Effects of Physical Education on students with intellectual disabilities. A systematic review

Efectos de la Educación Física en alumnado con discapacidad intelectual. Una revisión sistemática

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Abstract

The potential of physical activity and sport for children and young people has been extensively researched, but we need to make an effort to analyse the current situation in the attention to diversity. This literature review analyses 22 scientific papers published in the last decade using the PRISMA method. The results allow us to analyse the identification, methodological and content variables and to conclude that all the interventions carried out produced different types of benefits: physical, emotional, cognitive, social, health and also in the development of values. In addition, there were also benefits in terms of students' attitudes towards inclusion. Analysis of these results will be key to designing future interventions based on scientific evidence. We must not forget that Physical Education is a subject for all students and everyone has the right to be there, to participate and to learn.

Key words: Physical education, intellectual disability, inclusion, review.

Resumen

Las potencialidades de la actividad física y el deporte en niños y adolescentes es un tema altamente estudiado, pero es necesario dedicar esfuerzos a analizar la situación en la atención a la diversidad. En este trabajo de revisión de la literatura se analizan 22 artículos científicos, publicados en la última década, siguiendo el método PRISMA. Este análisis permite conocer las variables identificativas, metodológicas y de contenido y concluir que todas las intervenciones realizadas produjeron diferentes tipos de beneficios: físicos, emocionales, cognitivos, sociales, de salud y desarrollo de valores. Así, también se produjeron beneficios en las actitudes hacia la inclusión del alumnado. El análisis de estos resultados será clave en el diseño de intervenciones futuras, basadas en la evidencia científica. Pues no hay que olvidar que la Educación Física es una materia con entidad propia y que todos y todas tienen derecho a estar, participar y aprender.

Palabras clave: Educación física, discapacidad intelectual, inclusión, revisión.

Introduction

Intellectual disability (ID) is a neurodevelopmental disorder found in the Intellectual Disabilities subcategory of the American Psychiatric Association's DSM-5 manual (APA, 2013). It is characterised by significant limitations in both intellectual functioning and adaptive behaviour (in conceptual, social and practical domains), with varying degrees of severity: mild, moderate, severe, or profound, and beginning early in development.

Beyond the reductionist perspective of the intelligence quotient (IQ) and the ranges used to determine severity, ID involves a mismatch between the person's abilities and the demands of the context (Sales & Trejo, 2019), which affects their functionality and, consequently, their autonomy.

Despite the significant heterogeneity in terms of severity, comorbidity or the way it manifests, people with ID have a neurodevelopmental impairment that affects all domains: motor, sensory, basic and executive cognitive processes, and social and emotional behaviour.

Therefore, people with ID often have limitations in their intellectual abilities (reasoning, understanding, planning, learning from experience), conceptual adaptive behaviour (language, reading, writing), social relations (interpersonal and social skills), and practical (activities of daily living) limitations in their health care and participation in all contexts.

Many of these limitations may be interrelated. For example, low levels of motor development or motor skills can lead to obesity or other diseases, a refusal to exercise and/or low self-esteem (Hortal-Quesada & Sanchis-Sanchis, 2022).

In this sense, Physical Education during the school years can have developmental benefits beyond basic motor skills if we move away from deficit-based approaches. The subject focuses on motor skills, but also includes hygiene and health habits, which are closely linked to self-awareness and personal autonomy, learned through movement, through practice for practice. Through different games, tasks and activities, the development of a balanced concept of self-awareness and self-esteem, decision-making strategies, learning values, emotional regulation and other disciplinary skills can be promoted (Marín-Suelves & Ramón-Llin, 2021).

Therefore, in order to ensure access to the curriculum and learning for people with ID in school settings, these limitations need to be compensated for by providing sufficient individual support at the right intensity for each situation, or by going a step further and designing instruction with everyone in mind. This means that the school context must be inclusive and generate good teaching practices, such as programming based on Universal Design for Learning (UDL), the use of assistive technologies, and the necessary modifications to the environment (Sales & Trejo, 2019).

However, a decade ago, the educational context of PE was not as adapted as it should have been. This was due to factors such as a lack of resources, insufficient professional training, a lack of standard criteria, and teachers' attitudes towards diversity (depending on previous experience) and their sense of self-efficacy (Hernández et al., 2011).

