65$).

Regarding the analysis of the TGMD-3 subdimensions, in the experimental group more evident improvements were recorded in object control skills, with an increase of 24.5%, compared to an improvement of 18.2% observed in locomotor skills. In the control group, instead, the improvements were more limited, with increases of 7.8%

in object control skills and 6.1% in locomotor skills. Finally, at post-intervention (T1), the between-group comparison using independent-samples t-test also showed significant differences in favour of the experimental group ($t = 6.17$; $p < 0.001$; $d = 1.36$), differences which were also confirmed at follow-up ($t = 7.03$; $p < 0.001$; $d = 1.58$).

Perceptions of Inclusion Questionnaire (PIQ)

Regarding perceived inclusion, PIQ scores at baseline (T0) showed comparability between the two groups, as no significant differences were observed ($p > 0.05$).

The PIQ results showed a progressive increase in the experimental group across the three assessment points compared to the control group (Table 2).

Table 2. Mean PIQ scores (Mean $\pm$ SD)

Group	T0 (Pre-test)	T1 (Post-test)	T2 (Follow-up)
Experimental group	3.10 $\pm$ 0.60	4.20 $\pm$ 0.50	4.40 $\pm$ 0.50
Control group	3.00 $\pm$ 0.50	3.20 $\pm$ 0.60	3.40 $\pm$ 0.60

Therefore, the paired t-test analysis showed significant differences in the experimental group between T0 and T1 ($t = -7.02$; $p < 0.001$; $d = 1.99$) and between T0 and T2 ($t = -8.17$; $p < 0.001$; $d = 2.36$), while in the control group the changes did not reach statistical significance ($p > 0.05$) with only a small-to-moderate improvement observed over time (T0–T2: $d = 0.72$). In addition, the between-group comparison using independent-samples t-test revealed significant differences in favour of the experimental group both at post-intervention (T1) ($t = 7.88$; $p < 0.001$; $d = 1.81$) and at follow-up (T2) ($t = 8.26$; $p < 0.001$; $d = 1.81$). Furthermore, the analysis of the individual dimensions of the questionnaire showed the most consistent improvements in participation in activities and sense of belonging to the group, followed by peer relationships and perceived social acceptance.

Structured systematic observation

Throughout the entire intervention period, systematic observation was conducted by two independent observers; inter-observer reliability showed Cohen's Kappa values ranging from 0.82 to 0.91, indicating a high level of agreement between raters. In the experimental group, a progressive increase was observed in active participation, peer interaction, cooperation, and rule compliance over the sessions; these changes were more evident in the second half of the intervention, while in the control group the observed variations were minimal and less systematic.

Discussion

The present study analysed the effects of a 16-week inclusive bocce programme on the development of fundamental motor skills and perceived inclusion among fifth-grade primary school students, including students with Special Educational Needs (SEN). The findings demonstrated significant improvements in the experimental group across both motor competence (TGMD-3) and socio-relational

outcomes (PIQ), which were further supported by systematic behavioural observations. The concurrent enhancement of motor competence and perceived inclusion suggests that the inclusive bocce intervention influenced not only motor performance but also the broader social and relational dimensions of participation, confirming that appropriately designed inclusive physical education programmes can simultaneously promote motor development and meaningful social engagement (Lieberman et al., 2020; Boke et al., 2025). These improvements were accompanied by moderate to large effect sizes, indicating that the observed changes were not only statistically significant but also educationally meaningful. The parallel increase in TGMD-3 and PIQ scores further suggests a close relationship between the development of fundamental motor competence and active social participation. This interpretation is consistent with previous evidence indicating that greater motor competence enhances children's confidence, participation in group activities, and opportunities for positive peer interaction (Ulrich, 2013; Salaj & Masnjak, 2022; İdareci & Yarımka, 2025). Likewise, students who perceive themselves as more competent in motor tasks are generally more willing to engage in collaborative activities, strengthening interpersonal relationships and fostering a stronger sense of belonging within the group, particularly in inclusive educational settings (Haegele & Sutherland, 2015; Lieberman et al., 2020). Consequently, the present findings suggest that the inclusive bocce programme effectively supported both motor learning and social inclusion, creating learning conditions that actively engaged students with SEN alongside their typically developing peers, consistent with current recommendations for inclusive physical education practice (Jariono et al., 2025; Gazali et al., 2025). Regarding the observed improvements in fundamental motor skills, these findings may be explained by the progressive structure of the intervention. The familiarisation phase likely reduced fear of making mistakes, increased task engagement, and facilitated the gradual acquisition of movement skills through an adapted and supportive learning environment, which has been recognised as a key component of successful inclusive motor learning programmes (Lieberman et al., 2020; Jariono et al., 2025).

