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The Impact of Plyometric Training on Agility, Speed, and Social Interaction in Children with Mild Intellectual Disability: A Special Olympics Framework Study

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Abstract: Aim: This study aimed to evaluate the effectiveness of a plyometric training program designed to enhance agility, speed, and social interaction among boys with mild intellectual disability (ID) aged 10-12, within the Special Olympics framework. Participants: Thirty-two boys (mean age = 10.69 ± 0.8 years; mean IQ = 61 ± 7) from three inclusive education centers participated in the study. Methods: The intervention consisted of a 10-week plyometric training program, conducted twice a week. Pre- and post-intervention assessments included the Reaction Time Test, 4-Corner Agility Test, 10-Meter Speed Run, 4x5 Meter Relay Test, and the Friendship Activity Scale (FAS). Results: The study found significant improvements across all measures. Reaction time decreased by 0.83 seconds ($t = 7.44$, $p < 0.001$), 4-corner agility improved by 0.77 seconds ($t = 11.93$, $p < 0.001$), 4x5 meter speed improved by 0.61 m/s ($t = 17.37$, $p < 0.001$), and 10-meter run speed improved by 1.55 m/s ($t = -12.76$, $p < 0.001$). Additionally, the FAS score increased by 0.81 points ($t = 9.59$, $p < 0.001$), indicating enhanced social interactions. Conclusion: The plyometric training program significantly improved agility, speed, and social interaction in children with mild ID, demonstrating the effectiveness of inclusive, adaptive physical education strategies within the Special Olympics framework.

Keywords: mild intellectual disability; plyometric training; agility development; speed enhancement; inclusive sports programs

1. Introduction

Individuals with Intellectual Disability (ID) face significant challenges in intellectual functioning and adaptive behavior (Tassé et al., 2012). These challenges highlight the importance of robust support systems that can bridge the gap between their abilities and the expectations of their social environments (Marks & Heller, 2003). Such support systems encompass resources and strategies that foster physical fitness, education, personal interests, and overall well-being, thereby enhancing individual functioning (Franco et al., 2023). Inclusive training experiences are essential in preparing students with disabilities for community living (McDonnell & Hardman, 2009), and they emphasize the acceptance of differences among participants as natural aspects of human development (Harris, 2006). Specifically, inclusive training programs tailored to help individuals with ID demonstrate competence and adaptive behavior are of significant interest (Leonte et al., 2014).

Children with mild ID encounter various learning difficulties that affect their educational and social development. These difficulties can arise from genetic conditions, prenatal or perinatal

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complications, or environmental factors. Typically, children with mild ID have an IQ range of 50-70 and exhibit slower cognitive processing, reduced problem-solving skills, and challenges with abstract thinking. They may also experience delays in language development and difficulties with social interactions, making it hard for them to keep pace with their peers in academic and physical activities (Goodey, 2011).

This study focuses on evaluating the impact of a plyometric training program within the Special Olympics framework. The Special Olympics is an international sports training and competition program for individuals with ID, aged eight and older, regardless of their abilities (Chandan & Dubon, 2019). Its mission is to provide year-round sports training and competition in various Olympic-type sports for children and adults with ID (Eidelman, 2011). Various specialists have implemented adapted training programs for children with ID, achieving significant improvements in their physical and social skills (Malekpour et al., 2012; Xu et al., 2020; Ahmedova & Belomazheva-Dimitrova, 2021).

To address the challenges faced by children with mild ID, this study implements a structured plyometric training program designed to enhance agility and speed in children aged 10-12 with mild ID. Additionally, the program aims to strengthen relationships between children with mild ID and their typically developing peers through inclusive activities.

Agility and speed are critical components of physical fitness that significantly impact a child's ability to perform everyday activities and participate in sports (Marin et al., 2023). However, children with mild ID often face difficulties in developing these skills due to physical, cognitive, or sensory limitations. Plyometric training involves exercises that enable muscles to exert maximum force in short intervals, improving power, speed, and agility (Patrascan & Stefanica, 2019; Jouira et al., 2020). These exercises are particularly beneficial for children with mild ID as they can enhance muscle strength, coordination, and neuromuscular efficiency. For these children, plyometric training can be adapted to meet their unique needs, ensuring that the exercises are both accessible and effective (Balayi et al., 2022; Badau et al., 2023).