The aims of this review are 1) to describe the interventions carried out in the last decade, 2) to analyse the strategies, measures and resources used by professionals, 3) to identify the benefits of Physical Education for students with ID, 4) to extract the key elements from the scientific evidence to make Physical Education truly inclusive, and 5) to discover reference authors, documents and sources that can guide better future actions.

Methodology

This literature review was based on the PRISMA method (Page et al., 2021) and used the Scopus database due to its recognised prestige and the number of documents it contains (Hernández et al., 2016). Keywords were combined with Boolean operators: ["Educación física" AND "Discapacidad intelectual"] for the search in Spanish and ["Physical education" AND "Intellectual disability"] for the search in English. Table 1 shows the inclusion and exclusion criteria used to select the documents that were finally included in the analysis.

Table 1. Inclusion and exclusion criteria for document selection

Criteria Variables	Inclusion	Exclusion
Document type	Intervention papers	Review papers, chapters, books, dissertations and conference proceedings
Date of publication	2013–2022	
Participants	Students of any age with intellectual disabilities	Teachers, family members and students with or without other special educational needs
Language	No filters	
Availability	Full text in open access	Paid access No access to full text

Figure 1 shows the process of document selection. In the first phase, the keyword search yielded 130 documents containing the terms in the title, abstract or keywords. A total of 18 documents were removed because they were not papers and 33 because they had not been published in the last ten years. The screening was based on 79 papers, of which 44 were removed because they were not open access. Of the 35 full texts evaluated, 13 were discarded based on the criteria outlined above. Finally, 22 papers were included in the analysis.

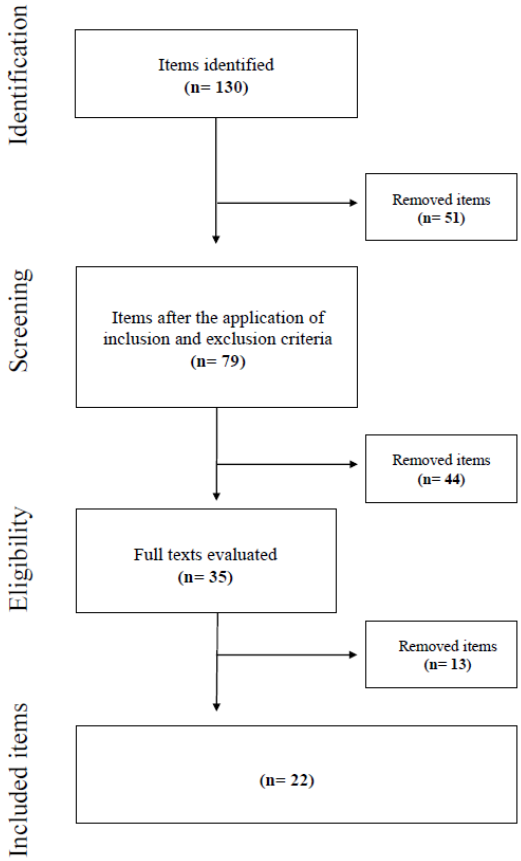

Figure 1. Document selection flow chart

The three authors were involved in this process, and potential bias was reduced by clearly defining and agreeing on the inclusion and exclusion criteria to be applied, and by analysing the papers individually before and then discussing them to make a decision.

The following variables were included in the content analysis (Table 2).

Table 2. Variables analysed

Type	Variables	Description
Identification	Year Author Journal Language	Date of publication Authors Publication Language
Methodology	Context Design and instrumentation Sample	Location, type of centre and scope Research approach and data collection instrument Educational stage, age, sex and quantity
Content	Goals Content Results	Objectives pursued Intervention programme activities Research findings

Results

The following table presents the main results of the variables mentioned in each of the 22 papers analysed.

