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Visual Impairments and Factors Affecting Participation in Motor and Sports Activities: A Systematic Review
Compromissioni visive e fattori che incidono sulla partecipazione alle attività motorie e sportive. Una revisione sistematica

Fuori Call

Physical activity practiced in childhood and adolescence not only develops young people's physical capabilities but also supports their cognitive and psychological development. However, children and young people with visual impairments often encounter barriers to participation. This contribution documents a systematic literature review on the topic, carried out using a structured investigation framework and in accordance with recognized guidelines. In the first phase of the study, 45,156 articles published over the past ten years were identified from databases relevant to the field under investigation (EBSCO, ERIC, Scopus, Web of Science). Subsequent steps progressively led to the selection of the most relevant articles upon which the research can hinge (n=31). The categorization highlighted how children and adolescents with visual impairments perceive the benefits they can gain from physical and sports activities, but that their experiences are often limited due to conditioning resulting from contextual barriers of an environmental, social, and, albeit to a lesser extent, personal nature. The study strongly underlines the crucial role of teachers and instructors, and their responsibility on the one hand in formulating structurally appropriate proposals while taking into account the specific needs of the participants and, on the other hand, in adopting and promoting inclusive attitudes.

Keywords: blindness, physical education, inclusion, school, teacher education.

L'attività fisica praticata nell'infanzia e nell'adolescenza, oltre a far sviluppare le capacità fisiche dei giovani, ne supporta lo sviluppo cognitivo e psicologico; i bambini e i ragazzi con compromissioni visive, però, incontrano spesso delle barriere alla partecipazione. Il presente contributo documenta una revisione sistematica della letteratura sull'argomento, svolta utilizzando un framework di indagine strutturato e rispettando linee guida accreditate. La prima fase dello studio ha portato all'estrazione di 45156 articoli, pubblicati nel corso degli ultimi dieci anni, tratti da database rilevanti per il settore indagato (EBSCO, ERIC, Scopus, Web of Science); i successivi passi hanno condotto progressivamente alla selezione degli articoli più rilevanti su cui la ricerca può fare perno (n=31). La categorizzazione ha messo in luce come i bambini e i ragazzi con compromissioni visive percepiscano i benefici che possono trarre dall'attività motoria e sportiva, ma vivano frequentemente esperienze limitate per effetto di condizionamenti derivanti da barriere contestuali di tipo ambientale, sociale e, anche se in misura minore, di tipo personale. Dallo studio emerge con forza l'importanza del ruolo dei docenti e degli istruttori, e la loro responsabilità da un lato nel formulare proposte strutturalmente adeguate tenendo conto dei bisogni specifici dei partecipanti e, dall'altro, nell'assumere e promuovere atteggiamenti inclusivi.

Parole chiave: cecità, educazione fisica, inclusione, scuola, formazione dei docenti.

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1. Introduction

The World Health Organization (WHO) defines *physical activity* as "any bodily movement produced by skeletal muscles that requires energy expenditure" (WHO, 2020, p. vii). It can be performed through play, work, sport, therapeutic activities, active transport, household chores, recreational activities, or in other forms. Regular physical activity represents one of the determining factors for public health: it is a protective factor for the prevention of Non-Communicable Diseases (NCDs) and for the reduction of mortality following cardiovascular diseases or diabetes, as well as a mean to counteract certain types of cancer and mental disorders. Beyond the physical benefits, scientific evidence also shows the positive contribution that physical activity offers to psychological well-being and quality of life, strengthening people's cognitive and relational capacities and counteracting isolation and a sedentary lifestyle, which today represent the most relevant challenges. Following this, the costs that can derive to society from necessary personal assistance and the loss of productivity resulting from a sedentary lifestyle also lead to the search for coordinated intersectoral policies, which must involve health, sport, urban planning, transport, and certainly the education sector, to promote daily physical activity (WHO, 2018; 2020; 2024). Finally, physical activity, and sport in particular, constitute enabling factors for sustainable development, as universal rights and components of individual and collective well-being, precursors that lead to respect and peace among individuals and among peoples (UN, 2015). Multiple studies provide guidance on the activity that young people should engage in starting from preschool age (Grady et al., 2025; Lum et al., 2022; WHO, 2021a), and international organizations are increasingly promoting physical activity within structured frameworks that encompass differentiated areas (e.g., contrast to addictions, regulatory action for health protection, fiscal measures supporting social interventions, etc.), following a holistic approach to well-being (Unesco, 2015; WHO, 2023).