Agility refers to the ability to move quickly and change direction with ease, while speed pertains to the rapidity of movement. Both skills are essential for physical fitness and are often underdeveloped in children with mild ID. Incorporating plyometric exercises can significantly improve these abilities, helping children perform better in physical activities and sports, and enhancing their overall quality of life (Jouira et al., 2024).

The Special Olympics model emphasizes inclusivity and social integration, providing opportunities for children with mild ID to participate in sports alongside their typically developing peers. This cooperative approach fosters a sense of community, mutual respect, and understanding. By integrating typically developing peers into the training program, we aim to enhance social attributes such as teamwork, communication, and empathy in children with mild ID (Özer et al., 2012).

Partnering with peers in physical activities not only boosts the confidence of children with ID but also promotes a more inclusive environment where all children can thrive. This approach aligns with the principles of the Special Olympics, which advocate for the inclusion of individuals with disabilities in all aspects of life, including sports and physical education (Tint et al., 2019).

This study seeks to fill the gap in physical activity programs specifically designed for children with ID by implementing a targeted plyometric training program.

Hypotheses

H1.We presuppose significant enhancements in overall physical capabilities, particularly in reaction time, agility, and speed, through the implementation of a meticulously tailored plyometric training program for children with mild ID.

H2.We anticipate positive changes in social dynamics, fostering greater inclusivity and improving peer relationships through structured training sessions alongside typically developing peers.

The primary objectives of this research are multifaceted, aiming to enhance the physical abilities and social interactions of children with mild ID. These objectives include:

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1. initial assessment - conduct a comprehensive initial assessment to understand the current levels of agility and speed in the participants. This baseline data is crucial for tailoring the training program to meet the specific needs of each child.
2. program development -develop a plyometric training program based on the primary data obtained from the initial assessment. The program is designed to be engaging, safe, and effective for children with mild ID.
3. final evaluation -perform a final evaluation to assess the progress and changes in agility, speed, and social influence of the participants. This step will help quantify the impact of the training program. Additionally, evaluate the influence of the intervention on social attributes by conducting activities with typically developing peers, in the context of Special Olympics partnerships. This aspect aims to enhance inclusivity and social interaction among children with mild ID and their peers.

2. Materials and Methods

2.1. Research Subjects

The investigation was conducted across three inclusive education school centers, focusing on the diverse needs and abilities of children with mild ID. The study included a total of 32 boys, each carefully selected to ensure the representativeness and relevance of the findings. The demographic details of the participants were as follows: the mean age was 10.69 ± 0.8 years, with an average IQ of 61 ± 7 with an average height of 136.7 ± 6.7 cm, weight of 32.9 ± 7.3 kg, and a body mass index (BMI) of 18.8 kg/m^2.

To distribute the participants, 10 children attended the first institutional center, another 10 children attended the second center, and 12 children were enrolled in the third center. This distribution aimed to encompass a broad spectrum of the mild ID population within the inclusive education framework. These participants were selected in cooperation with the Special Olympics Romania Foundation (Mujea et al., 2019), with assistance from the Ministry of National Education. The plyometric tests and programs implemented by the Special Olympic Romania Foundation are integral to both the development of physical attributes and the identification of athletic talents. These initiatives are specifically designed to prepare teams for participation in the National Unified Football Championship. The focus is on training boys' teams for the 7-a-side football format (Valkova, 2020). A traditional sampling approach was utilized, taking into consideration factors such as age and medical fitness, as confirmed by an individual medical certificate stating "clinically healthy" or "fit for adapted sports activities." Additionally, documentation verifying special educational needs, including a Certificate of educational and vocational guidance or its equivalent, was provided.