Table 3. Results of the studies analysed (in order of most recent to least recent publication)

Identification		Methodology		Content	
Author, date, journal and language	Context	Design and instrumentation	Sample	Objectives and content	Findings
Fernandes et al., 2022 *Heliyon* (Q1) English	South Africa Special education school	Quasi-experimental IG: 30 minutes, 3 times a week for a period of 6 weeks. CG: Physical Education lessons. BOT-2 short form.	N = 46 Age: 15–17 yo. 63.1% boys, 36.9% girls. Diagnosis: Moderate to severe ID. Randomly divided into two groups: intervention (IG) and control (CG).	Studying the impact of an intervention programme on motor competence. 18 sessions of 30 min (in 6 weeks). They worked on motor skills (locomotion, manipulation and stability).	Significant improvement in the total scores and motor competence levels of the intervention group. An impact on the performance of daily activities and participation in Physical Education or physical and sports activities was observed, as well as the participants enjoyment of the programme's activities; the risk of obesity was reduced.
Agarwal et al., 2021 *Journal of Autism and Developmental Disorders* (Q1) English	South Florida Post-secondary education programme at public universities	Qualitative Structured interview with 22 questions to parents. Deductive thematic analysis.	Post-secondary Age: 18–24 yo. 2% in full inclusion contexts.	Improving quality of life through academic achievement, employment, and independent living. Programme based on the COM-B model, with special Olympics. Physical and psychological training.	Improved reading and writing abilities. Increased autonomy in task completion. Growth in skills related to cooking, cleaning, personal care, time management, and use of public transport. Improved verbal and interviewing skills. Improved communication and socialisation skills through inclusion. Increased maturity, confidence, responsibility and self-advocacy. Increased participation in campus and community clubs and activities.
Hansen et al., 2021 *Sport, Education and Society* (Q1) English	Sweden Specific Special Education Classrooms in Secondary Schools	Qualitative Semi-structured interview	N = 12 5 boys, 6 girls Age: 16–20 yo. Diagnosis: Moderate ID	Identifying the perception of and motivation towards physical activity of adolescents with ID. Activity, environment, and body and health awareness.	Social support is key to intrinsic motivation towards physical activity and sport for people with ID. They are aware of their limitations and express fear of being excluded.
Priyono et al., 2021 *International Journal of Human Movement and Sports Sciences* (Q3) English	Indonesia Specific Special Education Centre.	Quasi-experimental Pretest-posttest Motor Ability Test (agility, coordination, balance, speed)	N = 28 Diagnosis: Moderate ID	Determining the effect of sports games on the gross motor skills of students with ID. Motor skills test: Agility Coordination Balance Speed	Participation in sports games has an effect on health, cognitive, social, emotional and motor skills.
Wu et al., 2021 *International Journal of Environmental Research and Public Health* (Q2) English	Taiwan 3rd year of a Special Education Centre in Kaohsiung	Qualitative-quantitative Instruments: -Step Test Protocol -Borg rating of students' perceived exertion -Observation records, field diary, photo and video.	N = 10 4 girls, 6 boys Age: 18–19 yo. Diagnosis: Moderate (N = 3), Severe (N = 6), Profound (N = 1) ID	Analysing physical changes in body posture (static and walking) and step frequency. Step programme for 14 sessions in the school curriculum.	Significant improvements in stability and speed, as well as in motivation, interpersonal relationships, and autonomy in activities of daily living.