Physical Education is the subject which, in the formal school setting, promotes *physical activity* for young people; however, the two expressions refer to distinct, albeit interrelated, constructs, involving different learning pathways, as well as complementary times and contexts: for example, in the same years young people engage in physical activity at school or outside of school, as well as on their way to school, and also at school during break time, and so on. At the same time, the school subject is not limited to the performance of movement activities. It also encompasses understanding one's own body and motor patterns in relation to different contexts, acquiring a healthy lifestyle and focusing on prevention, developing skills that enable interaction with others by practicing the values of fair play, the connection between different languages such as movement for storytelling, the use of the body in relation to music, etc.

We refer more specifically to the intersection between the two areas when speaking of *motor and sports activities in school* (MIUR, 2012).

Many documents take for granted that the development of the relevant competences, both in and outside school, will take place in an equitable and inclusive manner, accessible to all. To give just a few examples, in Italy this is established by the Constitution and the Guidelines for basic sports activity and motor activity in general (Presidenza del Consiglio dei Ministri, 2022), while at international level it is recalled by the Unesco Charter (2015) and the 2030 Agenda (UN, 2015). In practice, however, barriers faced by people with impairments are often and to a large extent disabling. People with visual impairments (VI) encounter both quantitative and qualitative limitations when engaging in motor and sports activities inside and outside school. This can lead to detrimental effects on physical health, as well as on psychological, cognitive, and emotional development. It also contributes to an increased sense of perceived social exclusion, and undermines self-esteem and the personal self-efficacy.

The Global status report on physical activity (WHO, 2022), which presents a synthesis of global progress of the Global Action Plan on Physical Activity 2018–2030 (WHO, 2018), a key strategic document guiding national policies, does not even provide sufficient statistics to assess the promotion of physical activity for people living with disability. In light of this, the authors of this contribution intended to identify the state of the art in the scientific literature concerning two research questions:

– What facilitators and/or effective strategies make motor/sports activity practicable/accessible for children/young people with visual impairments?
– What competencies must teachers and/or instructors possess to make motor/sports activity inclusive?

2. Methods

The research design used to address the research questions followed a protocol structured according to the following steps (Chaimani et al., 2024):

– Frame the question through a structured query, based on a recognized framework;
– Define eligibility criteria for including or excluding studies;
– Identify and search multiple databases relevant to the field of investigation;
– Screen titles and abstracts, then review the full text against the eligibility criteria to create a final list of included studies;
– Summarize data according to categories and systematically collect relevant data from each included study;
– Analyse and present the results;
– Discuss and report findings.

Query and inclusion and exclusion criteria (steps 1 and 2)

The search query has been converted into a search string according to the PICO framework (Table 1). The categories that guided the identification of the keywords were (i) people with visual impairments, (ii) physical education /motor /sports, (iii) strategies/facilitators, (iv) inclusion /participation /effectiveness.

Within each PICO element, the Boolean operators AND and OR are used; the elements are combined with one another using AND.

P	Population	((blind OR blindness OR ipovision OR sightless OR "no vision" OR "low vision") OR ((vision OR visual OR visually OR sensory OR sight OR eyesight) AND (loss OR impairment OR impairments OR impaired OR defect OR defects OR disorder OR disorders OR disability OR disabilities OR disease OR diseases OR problem OR problems)))
I	**Intervention**	(((physical OR phys OR recreation OR motor OR mobility OR psychomotor OR PE OR ed OR coaching OR tutoring) AND (education OR activity OR activities OR exercise OR exercises OR adapted OR skill OR skills)) OR sport OR sports)
C	**Comparison**	(strategy OR strategies OR method OR methods OR methodology OR methodologies OR competence OR competences OR competencies OR activity OR activities OR teach OR teaching OR educational OR education OR facilitator OR facilitators OR facility OR "school-based intervention" OR "school-based interventions")
O	**Outcomes**	((inclusive OR inclusion OR integration OR usability OR accessibility OR accessible OR participate OR participating OR participation) OR (effective OR efficacy OR effectiveness OR effect OR evidence OR success OR successful OR successfully))

Table 1. Query structure according to the PICO framework[1]

1 After several tests, it was decided to spell out the key terms in both singular and plural forms, avoiding the use of the asterisk, which should have captured both forms but yielded only partial results.

The following inclusion criteria were established:

- articles published in peer-reviewed journals;
- written in English, Italian, French;
- published between 2014 and 2024 (even if referring to earlier studies);
- open access or accessible through the library system of the Università degli Studi di Firenze (University of Florence);
- referring to first or second level studies (e.g. systematic reviews and meta-analyses), theoretical or empirical, conducted with quantitative, qualitative or mixed methods;
- referring to school-aged children/young people (5-19 years) participating in groups that include people with visual impairments and without comorbidities;
- referring to research carried out in the context of motor and/or sports activities in school or non-school settings;
- no exclusions based on gender, ethnicity, socioeconomic status, geographic area, or sample size.