Therefore, during the initial phase of the programme, exposure to simple, progressively structured, and highly accessible motor tasks likely facilitated the development of basic coordinative prerequisites, particularly locomotor skills and fundamental object-control movements, before advancing to more complex motor tasks (Lieberman et al., 2020; Jariono et al., 2025). Such a progressive instructional approach has been recognised as an effective strategy for stabilising fundamental movement patterns and promoting the transfer of motor skills across different task contexts (Ulrich, 2013). This interpretation is consistent with the present findings, as object-control skills showed the greatest improvement, likely because bocce requires repeated execution of precise throwing actions involving eye-hand coordination, movement accuracy, and force regulation, all of which represent core components assessed by the TGMD-3 (Ulrich, 2013).

Regarding the PIQ results, the significant increase in perceived inclusion observed in the experimental group suggests that the intervention positively influenced students' social participation and sense of belonging within the physical education environment. This finding is consistent with previous research demonstrating that structured, cooperative, and adaptable

learning environments promote meaningful participation of all students, regardless of their abilities, while reducing barriers to inclusion (Holland et al., 2023; Lieberman et al., 2020; Haegele & Sutherland, 2015). The cooperative nature of bocce activities, which encourages shared goal achievement, peer interaction, and mutual support, may have further contributed to these positive social outcomes, in agreement with recent evidence highlighting the educational value of collaborative learning strategies in inclusive physical education (Boke et al., 2025). Furthermore, the cognitive activation associated with regular motor practice may have indirectly supported students with Special Educational Needs by improving attention, behavioural self-regulation, and engagement in learning activities (Latino et al., 2025b). These mechanisms are consistent with contemporary adaptive physical education approaches, which emphasise that appropriately modified motor tasks and inclusive instructional strategies facilitate both educational participation and successful social integration of students with SEN (Jariono et al., 2025; Gazali et al., 2025).

The selection of bocce as the intervention activity was based on its non-invasive, flexible, and easily adaptable characteristics, which make it particularly suitable for inclusive physical education settings. These features likely reduced barriers to participation by enabling students with different levels of motor competence to contribute meaningfully to shared game situations, thereby strengthening their sense of belonging and promoting positive peer interactions (Lieberman et al., 2020; Haegele & Sutherland, 2015; Gazali et al., 2025). Furthermore, the incorporation of team-based activities and cooperative learning tasks created opportunities for peer support, shared responsibility, and reciprocal learning, which are recognised as essential components of effective inclusive pedagogical practice (Boke et al., 2025). Such cooperative experiences may have contributed not only to the development of fundamental motor skills but also to broader educational outcomes, including communication, behavioural self-regulation, respect for rules, and social responsibility, which are considered key objectives of contemporary adaptive physical education programmes for students with Special Educational Needs (Jariono et al., 2025; İdareci & Yarımka, 2025).

These findings may also be interpreted through the perspective of Bandura's (1977) Social Learning Theory, which proposes that motor and social behaviours are acquired through observation, imitation, modelling, and social reinforcement. Within the inclusive bocce programme, students were provided with frequent opportunities to observe peers, imitate successful movement strategies, receive immediate feedback, and learn collaboratively in authentic game situations. Such learning conditions are consistent with contemporary evidence indicating that peer modelling and cooperative interaction enhance both motor learning and social participation in inclusive physical education settings (Lieberman et al., 2020; Boke et al., 2025). Furthermore, the systematic observational data support this interpretation, demonstrating greater cooperation and active participation in the experimental group than in the control group. Pair- and small-group activities likely facilitated reciprocal modelling, shared problem-solving, and mutual encouragement, thereby contributing not only to the acquisition of motor skills but also to the development of cooperative behaviours, communication skills, and positive peer relationships (Haegele & Sutherland, 2015; Boke et al., 2025).

The final generalisation phase enabled students to apply the motor and social competences acquired during the programme more autonomously in increasingly complex and less structured game situations. From an educational perspective, this phase is particularly important because it promotes the consolidation of learned motor patterns and facilitates the transfer of acquired skills to novel and authentic movement contexts (Ulrich, 2013). Gradually reducing instructional support while increasing students' autonomy is consistent with contemporary inclusive pedagogical approaches, which emphasise independent participation and the functional application of acquired competences across different learning environments (Lieberman et al., 2020; Jariono et al., 2025).