Cañadas & Calle-Molina, 2020 *Siglo cero* (Q3) Spanish	Madrid Promentor Programme: Training for employment inclusion at the Autonomous University of Madrid.	Qualitative_ MAXQDA (v.20) Service-learning methodology Post-intervention learning diaries and assemblies.	N = 34 University students Diagnosis: ID 16 girls, 18 boys.	Identifying learning outcomes after a specific PE programme and the participants' perception of its effect on interpersonal relationships.	Evidence of learning in: Water rescue, hockey and gymnastic skills (curricular), teamwork and civic behaviour (cross-curricular), and water rescue and first aid (daily life). Positive assessment of the relationship with students.
Carvalho et al., 2020 *Movimento* (Q3) Portuguese	Vitoria Pedagogical practice project of adapted physical education for people with disabilities.	Qualitative: Action research Videos and field diary Evaluation meetings	N = 20 Age: 16–60 Diagnosis: ID and ASD	Analysing language manifestations through Hip Hop for the social recognition of people with ID and ASD. Implementation of a 32-session Hip Hop programme (1 session per week).	Body language (Hip Hop) favours social inclusion by providing moments of social recognition, protagonism and participation.
Furrer et al., 2020 *Frontiers in Education* (Q2) English	Switzerland 112 inclusive classrooms National Foundation project SoPariS	Quantitative Applying and comparing strategies: cooperative skills and guidance by individual reference standards. Questionnaires: PE teachers and students.	Students N = 1744 Age: 6–14 yo. Teachers N = 110	Studying the relationship between educational strategies used in Physical Education and social inclusion, social relations, and participation.	Strategies related to cooperative skills had significant positive results only in social acceptance. Individual reference norm orientation strategies were significant in social acceptance and interaction (increased social participation).
Jang, 2020 *Exercise Science* (Q4) Korean	Korea Special education school	Experimental Questionnaire for children, parents and teachers. CG (N = 10): PE programme IG (N = 10): Dance programme	N = 20 Diagnosis: Moderate ID	Analysing the perception of self-efficacy in children with ID who participate in an integrated art-integrated movement programme. 40-minute dance sessions, twice a week for 12 weeks.	The dance programme increased perceived self-efficacy in self-confidence, self-regulation and preference for task difficulty.
Krutsevich et al., 2020 *Journal of Physical Education and Sport* (Q3) English	Ukraine Smilyan Orphanage of Cherkasy	Experimental CG (N = 22) IG (N = 18) IG: 10 months under the specific programme.	N = 40 Diagnosis: Moderate ID_ oligophrenia	Analysing the emotional state and cognitive functions of children with ID during outdoor games.	Outdoor movement activities including nature activities, sports, orientation, self-care, mood coordination, and cognitive stimulation games have an impact on the psycho-emotional and physical state of children with ID in the IG.
Xu et al., 2020 *BioMed Research International* (Q2) English	China 2 Schools in Beijing	Experimental Pretest-posttest evaluation CG (N = 10) IG (N = 12) IG under the adapted rhythmic gymnastics programme	N = 22 Diagnosis: DS (N = 3) ASD (N = 4) ID (N = 5)	Testing the effects of the adapted rhythmic gymnastics programme on the physical fitness of children with neurodevelopmental disorders (DS, ASD, ID). Stimulation of motor and cognitive skills with 3 weekly sessions of 50' during 16 weeks.	Substantial IG improvement in abdominal strength, muscle strength, upper limb strength, and flexibility

Muñoz et al., 2020 *Retos. Nuevas tendencias en Educación Física, Deportes y Recreación* (Q3) Spanish	Vitoria Francisco de Vitoria University Gil Gayarre Foundation	Qualitative	N = 37 university students N =14 children with moderate ID diagnosis	Offering an inclusive educational experience to university students related to social relations, self-awareness, and the elimination of barriers, and analysing its impact. 9 sessions of 90 minutes with cooperative body language group activities. Activities/RolePlay/ Debate	The experience had significant positive results on self-awareness in children with ID. Increased self-awareness among university students, who rated the experience positively.
Erofeeva et al., 2019 *Electronic Journal of General Medicine* (Q3) English	General education special school	Quantitative Intervention Tests for Flexibility Jump Agility Speed	50 children between 7 and 11 with mild or moderate intellectual disabilities.	Analysing the effects of sports activities and additional Physical Education for the therapy of psychophysiological disorders and physical qualities. 5-year intervention. Badminton 40 minutes, 3 times a week	Development of motor skills by increasing the adaptive capacity of the body, especially in children with mild disability. Flexibility improved from the age of 10. Speed improved more in the disabled groups up to the age of 11. Agility normalised around the age of 9.
Sit et al., 2019 *International Journal of Environmental Research and Public Health* (Q2) English	Special education schools Hong Kong (China)	Quantitative Use of accelerometers in PE classes, at recess, and at lunchtime: Physical Activity Sedentary Time	270 children (108 girls and 162 boys) from 13 centres with 5 types of disability (visual, hearing, physical, intellectual, and socialisation problems).	Analysing the amount of physical activity and sedentary behaviour in students with disabilities at different points of the school year. 6 sessions during a school year (3 in summer and 3 in winter).	Students spent between 15 and 18 minutes a day doing moderate vigorous activity. They were more physically active during the winter and, in order from most to least active, in PE lessons, then at recess and finally at lunch.
Abellán et al., 2018 *RICYDE. Revista Internacional de Ciencias del Deporte* (Q3) Spanish	Castilla–La Mancha Secondary education schools Occupational centre	Experimental Two-stage (pre-post) rating scales of attitudes towards inclusion. CG_no activity EG1_complete programme EG2_visits programme	N = 83 secondary school students 40 boys, 43 girls	Examining the effect of an inclusive sports programme and of direct contact with people with ID on attitudes towards disability among secondary school students. Sports activities and visits to occupational centre facilities.	Sharing experiences and sports with people with ID significantly improved attitudes towards disability. Direct contact can overcome prejudice towards socially excluded groups.
Gobbi et al., 2018 *Journal of Applied Research in Intellectual Disabilities* (Q1) English	High school students	Intervention: 2 groups: PE with peer tutoring and school PE. Physical activity level (accelerometer). Enjoyment and effort questionnaire.	23 adolescents (15 boys and 8 girls) with mild or moderate intellectual disabilities.	Analysing the effect of two types of Physical Education intervention in adolescents. 3 peer-tutored PE sessions. 3 school PE sessions.	The peer-tutoring intervention provided more enjoyment, involved more perceived effort, and led to more time in light intensity than the intervention without peer tutoring.