The exclusion criteria were as follows:

- editorials, books, book chapters, proceedings, undergraduate or doctoral theses were not included;
- studies related to the elite athlete were not included.

Study selection and data extraction (steps 3 and 4)

The search was conducted online, using subject-specific databases in the humanities, social sciences, and multidisciplinary fields, accessible via the University of Florence Library System (SBA) through the Onesearch interface. The databases consulted were EBSCO (Education Source Ultimate, integrating APA PsycInfo and Child Development & Adolescent Studies), ERIC, Scopus, Web Of Science. The database searches took place on a single day, October 21, 2024. The articles were exported from the databases to Zotero in RIS format, then converted to CSV format and imported into a Microsoft Excel spreadsheet. Duplicate records were removed automatically using the unique code DOI (Document Object Identifier), and subsequently through Excel's functions, with manual checking based on title, author, and bibliographic references.

Data analysis (steps 5 and 6)

The extracted articles were subsequently analysed at various levels.

In a first phase, referred to as Screening 1, the relevance of the articles was assessed by reading the title and abstract. The articles deemed eligible were subjected to a second screening phase, referred to as Screening 2, in which relevance was assessed through the full-text reading by two independent reviewers.

The resulting articles that passed this second phase were then analysed using an ex-post categorization, in order to extract the key information in a structured form.

Discussion and reporting of final findings (step 7)

The final phase fulfilled a dual purpose: on the one hand, it critically assessed the quality of the evidence presented in support of the reported findings, and on the other hand, it systematically related the findings traced in the articles to the research questions. The implications will in fact provide the operational translation of the results, connecting the scientific evidence obtained to recommendations for practice and for future research.

3. Results

The study selection process is presented using the PRISMA guidelines (Page et al., 2021), as shown in Fig. 1.

The query applied to the databases identified a total of 45,156 articles. After removal of duplicates (n=12,676), 32,480 articles remained.

After the Screening 1 phase, 97 articles were deemed relevant based on their title and abstract. 28 of these were neither in open access nor available through the library system of the University of Florence.

The Screening 2 phase was applied to the remaining 69 articles. After full-text reading, 31 articles were found to be relevant (28 primary studies and 3 systematic reviews). 38 articles were excluded at this stage because they were not relevant to the research questions or did not meet the inclusion and exclusion criteria.

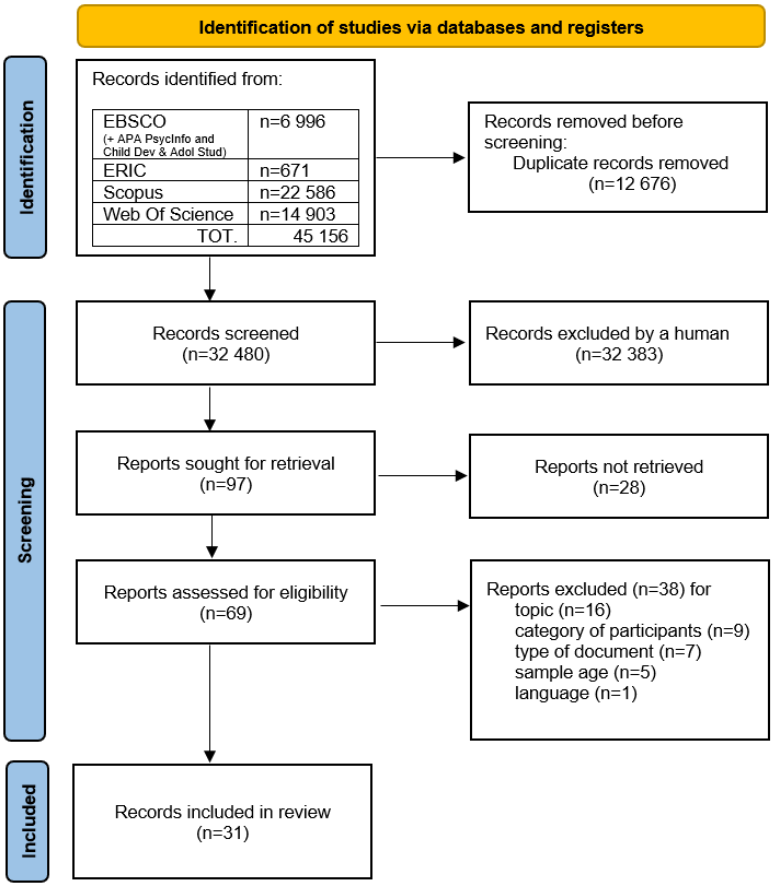

Fig. 1. Article selection process according to PRISMA guidelines (Page et al., 2021)