Moreover, parental consent was obtained and recorded prior to the start of the study, following the principles outlined in the Declaration of Helsinki. The research protocol received approval from the Ethics Committee of the Doctoral School of Physical Education and Sport Science (ID: 12/23.01.2024), University of Politehnica Bucharest, University Center Pitesti, Romania, ensuring compliance with ethical standards and guidelines for research involving human participants.

2.2. Research Tools

1. Reaction time Test with Witty SEM Intelligent Semaphores

The Witty SEM Intelligent Semaphores were employed to measure the reaction time of the participants. This advanced tool is designed to enhance the assessment of motor skills by providing immediate visual cues that the children must respond to as quickly as possible. Five semaphores are aligned in a row, and the participant stands in front of them at a short distance, allowing them to reach out and touch each one with an outstretched hand. During the test, participants were required to touch the illuminated semaphore as swiftly as they could. This method effectively evaluates their

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reaction time, offering precise and reliable data critical for analyzing the effectiveness of the plyometric training program (Stefanica et al., 2024).

2. 4-Corner Agility Test with Partner

To measure agility, we utilized the 4-Corner Agility Test. This test involves placing four markers in a square pattern, and the participant must move quickly between these points in a specific sequence. A partner stands behind the sensor to encourage the child to complete the test as quickly as possible. The test assesses the ability to change direction rapidly and efficiently, which is a key component of agility. The performance in this test provides valuable insights into the participants' agility levels (Kelly & Williams, 2020).

3. Photocells for 10-Meter Speed Run with Partner

For measuring running speed, photocells were used during the 10-meter speed run test. The photocells ensure high accuracy in timing the sprint from start to finish. Participants were instructed to run as fast as possible over a distance of 10 meters, with a partner acting as a "rabbit" to motivate them to run faster. The time taken to complete this sprint was recorded. This test is essential for evaluating the baseline speed of the children (Zahirović et al., 2023).

4. Photocells for 4 x 5 Metres Relay Test with Partner

The 4 x 5 Metres Relay Test was conducted to further assess the participants' speed and coordination. In this test, participants ran back and forth between two markers set 5 meters apart, completing four legs of the relay. A partner stood behind the sensor to encourage the child to perform the relay as quickly as possible. This test not only measures speed but also evaluates the participants' endurance and ability to perform repeated sprints. The results from this test are critical for understanding the overall athletic development of the children as influenced by the training program (Bond et al., 2017).

4. The Friendship Activity Scale (FAS)

The primary aim of unified sports is to foster positive psycho-social changes through "friendship activity" (Özer et al., 2012). To gauge the effectiveness of unified sports, it is crucial to have a reliable tool that measures these "friendship activities."

The Friendship Activity Scale (FAS) is designed to assess attitudes toward individuals with mild ID who engage in various activities. Originally consisting of 17 items, the scale asks respondents to use a four-point scale to indicate whether they would (4), probably would (3), probably would not (2), or would not (1) include a child with mild ID in a given activity (Vignes et al., 2008).

In our study, we utilized the FAS to examine whether there were significant changes in the attitudes of non-disabled peers (partners) before and after their involvement in the plyometric training program. By analyzing the FAS scores, we aimed to determine if the program influenced the partners' perceptions and attitudes towards children with mild ID. This assessment was essential for evaluating the impact of the plyometric training on promoting social inclusivity and improving peer relationships within the Special Olympics framework.

2.3. Procedure of the Intervention

Stage One: Psychological Records Analysis (February 2024)

In the initial stage of the research, conducted in February 2024, the psychological records of the participants were thoroughly reviewed. These records, maintained by the psychologists at the institutional centers, provided comprehensive insights into the psychological profiles of each subject. The data, collected over the period of their institutionalization, included detailed observations and assessments that were crucial for understanding the baseline mental and emotional state of the participants.

Stage Two: Agility and Speed Testing (March 2024)

The second stage, carried out in March 2024, involved subjecting the participants to a series of tests designed to gather specific information on their agility and speed skills. These tests were

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meticulously chosen to evaluate the key components of physical performance that the plyometric training program aimed to enhance. The data obtained from these tests offered valuable benchmarks for assessing the initial capabilities of the participants. Additionally, the initial completion of the FAS questionnaire by the partners of children with mild ID was included in this stage. This questionnaire provided critical insights into the social and adaptive functioning of the children, which is crucial for understanding the broader impact of the training program on their overall development.