Kao & Wang, 2018 *International Journal of Developmental Disabilities* (Q3) English	Special school in Taipei	Quantitative Effect on upper limb weight-bearing capacity, grip strength, and hand-eye coordination.	10 students (boys) aged 17–18 with moderate to severe intellectual disabilities.	Analysing the effect of an intervention with a Frisbee game on upper limb skills in young people with ID. 24 sessions (4 per week for 6 weeks) of 40 minutes.	The intervention improved muscle strength, grip strength, coordination, and dexterity.
Vilchez et al., 2018 *Revista Complutense de Educación* (Q2) Spanish	Murcia Associations of people with ID Fundown and CEOM Quialification: Social and Labour Inclusion Training for People with ID	Quasi-experimental Use of the Moral Competence Test in two stages (pre-post) CG (N = 12) EG (N = 11) EG_Application of a physical activity sports programme with discussion of real moral dilemmas in sport activities.	Students from the 1st and 2nd year of the degree N = 23 Diagnosis: ID, 33% disability Average age = 26	Increasing the moral development of people with ID through the discussion of moral dilemmas in sporting activities. 12 one-hour sessions of sports activities: volleyball, handball, badminton, and acrosport.	The results showed an improvement in the moral reasoning of programme participants in terms of commitment, respect, and honesty, but it was not significant.
Ferreira & Munster, 2017 *Relato de Pesquisa* Portuguese	Brazil Special education school	Quasi-experimental Two-stage social skills assessment (pre-post)	Children n = 7 Age: 7–14 yo. Diagnosis: ID	Assessing the impact of the Physical Education Programme on the social skills of students with ID. 24 sessions (40 minute each) of dance, circus, cooperative games, sports, and values of sports/ martial activities.	The programme led to a significant improvement of responsibility, self-control, and overall social skills.
Hsu, 2016 *Journal of Physical Therapy Science* (Q2) English	Educational sphere. Taiwan University	Quantitative Experimental intervention in 3 groups: Intervention using Wii Fit PE Group Sedentary group (control) Measuring: Static balance Dynamic balance Explosive leg strength	24 students with (mild) intellectual disabilities Age: 17–18 yo.	Evaluating an intervention to improve balance skills in students with ID. 16 sessions (40 minutes each) using the Wii Fit balance board during 8 weeks (2 sessions per week).	The results showed that students in the PE and Wii Fit group improved explosive leg strength, but only the Wii group improved their static balance test scores.
Montesano, 2014 *Journal of Physical Education and Sport* (Q3) English	Naples (Italy) Paralympic athletes	Quantitative 2 types of Interventions: PE and PE + football drills Basis for the assessment: Lineouts Passing precision Shooting precision	24 athletes, adolescents between 16 and 18 years old (15 men and 9 women).	Evaluating two 100-day interventions with 2-hour PE sessions on eye-foot coordination. PE sessions only PE sessions + mixed exercise sessions (analytical and global) with eye-foot coordination exercises (passes and shots). 100-day intervention. Two-hour PE sessions	The results show improvements in both intervention groups, but the improvements were greater in the group with extra football drills sessions.