4. Analysis of results

Among the 31 articles included in the research, 11 (accounting for 32%) concern the United States, 4 Australia, 2 (each) Brazil, Austria, Turkey, and Nigeria, 1 (each) Puerto Rico, Slovakia, the Czech Republic, Switzerland, and Germany. In 6 cases (accounting for 17%), it was not possible to retrieve information relating to the geographical context (Fig. 2)[2].

2 The total number of publications categorized by geographical area is higher than the 31 articles included because, in two cases, the research involved multiple countries.

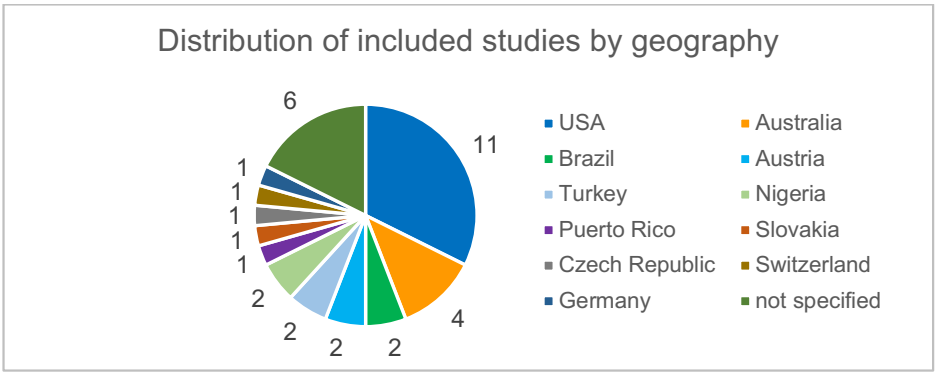

Fig. 2. Distribution of studies by geographical area

An analysis of the distribution of the selected publications over time shows that the overall number of research and studies on the topic has increasing over the last decade. Although the trend is not consistently upward, there is a clear and sustained interest in the subject, with at least one publication per year (Fig. 3).

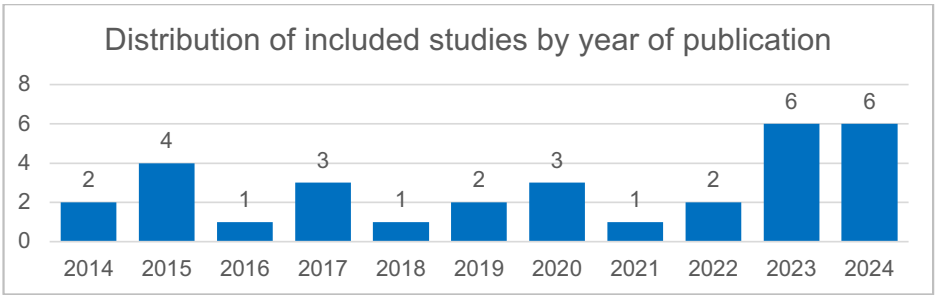

Fig. 3. Distribution of studies by year of publication

The 31 extracted articles were published across 17 scientific journals, spanning several fields of study, ranging from medical-health and sports, from education and schooling to the humanities. This distribution highlights the breadth of the research and its interdisciplinary nature (Table 2).

Journal	Number of articles
Acta Gymnica	1
Arts & Health: An International Journal for Research, Policy and Practice	1
British Journal of Visual Impairment	5
Education Sciences	1
European Physical Education Review	1
Frontiers in Sports and Active Living	1
International Journal of Disability, Development and Education	1
International Journal of Environmental Research and Public Health	2
International Journal of Kinesiology and Sports Science	1
International Journal of Whole Schooling	1
Journal of Physical Education, Recreation and Dance	1
Journal of Visual Impairment & Blindness	3

Medical Science Monitor	1
Palaestra	8
Physical Educator-US	1
Sport, Education and Society	1
Support for Learning	1
TOTAL	**31**

Table 2. Number of publications per scientific journal

In the 31 selected studies, the scholars Justin A. Haegele[3] and Lauren J. Lieberman[4] frequently appear as authors or co-authors, with 11 and 9 contributions respectively (Table 3).