Following this preliminary research phase, the collected data was processed and analyzed. The insights gained from this analysis were instrumental in selecting the appropriate plyometric tools and designing the action plans for the plyometric training program. This careful selection process ensured that the program was tailored to meet the specific needs of the participants.

Stage Three: Implementation of the Plyometric Training Program (March 2024 to May 2024)

In the third stage, the participants were organized into an experimental group and introduced to an adaptive plyometric training program. This program consisted of 20 sessions, each structured into three parts, conducted twice a week for 45 minutes per session from March 2024 to May 2024. The training sessions were designed to progressively enhance the agility and speed skills of the participants, incorporating a variety of plyometric exercises tailored to their individual abilities and needs.

2.4. Plyometric Training Program for Agility and Speed Development for Children with Mild ID

This program aims to enhance the agility and speed of children with special mild ID through plyometric training. It is designed to be inclusive, involving typically developing peers as partners in the exercises, promoting cooperation, social interaction, and mutual support. The structure and activities draw from successful interventions documented in the literature, particularly focusing on enhancing psychomotor skills.

Program objectives:

1.improve agility and speed - develop quickness and coordination through plyometric exercises.

2.promote social interaction - foster teamwork and social skills by pairing mild ID children with typically developing peers.

3.enhance confidence and motivation -build self-esteem and enjoyment in physical activity.

Program structure:

1.duration -10 weeks;

2.sessions -2 times per week;

3.session lenght -45 minutes.

Partner Interaction:

1.pairing -each mild ID child is paired with a typically developing peer.

2.role of partners -peers provide encouragement, help demonstrate exercises, and ensure the correct form.

3.activities -partner-assisted drills, where one child performs the exercise while the other counts repetitions and offers support.

Simplified instructions: clear, concise, and repeated as necessary.

Visual aids -use of pictures and demonstration to illustrate exercises.

Positive reinforcement -regular encouragement and praise to boost confidence.

Sensory considerations -ensure the environment is suitable for children with sensory processing issues (e.g., reduced noise, clear spaces).

Safety and inclusion:

1.ensure all equipment is safe and appropriate for the age group.

2.create an inclusive environment where all children feel valued and supported.

3.supervise closely to provide assistance and prevent injury.

This program leverages the principles of plyometric training while adapting to the unique needs of children with mild ID. It emphasizes cooperation, social interaction, and mutual support, aligning with the values promoted by the Special Olympics. By incorporating typically developing peers, the

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program not only aims to improve physical abilities but also fosters an inclusive and supportive community.

Table 1 provides a comprehensive weekly session outline for a plyometric training program aimed at enhancing agility and speed in children with mild ID.

Table 1. Plyometric training program for enhancing agility and speed in children with mild ID.

Weekly session outline	
Part	Description
Warm-up (10 minutes)	- Light Jogging - gentle jogging around the play area to increase heart rate and prepare muscles. -Dynamic stretching - leg swings, arm circles, and torso twists to enhance flexibility and range of motion. -Simple coordination drills - activities like marching on the spot and skipping to improve coordination and motor skills.
Main plyometric activities (30 minutes)	
Activity 1:Jumping Jacks (5 minutes)	Objective : Enhance cardiovascular fitness and coordination. Instructions: Perform 3 sets of 15 jumping jacks with 1-minute rest between sets.
Activity 2: Lateral Hops (5 minutes)	Objective : Improve lateral agility and balance. Instructions : Perform 3 sets of 10 hops to each side, rest for 1 minute between sets.
Activity 3: Reaction to visual stimuli drills (10 minutes)	Objective : Develop quick directional changes, speed, and reaction time. Instructions: Simple visual stimulus reaction -children react to a signal by running 5 meters back and forth. Perform 2 sets of 4 reps, increasing to 4 sets of 5 reps by the tenth week. Bidirectional movements with color stimuli -children react to random color signals and perform shuttle runs to the indicated marker. Start with 2 sets of 4 reps, progressing to 4 sets of 5 reps. Multidirectional movements with directional cues -children react to visual directional cues, performing shuttle runs to indicated markers. Begin with 2 sets of 4 reps, advancing to 4 sets of 5 reps.
Activity 4: Box Jumps (10 minutes)	Objective: Increase explosive leg power and coordination. Instructions: Using a stable platform, children jump onto and off the box, focusing on soft landings. Perform 3 sets of 8 jumps, rest for 2 minutes between sets.
Cool down (5 minutes)	- Static stretching - stretch hamstrings, quadriceps, calves, and shoulders to promote flexibility and prevent injury. Breathing exercises - deep breathing exercises to relax and cool down the body.