Tsimaras et al., 2014 *Journal of Physical Education and Sport* (Q3) English	Special education schools	Quantitative: Experimental They analysed the effects on distractibility, hyperactivity, and impulsiveness. Instrument: Diagnose der Adulten ADHS (IDAA) and Adult ADHD Self-Report Scale (ASRS).	24 adults aged approximately 20–25 (10 women and 10 men) with ADHD or ID.	Analysing the effects of interactive digital motor games (exergames) on people with ADHD and ID. 36 sessions of 20 minutes with digital interactive tennis games (delivered over 12 weeks). The control group did 2 sessions of PE.	The intervention significantly reduced distractibility, hyperactivity and impulsivity, compared to the control group.

Discussion

The results allow us to analyse the identification, methodological and content variables.

Firstly, with regard to the identification variables, we record the date, journal and language of publication, as well as the authorship of the works analysed.

In terms of the number of papers published on the subject, the field has clearly grown in recent years. It has become an emerging topic in our current society, which promotes inclusive policies. The year with the highest number of identified documents is 2020, with 29.2% of the total (Cañadas & Calle-Molina, 2020; Carvalho et al., 2020; Furrer et al., 2020; Jang, 2020; Krutsevich et al., 2020; Muñoz et al., 2020; Xu et al., 2020). This may be due to the impact of the Covid-19 health crisis, which led to lockdowns and school closures. The exceptional nature of the situation has attracted considerable interest from researchers.

In terms of authorship, a total of 76 authors were involved in the 24 papers analysed. As in previous studies (Marín & Ramón-Llin, 2021), it is noteworthy that all the authors are minor producers, since all of them have only one paper on the subject of Physical Education for students with intellectual disabilities. In terms of co-authorship, most of the documents were written by several authors, so the degree of collaboration is high. Papers written by a single author are a minority, representing only 12.5% of the sample (Hsu, 2016; Jang, 2020; Montesano, 2014). This is in contrast to what happens, for example, in the field of music education (Marín et al., 2022). From a gender point of view, it should be noted that there are no major differences in the number of men and women studying this subject. In both cases, the percentage is close to 50%.

In terms of sources, the information available on the SCImago Journal & Country Rank (SJR) portal, which is based on the information contained in the Scopus database, highlights the quality of the journals in which the articles analysed are published, as can be seen from their quartile rankings.

Finally, the language chosen for the dissemination of the results continues to be English (70.8%), despite the fact that the interventions were carried out in countries on different continents with a wide variety of mother tongues.

On the other hand, regarding the methodological variables in the analysis of the context, the weight of this research topic in Europe stands out, especially in Spain, which is the country where the most work has been carried out (Abellán et al., 2018; Cañadas & Calle-Molina, 2020; Moreno et al., 2019; Vílchez et al., 2018). It should also be noted that a significant number of studies in school contexts have been conducted in specific special education centres or units (Fernandes et al., 2022; Ferreira & Munster, 2017; Hansen et al., 2021; Jang, 2020; Priyono et al., 2021; Wu et al., 2021).

Research designs are extremely diverse, including experimental and quasi-experimental work, studies with interventions and/or control groups, and quantitative data collection techniques such as questionnaires, but also qualitative techniques such as interviews.

This diversity is also evident in the characteristics of the samples: in terms of size, some actions were carried out with groups of less than ten participants (Ferreira & Munster, 2017), while others had more than a thousand students (Furrer et al., 2020); in terms of age or educational level of the participants, there were no studies with pre-school students, and secondary school students (Abellán et al., 2018) and university students (Muñoz et al., 2020) predominated.