Author(s)	Journal	Publications	Year of publication
Haegele, Lieberman, Columna & Runyan	*Palaestra*	1	2014
Lieberman, Haegele & Lepore	*Palaestra*	1	2014
Haegele	*Journal of Visual Impairment & Blindness*	1	2015
Haegele, Yessick & Kirk	*British Journal of Visual Impairment*	1	2017
Lieberman & Linsenbigler	*Palaestra*	1	2017
Tanure Alves, Haegele & Duarte	*British Journal of Visual Impairment*	1	2018
Haegele & Buckley	*Journal of Visual Impairment & Blindness*	1	2019
Lieberman, Lepore, Lepore-Stevens & Ball	*Journal of Physical Education, Recreation and Dance*	1	2019
Lieberman & Childs	*Journal of Visual Impairment & Blindness*	1	2020
Armstrong, Lieberman, Martin, Moore, Snapp & Mannella	*Palaestra*	1	2022
Cain, Fanshawe, Armstrong & Lieberman	*International Journal of Disability, Development and Education*	1	2023
Haegele, Salerno, Nowland, Zhu, Keene & Ball	*European Physical Education Review*	1	2023
Erbes Ranzan, dos Santos Alves, Wasem Walter, De Abreu Van Munster, De Souza, Lieberman & Tanure Alves	*Palaestra*	1	2023
Ruin, Haegele, Giese & Baumgärtner	*International Journal of Environmental Research and Public Health*	1	2023
Esatbeyoglu, Kirk & Haegele	*British Journal of Visual Impairment*	1	2023
Haegele, Ball, Nowland, Keene & Zhu	*Sport, Education and Society*	1	2024
Caron, Allegranza, Lieberman & Haibach-Beach	*British Journal of Visual Impairment*	1	2024
Holland, Haegele, Zhu & Bobzien	*Physical Educator-US*	1	2024
	Total	**18**	

Table 3. Publications of the most frequent authors (in bold)

3 Professor at the Department of Human Movement Studies and Special Education at Old Dominion University (Norfolk, VA, USA).

4 Professor at the Department of Kinesiology, Sport Studies and Physical Education at State University of New York (New York, NY, USA).

The studies conducted are mostly qualitative (45%). Through interviews, focus groups, diaries, or narrative accounts, but also surveys or questionnaires, they explore the experience – in terms of perceptions and emotions – of people with visual impairments regarding various types of motor and sports activities. In all but one of these studies, the sample consisted of people with visual impairments, who were directly involved in interviews or focus groups or as recipients of questionnaires[5]. One study stands out as an exception (Clements et al., 2024). It proposed a survey to the family members of people with visual impairments, with the aim of assessing the motor and sports activities practiced by people with visual impairments and understanding the motivations behind their choices.

Another large proportion of the publications included in this systematic review (35%) consists of theoretical studies on the topic. This category includes articles that discuss methods for adapting motor and sports activities to the specific needs of people with visual impairments, as well as strategies to favour the transfer of techniques learned in motor activities practiced at school toward independent practices outside school. There are also articles that provide practical guidelines for physical education teachers or sports instructors working with people with visual impairments, which present questionnaires for identifying barriers to participation in these activities, or that explain the structures of initiatives such as Camp Abilities. A further ten percent (10%) of the publications are mixed-method studies, and another 10% consist of systematic reviews on the topic (Fig. 4).

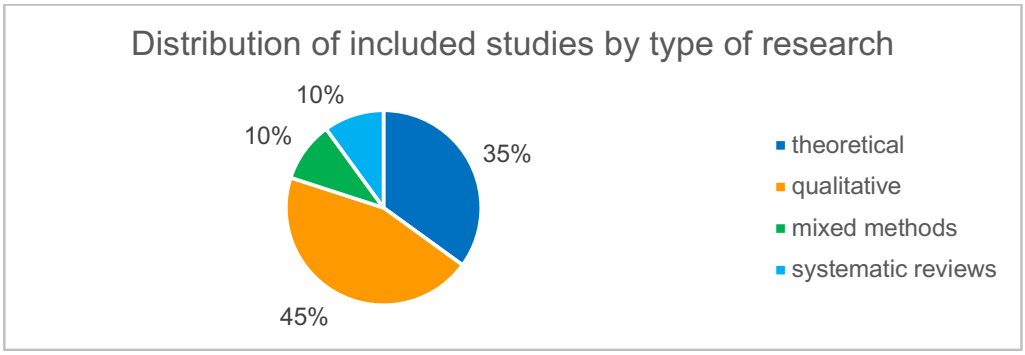

Fig. 4. Distribution of studies by type of research

The studies included in the present contribution are fairly evenly distributed between school and extracurricular settings: 45% is focused on physical education within school contexts, 42% on motor and sports activities practiced outside of school, 10% cover both, and 3% does not specify the context of application in detail, suggesting that this information is not considered decisive (Fig. 5).