2.5. Statistical Analysis

Stage Four: Comparative Analysis (June 2024)

The fourth stage of the research, conducted in June 2024, focused on a comprehensive statistical-mathematical analysis aimed at comparing the results from the initial and final assessments. This stage was critical in determining the effectiveness of the plyometric training program.

The statistical test used in this research is the paired t-test, which compares the means of two related groups to determine if there is a statistically significant difference between them (Hedberg & Ayers, 2015). In this study, the paired t-test was employed to assess the impact of the 10-week plyometric training program on agility, speed, and the Friendship Activity Scale (FAS) score.

The statistical analysis conducted involved calculating the mean (M) and standard deviation (SD) of the differences between the initial and final measurements for each variable. The t-value represents the magnitude of the difference relative to the variability in the data. The significance level (Sig. or p-value) of the paired t-test indicates whether the observed differences are statistically significant. The paired t-test was employed for statistical analysis using SPSS, version 23.0.

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All p-values in Table 2 are less than 0.001, indicating that the observed differences in reaction time, agility, speed, and FAS score are statistically significant. This suggests that the plyometric training program had a significant impact on these variables, enhancing agility, speed, and social interaction among the participants.

3. Results

Table 2 summarizes the statistical analysis of the initial and final test results for agility and speed measurements, detailing the mean differences (M), standard deviations (SD), t-values (t), and significance levels (Sig. (2 tailed)) for each measurement.

Table 2. The effect of the 10-week plyometric training program on agility, speed, and FAS score.

Measurements	Test	M	SD	t	Sig. (2 tailed)	p
Reaction time	I	0.83250	0.83277	7.43804	.000	$p < 0.001$
	F					
4 corners agility	I	0.76859	0.38998	11.9274	.000	$p < 0.001$
	F					
4x5m	I	0.61406	0.20323	17.3727	.000	$p < 0.001$
	F					
10m run speed	I	-1.55344	0.77701	-12.7635	.000	$p < 0.001$
	F					
FAS score	I	0.81031	0.57572	9.59399	.000	$p < 0.001$
	F					

Abbreviations: M: Represents the difference between the initial mean and the final mean. SD: Represents the standard deviation of the differences. t: The t-value of the paired t-test. Sig. (2 tailed) and p: The p-value of the paired t-test, indicating statistical significance. All p-values are less than 0.001, indicating that all differences are statistically significant.

Reaction time: The mean difference is 0.83, with a t-value of 7.44 and a p-value < 0.001. This difference is statistically significant.

4 corners agility: The mean difference is 0.77, with a t-value of 11.93 and a p-value < 0.001. This difference is statistically significant.

4x5m: The mean difference is 0.61, with a t-value of 17.37 and a p-value < 0.001. This difference is statistically significant.

10m run speed: The mean difference is -1.55, with a t-value of -12.76 and a p-value < 0.001. This difference is statistically significant.

FAS score: The mean difference is 0.81, with a t-value of 9.59 and a p-value < 0.001. This difference is statistically significant.