During the final generalisation phase, the highest level of perceived inclusion (PIQ) was observed, suggesting that increasing autonomy and active participation strengthened students' sense of belonging within the group. This finding further supports the view that inclusive physical education programmes should progressively empower students to participate independently while maintaining meaningful peer interaction (Haegele & Sutherland, 2015; Lieberman et al., 2020). Particularly noteworthy was the active involvement of students with Special Educational Needs, whose successful participation was facilitated by the methodological adaptations incorporated throughout the programme. These findings are consistent with current evidence indicating that appropriately adapted learning environments enable students with SEN to participate successfully alongside their peers while enhancing both educational and social outcomes (Jariono et al., 2025; Gazali et al., 2025).

Limitations

Despite these encouraging findings, several limitations should be acknowledged. First, the quasi-experimental design and the absence of full randomisation limit the strength of causal inferences. Second, although the statistical analyses adequately addressed the study objectives, the use of a unified longitudinal analytical approach, such as linear mixed models or mixed ANOVA, would have provided a more comprehensive evaluation of changes over time while accounting for within-subject variability. Future studies employing randomised controlled designs, larger samples, and advanced longitudinal statistical models are warranted to confirm and extend the present findings.

Conclusion

The inclusive bocce program proved effective in improving both fundamental motor skills and perceived inclusion in primary school students. The progressive structure of the intervention and the integration of cooperative and inclusive strategies appear to represent key elements for the success of the program, even in the presence of students with SEN. Therefore, the results of the present study support the effectiveness of bocce as an inclusive educational tool within primary school. From a pedagogical perspective, the study highlights how simple yet structured motor activities can represent a privileged context for promoting the development of fundamental motor skills, active participation, and cooperation among students with different ability levels.

Ethics Approval

The study was approved by the Ethics Committee of the University of Naples Parthenope (DiSMMeB, Prot. No. 16716/2026). Written informed consent was obtained from all participants and/or their legal guardians prior to participation in the study.

Data Availability Statement

The data supporting the findings of this study are available from the corresponding author upon reasonable request.

AI Transparency Statement

The authors used AI-assisted tools for language editing only and take full responsibility for the content.

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Conflicts of Interest

The authors declare no conflicts of interest.

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Фізична та спортивна діяльність як засіб інклюзії: вивчення фізіологічних і психосоціальних переваг

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Авторський вклад: А – дизайн дослідження; В – збір даних; С – статаналіз; D – підготовка рукопису; Е – збір коштів

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Мета. Основною метою дослідження було сприяти розвитку базових рухових навичок і соціальної інклюзії в початковій школі шляхом упровадження інклюзивного педагогічного втручання, заснованого на руховій та спортивній діяльності.

Матеріали та методи. Дослідження виконано за квазіекспериментальним дизайном із експериментальною та контрольною групами. У дослідженні взяли участь 80 учнів п'ятих класів початкової школи (40 в експериментальній та 40 у контрольній групі), серед яких було 10 учнів з особливими освітніми потребами (ООП); середній вік учасників становив $10,4 \pm 0,5$ року. Учні експериментальної групи брали участь у структурованому педагогічному втручанні, заснованому на руховій діяльності. Базові рухові навички оцінювали за допомогою тесту TGMD-3, рівень сприйняття інклюзії визначали за опитувальником PIQ, а поведінку учнів під час занять реєстрували шляхом систематичного спостереження. Оцінювання проводили до початку втручання (T0), після його завершення (T1) та під час віддаленого контрольного обстеження (T2).

Результати. Результати засвідчили статистично значуще більші покращення в експериментальній групі порівняно з контрольною за показниками базових рухових навичок, сприйняття інклюзії, активної участі, співпраці та взаємодії з однолітками. Дані систематичного спостереження також підтвердили вищу якість міжособистісної взаємодії в групі, яка брала участь у педагогічному втручанні.

Висновки. Отримані результати свідчать, що структуроване педагогічне втручання, засноване на руховій діяльності, може позитивно впливати як на розвиток рухових компетентностей, так і на інклюзивні процеси в початковій школі, одночасно сприяючи навчанню рухових дій, соціальній участі та освітній інклюзії, зокрема учнів з особливими освітніми потребами.

Ключові слова: інклюзія, базові рухові навички, кооперативне навчання, особливі освітні потреби (ООП).

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