5 Among the questionnaires used are the International Physical Activity Questionnaire short form (IPAQ-SF), which measures the level of physical activity practiced by people with visual impairments, and the Physical Activity Barriers Questionnaire for Youth with Visual Impairments (PABQ-VI), which records the barriers perceived by people with visual impairments when participating in physical activities.

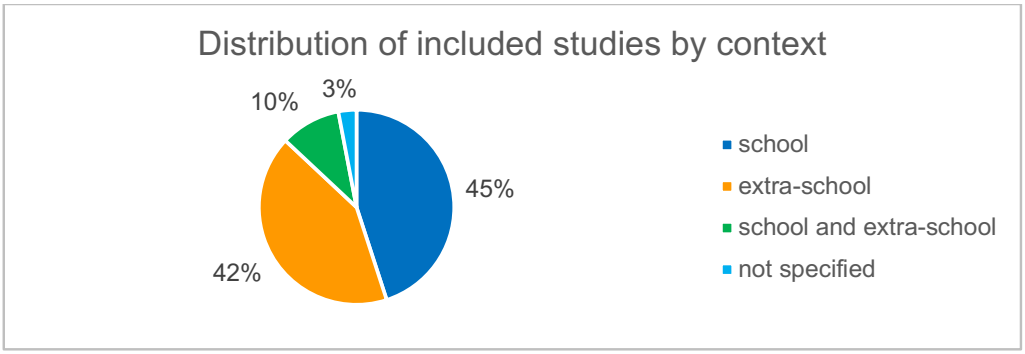

Fig. 5. Distribution of studies by context

It was not always possible to extrapolate additional information from the articles regarding the motor or sports activities proposed, for example, whether they were practiced indoors or outdoors, in groups or individually, frequently or occasionally, or whether they involved only body movement or also the use of equipment. Sometimes, some information was also missing regarding the degree of adaptation in relation to spaces, equipment, and rules. However, the types of sports, activities, and motor games mentioned were recorded and presented in Table 4, categorized in alphabetical order, together with references to the research articles.

Type of activity	N. of citations	Reference paper
Adventure sport (climbing, rock climbing)	2	Lieberman & Linsenbigler (2017); Erbes Ranzan, dos Santos Alves, Wasem Walter, De Abreu Van Munster, De Souza, Lieberman & Tanure Alves (2023)
Archery	1	Lieberman & Linsenbigler (2017)
Athletics (long jump, running, throwing/discus/shot put, track and field)	4	Lieberman & Childs (2020); Erbes Ranzan, dos Santos Alves, Wasem Walter, De Abreu Van Munster, De Souza, Lieberman & Tanure Alves (2023); Caron, Allegranza, Lieberman & Haibach-Beach (2024); Clements, Crochrane & Richmond (2024)
Basketball	1	Clements, Crochrane & Richmond (2024)
Beep baseball	3	Charles (2020); Lieberman & Childs (2020); Caron, Allegranza, Lieberman & Haibach-Beach (2024)
Biking (cycling, tandem biking)	3	Lieberman & Linsenbigler (2017); Caron, Allegranza, Lieberman & Haibach-Beach (2024); Clements, Crochrane & Richmond (2024)
Bowling	1	Erbes Ranzan, dos Santos Alves, Wasem Walter, De Abreu Van Munster, De Souza, Lieberman & Tanure Alves (2023)
Combat sport (capoeira, judo, martial arts, tai-chi-chuan)	4	Erbes Ranzan, dos Santos Alves, Wasem Walter, De Abreu Van Munster, De Souza, Lieberman & Tanure Alves (2023); Esatbeyoglu, Kirk & Haegele (2023); Caron, Allegranza, Lieberman & Haibach-Beach (2024); Clements, Crochrane & Richmond (2024)
Cricket	1	Clements, Crochrane & Richmond (2024)
Cross-country skiing	1	Erbes Ranzan, dos Santos Alves, Wasem Walter, De Abreu Van Munster, De Souza, Lieberman & Tanure Alves (2023)
Dancing	2	Bruyneel & Nightingale (2024); Clements, Crochrane & Richmond (2024)
Fishing	1	Lieberman & Linsenbigler (2017)
Floormatics	1	Atare, Abdullah, Olarinoye & Ibraheem (2024)
Football	1	Clements, Crochrane & Richmond (2024)