4. Discussion

This study seeks to fill the gap in physical activity programs specifically designed for children with ID by implementing a targeted plyometric training program. The primary objectives are to enhance both the physical abilities and social interactions of children with mild ID. The research focuses on understanding the initial levels of agility and speed in participants, developing an engaging and safe plyometric training program based on initial assessments, and evaluating the progress and social influence on the participants. The results from this study indicate significant improvements in several key areas. Reaction time, agility, and speed showed marked enhancement following the 10-week plyometric training program. Additionally, the Friendship Activity Scale (FAS) scores demonstrated significant positive changes, indicating better social interactions and inclusivity among the participants and their typically developing peers.

Reaction Time

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The reaction time of participants decreased notably, suggesting improved neuromuscular response and coordination. This improvement is critical for everyday activities and sports performance, highlighting the effectiveness of the plyometric exercises in enhancing quick reflexes and overall reaction speed.

Agility

Participants showed substantial improvements in agility, as evidenced by the reduction in times recorded for the 4-corner agility test and the 4x5 meter relay. Enhanced agility is essential for better motor skills and quick directional changes, which are beneficial in both sports and daily activities. The pairing of children with typically developing peers likely contributed to this improvement through encouragement and modeling.

Speed

The participants' speed also improved significantly, both in the 10-meter run and the 4x5 meter relay tests. Improved speed is an indicator of better muscular power and endurance, critical for various physical activities and sports. The use of photocells for precise measurement and the motivating presence of partners likely played a role in these enhancements.

Social Interaction

The FAS scores indicated a positive shift in the social attitudes of typically developing peers towards children with mild ID. This suggests that the plyometric training program not only enhanced physical abilities but also fostered social inclusivity and improved peer relationships. The structured interaction and mutual support during exercises likely facilitated these positive changes.

The results of this study support the hypothesis that a well-structured plyometric training program can significantly enhance the physical and social abilities of children with mild ID. The improvements in reaction time, agility, speed, and social interaction highlight the program's effectiveness. These findings underscore the importance of incorporating physical training programs that are inclusive and tailored to the needs of children with mild ID.

The integration of typically developing peers as partners in these programs promotes inclusivity and mutual support, benefiting all participants. Such programs not only enhance physical abilities but also foster a sense of community and improve the social fabric within inclusive educational settings. The findings suggest that implementing similar programs in other settings could yield substantial benefits, improving the overall well-being and social integration of children with mild ID.

Previous research has shown similar benefits of physical activity programs for children with ID. For instance, study by Kurtoğlu et al. (2022) explored the effects of an 8-week plyometric exercise program on physical and motor skills in 24 students aged 11-17 with moderate to mild intellectual disabilities. Participants completed the exercises three times a week. The results showed significant improvements in height, weight, vertical jump, sit and reach, handgrip strength, shuttle test, leg strength, and back strength. However, no significant changes were observed in body circumference measurements and BMI. Overall, the plyometric exercises positively impacted the physical and motor characteristics of the participants. Jouira et al. (2024) examined the impact of combining balance, plyometric, and strength (CBPS) training with sprint training on physical performance in male athletes with ID. Twenty-seven participants were divided into a CBPS group and a control group that continued regular sprint training. Pre- and post-training tests measured balance, jumping, agility, and sprinting ability. The CBPS group showed significant improvements in one-leg stance, crossover-hop jump, squat jump, countermovement jump, and 10- and 30-meter sprints. The study concludes that CBPS training enhances physical performance in these athletes, indicating the benefits of tailored training programs for their physical fitness and health. Stefanica et al. (2024) investigated personalized psychomotor programs, including adapted football, for children with ID. Over 36 weeks, 12 participants showed significant improvements in balance and social interaction. Statistical analysis confirmed the program's efficacy, highlighting the interconnectedness of physical fitness and social engagement. The study advocates for inclusive activities to enhance the well-being of adolescents with ID, contributing to holistic development and social inclusion efforts. Golubović et al. (2012) examined the impact of tailored physical exercise programs on the physical fitness of children with ID. Assessing 42 ID children and 45 typically developing peers using the Eurofit Test

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Battery, they found that despite participation in exercise programs, ID children scored lower on fitness tests than their peers. The study also noted a correlation between the level of intellectual functioning and physical fitness, highlighting better endurance and balance skills in borderline ID children compared to those with mild ID.