The final dimension analysed is content, looking at research objectives, content, and findings. In terms of objectives, the approaches demonstrate the potential of Physical Education. In addition to the development of physical skills (Fernandes et al., 2022; Hansen et al., 2021; Priyono et al., 2021; Wu et al., 2021; Xu et al., 2020), there are studies that focus on social (Cañadas & Calle-Molina, 2020; Carvalho et al., 2020; Ferreira & Munster, 2017), moral (Vilchez et al., 2018), emotional and cognitive (Krutsevich et al., 2020), and vital issues such as inclusion (Furrer et al., 2020; Muñoz et al., 2020), attitudes towards diversity (Abellán et al., 2018), and quality of life (Agarwal et al., 2021).

In terms of content, 38% of the studies include specific activities related to gamification and sports, such as hockey and gymnastics (Cañadas & Calle-Molina, 2020,) badminton (Erofevaa et al., 2019, Vilchez et al., 2018), frisbee (Kao & Wang, 2018), volleyball, handball, acrobatic gymnastics (Vilchet et al., 2018). Of the studies in the sample, 14% used body expression activities, where the use of different types of dance was predominant (Carvalho et al., 2020; Jang, 2020; Muñoz et al., 2020), while 16% of interventions focused on motor skills (Fernandes et al., 2022; Xu et al., 2020; Montesano, 2014) and 16% on balance (Hsu, 2016) and tennis (Tsimaras et al., 2014) exergames. Wu et al. (2021) used activities such as aerobic step, while Krutsevich et al. (2020) chose activities in the natural environment. Finally, 16% of the studies used other types of activities such as peer tutoring (Gobbi et al., 2018), cooperative skills (Furrer et al., 2020) or dance mixed with games and sports (Ferreira & Munster, 2017).

In terms of findings, all interventions showed positive results. Up to 43% of the studies showed physical improvements, both in health aspects (Priyono et al., 2021) and in conditional physical abilities such as strength and/or flexibility (Xu et al., 2020; Erofeeva et al., 2019), as well as in coordinative abilities such as balance (Wu et al., 2021; Hsu, 2016) and coordination (Montesano, 2014).

In addition, 38% of the interventions resulted in emotional benefits, such as improved motivation for motor activities (Fernandes et al., 2022), improved effort (Gobbi et al., 2018), improved psychoemotional state (Krutsevich et al., 2020), and improved perceived self-efficacy (Jang, 2020). Also, 38% of the interventions improved participants' social skills (Priyono et al., 2021; Ferreira & Munster, 2017), promoted interpersonal relationships (Wu et al., 2021), civic behaviour and teamwork (Cañadas & Calle-Molina, 2020), inclusion, recognition and social participation (Carvalho et al., 2020), and attitudes towards student inclusion (Abellán et al., 2018). On the other hand, 24% of the interventions had an effect on cognitive aspects (Priyono et al., 2021), improved reasoning skills (Vilchez et al., 2018) or reduced student distractions (Tsimaras et al., 2014). Finally, other interventions reported improvements in students' values, increasing commitment, honesty and respect (Vilchez et al., 2018) or responsibility and self-control (Ferreira & Munster, 2017).

Conclusions

In a fair, equitable and inclusive society such as the one we aspire to, it is essential that we base our actions on scientific evidence to draw conclusions about what measures can ensure inclusion in the different learning situations in the classroom. We must design our programmes so that people with ID can achieve not only basic curricular knowledge, but also greater independence, greater participation in all contexts and, in short, a better quality of life.

The implementation of intervention programmes specifically designed for students with ID allows for significant improvements in the motor development of the participants, as observed in the work of Fernandes et al. (2022), as well as in other cognitive abilities such as memory or attention (Vega & González, 2022). However, it would be advisable for these interventions to be carried out in the first years of schooling in order to improve different motor aspects, such as hypotonia, which is characteristic of some syndromes.

It is necessary to go further, with the implementation of UDL, which makes it possible to respond to all students and achieve benefits for each one of them. For this, teacher training is essential, which is the basis of teachers' self-efficacy to make inclusion possible (Grassi-Roig et al., 2022).

Regarding the limitations of this work, the choice of a single database and the lack of introduction of altmetrics in the analysis stand out. These issues are considered as prospective and future lines of research, to which we must add the analysis of the impact of PE on students with functional diversity, beyond intellectual diversity.

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