Goalball	4	Charles (2020); Erbes Ranzan, dos Santos Alves, Wasem Walter, De Abreu Van Munster, De Souza, Lieberman & Tanure Alves (2023); Caron, Allegranza, Lieberman & Haibach-Beach (2024); Clements, Crochrane & Richmond (2024)
Gymnastics	3	Erbes Ranzan, dos Santos Alves, Wasem Walter, De Abreu Van Munster, De Souza, Lieberman & Tanure Alves (2023); Caron, Allegranza, Lieberman & Haibach-Beach (2024); Clements, Crochrane & Richmond (2024)
Horseback riding	2	Lieberman & Linsenbigler (2017); Clements, Crochrane & Richmond (2024)
Kayaking/canoeing	1	Lieberman & Linsenbigler (2017)
Netball	1	Clements, Crochrane & Richmond (2024)
Rollerblading	1	Lieberman & Linsenbigler (2017)
Rugby	1	Clements, Crochrane & Richmond (2024)
Soccer	3	Erbes Ranzan, dos Santos Alves, Wasem Walter, De Abreu Van Munster, De Souza, Lieberman & Tanure Alves (2023); Caron, Allegranza, Lieberman & Haibach-Beach (2024); Clements, Crochrane & Richmond (2024)
Stand up paddle	3	Fernández-Vivó & Cordero-Morales (2015); Lieberman & Linsenbigler (2017); Caron, Allegranza, Lieberman & Haibach-Beach (2024)
Surfing	1	Clements, Crochrane & Richmond (2024)
Swimming	4	Miyauchi (2020); Erbes Ranzan, dos Santos Alves, Wasem Walter, De Abreu Van Munster, De Souza, Lieberman & Tanure Alves (2023); Caron, Allegranza, Lieberman & Haibach-Beach (2024); Clements, Crochrane & Richmond (2024)
Takkyu volley	1	Erbes Ranzan, dos Santos Alves, Wasem Walter, De Abreu Van Munster, De Souza, Lieberman & Tanure Alves (2023)

Table 4. List of motor or sports activities discussed in the included articles

The categorization allowed for a more in-depth and structured analysis of the contents of the 31 selected articles. It was conducted in several phases and was the result of a thorough discussion among the authors of the present contribution. In a first phase, the three researchers jointly developed a classification hypothesis based on already known literature, the theoretical framework, and an initial reading of the articles. In the second phase, they separately tested the classification on an agreed-upon set of five articles and, after comparing the results, proceeded to a better specification of the criteria. In the third phase, two of the three researchers (M. B. and S. M.) independently completed the categorization procedure. Finally, the three researchers compared their work and resolved the cases where their attributions that did not perfectly coincide. The most significant data extracted from the articles are reported in Table 5.

	Paper (authors and year)	Country	Type of research	Data sample N.	Age	VI	Context and type of activity	Focus and findings
1	Haegele, Lieberman, Columna & Runyan (2014)	USA	theoretical	n.a.[6]	n.a.	n.a.	PE in schools	*Focus*: discuss ways of integrating 9 components of the Expanded Core Curriculum (ECC) into the practice of PE
2	Lieberman, Haegele & Lepore (2014)	USA	theoretical	n.a.	n.a.	n.a.	Sports in extra-school time (e.g. Camp Abilities)	*Focus*: present Camp Abilities structure and activities
3	Haegele (2015)	USA	theoretical	n.a.	n.a.	n.a.	Sports in extra-school time	*Focus*: discuss ways of fostering the generalization of learning and techniques achieved in motor activities practiced in school to the free time practices
4	Demirturk & Kaya (2015)	Turkey	qualitative	22	6-16	mix[7]	PE in schools	*Focus*: perceptions of students with VI on PE activities in school and comparison with sighted peers (on difficulties experienced and levels of physical activity) *Findings*: Physical activity levels of VI students and sighted peers were similar ($p>0.05$). Totally blind students had lower IPAQ scores than low vision students ($p<0.05$), and girls were less active physically than boys ($p<0.05$). Students with VI reported 2 major limitations: fear of injury (although there was a low accident rate) and a desire to expand the motor activities they practiced (other than goalball and torball)
5	Kurková, Nemček & Labudová (2015)	Slovakia and Czech Republic	qualitative	33	n.s.	mix	PE in schools	*Focus*: perceptions of students with sensory disabilities (VI and D/HH[8]) on PE activities in school *Findings*: great interest and strong feelings shown by students with VI (compared to D/HH peers) toward PE even though little practice was recorded (few exercises and physical problems). Preference for individual activities (e.g. swimming, athletics, gymnastics) to avoid contact with others and reduce the fear of injury
6	Fernández-Vivó & Cordero-Morales (2015)	Puerto Rico	theoretical	n.a.	n.a.	n.a.	Sports in extra-school time (stand up paddle)	*Focus*: present adaptations and modifications of stand up paddle practice for youngsters with VI
7	Southcott & Opie (2016)	Australia	qualitative	1	n.s.[9]	n.s.	PE in schools	*Focus*: perceptions of a senior student with VI on school experiences *Findings*: sense of exclusion from PE (and Science) classes in particular, general acceptance of alternatives often proposed in order to avoid difficult situations (confusion, overcrowding, difficulty of movement and fear of injury)
8	Haegele, Yessick & Kirk (2017)	USA	qualitative	4	12-18	mix	Sports in extra-school time	*Focus*: perceptions of youngsters with VI living in Alaska on physical activities *Findings*: preference for unstructured physical activities compared to sports and structured activities (hypothetically because of poor resources and facilities of the specific context), and support from family members in sports practice (although not always detected)
9	Opie, Deppeler & Southcott (2017)	Australia	qualitative	7	17-19	mix	PE in schools	*Focus*: efficacy of the support provided to students with VI in PE activities *Findings*: support was mostly seen as inadequate and inconsistent linked to a lack of teacher training (particularly on adaptations that allow students with VI to access the curriculum), teaching activities and lesson pacing that did not encourage active participation and compounded by overprotective and discouraging attitudes due to a strong concern for student safety