Rosu et al. (2023) developed a structured program aimed at enhancing psychomotor abilities, particularly focusing on balance and motor-cognitive skills in 28 students aged 12-14 from two institutional centers in Romania. The 36-week program comprised biweekly 30-minute sessions. Assessments of psychomotor skills, including balance, movement speed, and upper limb motor laterality, were conducted before and after the program. Statistical analysis revealed significant improvements in movement speed and stimulus identification, with reduced processing time. However, the program did not yield significant changes in dynamic balance.

5. Limitations and Strengths

The study, while valuable, had limitations. Firstly, the sample size was relatively small, consisting of 32 boys, which may limit the generalizability of the findings. Additionally, despite efforts to ensure diversity in participant selection across three inclusive education school centers, the sample might not fully represent the entire spectrum of children with mild ID. While advanced measurement tools were utilized, such as the Witty SEM Intelligent Semaphores and photocells, there might still be limitations in capturing subtle changes in agility, speed, and reaction time. Moreover, the 10-week duration of the plyometric training program might not have been sufficient to observe long-term effects on physical and social development. Lastly, while partnering with typically developing peers was a strength, it might introduce variability in outcomes based on the quality of interaction and support provided by the partners.

On the positive side, the study benefited from a collaborative approach with the Special Olympics Romania Foundation and the Ministry of National Education, ensuring the inclusion of children with mild ID in a supportive environment. Ethical standards were upheld throughout the study, with parental consent obtained and adherence to principles outlined in the Declaration of Helsinki. The comprehensive assessment, which included a range of measurement tools and statistical analyses like paired t-tests, provided a holistic evaluation of physical and social aspects. Additionally, the structured plyometric training program was carefully designed to be engaging, safe, and effective, considering the unique needs of children with mild ID.

Overall, while the study demonstrated significant improvements in physical abilities and social interactions among children with mild ID, it's essential to interpret the findings while considering the outlined limitations. Future research with larger samples, longer intervention durations, and refined measurement tools could further enhance our understanding of tailored physical activity programs for children with ID.

6. Conclusions

In conclusion, this study aimed to address the lack of tailored physical activity programs for children with ID by implementing a targeted plyometric training program. The primary objectives included initial assessment, program development, and final evaluation to enhance physical abilities and social interactions among children with mild ID. The results indicate significant improvements in reaction time, agility, speed, and social interaction following the 10-week plyometric training program. These enhancements are crucial for daily activities and sports performance, highlighting the effectiveness of the program. Additionally, the positive shift in social attitudes among typically developing peers suggests improved inclusivity and peer relationships. Overall, the findings support the hypothesis that a well-structured plyometric training program can significantly benefit children with mild ID, emphasizing the importance of tailored physical activity programs for inclusive development.

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Institutional Review Board Statement: The study was conducted in accordance with the Decla-ration of Helsinki, and approved by the Institutional Review Board (or Ethics Committee) of Doctoral School of Physical Education and Sport Science of University of Politehnica Bucharest, University Center Pitesti, Romania. Prior to registration, all participants were provided with comprehensive information regarding the study's objectives, methodologies, potential hazards, and advantages.

Informed Consent Statement: All individual subjects included in the study provided written in-formed permission. The University Professional Ethics and Deontology Commission within the University of Politehnica Bucharest, University Center Pitesti, Romania noted the following:

- the authors requested the consent of the subjects involved in the research before carrying out any procedures;
- the authors have evidence regarding the freely expressed consent of the subjects regarding their participation in the study;
- the authors take responsibility for observing the ethical norms in scientific research, according to the legislation and regulations in force.

Conflicts of Interest: The authors of this manuscript declare that they have no affiliations or in-volvement with any organization or entity that has a financial interest or non-financial interest in the subject matter or materials discussed. Financial interests include honoraria, educational grants, participation in speakers' bureaus, membership, employment, consultancies, stock ownership, eq-uity interest, expert testimony, or patent-licensing arrangements. Non-financial interests include personal or professional relationships, affiliations, knowledge, or beliefs.

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