10	Lieberman & Linsenbigler (2017)	n.s.	theoretical	n.a.	n.a.	n.a.	Sports in extra-school time (e.g. kayaking/canoeing, rock climbing, SUP, archery, fishing, rollerblading, biking, horseback riding)	*Focus*: provide operational instructions to physical activities and sports teachers for youngsters with VI
11	Tanure Alves, Haegele & Duarte (2018)	Brazil	qualitative	8	13-18	n.s.	PE in schools	*Focus*: perception of students with VI on PE experience *Findings*: general feeling of exclusion from PE classes by their peers (even though these were often seen as opportunities for social interaction) and by teachers, who did not recognize PE classes as a suitable place for them
12	Haegele & Buckley (2019)	USA	qualitative	4	11-16	B2-B3-B4	PE in schools	*Focus*: PE experiences of students with VI living in Alaska *Findings*: in some cases participation was made possible thanks to the provision of adaptations, in other separate activities were planned. Often the interaction between peers did not give the desired effects, but confirmed social isolation
13	Lieberman, Lepore, Lepore-Stevens & Ball (2019)	n.s.	theoretical	n.a.	n.a.	n.a.	PE in schools and sports in extra-school time	*Focus*: provide terminology, strategies and operating methods, adaptations and modifications to sports instructions for youngsters with VI
14	Lieberman & Childs (2020)	USA	theoretical	n.a.	n.a.	n.a.	Sports in extra-school time (e.g. beep baseball, track and field, running, long jump, throwing/discus/shot put)	*Focus*: present a self-determination development program in which to identify the specific needs of the person with VI to understand what adjustments to make to allow maximum possible participation
15	Charles (2020)	Nigeria	theoretical	n.a.	n.a.	n.a.	Sports in extra-school time (e.g. beep baseball, goalball)	*Focus*: discussion on the importance of sports and physical activity for the development of social skills in young people with VI
16	Miyauchi (2020)	n.s.	systematic review	n.s.	n.s.	n.s.	PE in schools	*Focus*: general education teachers' perceptions of inclusive education of students with VI and their difficulties in accessing subjects as Mathematics, Science and PE *Findings*: general education teachers often reported a sense of unpreparedness, especially in teaching PE (and Science), despite an inclusive approach to education, due to a lack of effective pedagogical strategies and external specialist support
17	Bach (2021)	n.s.	theoretical	n.a.	n.a.	n.a.	Sports in extra-school time (e.g. swimming)	*Focus*: present adaptation and modification for water sports for young people with VI
18	Alcaraz-Rodriguez, Medina-Rebollo, Munoz-Llerena & Fernandez-Gavira (2022)	n.s.	systematic review	n.s.	n.s.	n.s	PE in schools and sports in extra-school time	*Focus*: effects on the social participation of people with VI in relation to participation in physical activities *Findings*: participation in physical activities is considered an important opportunity by people with VI for participation and social inclusion, but contexts and people are still not prepared to welcome them (poor preparation in response to specific needs)

6 "n.a." means "not applicable".
7 "mix" includes all recognized categories of visual impairment, namely B1, B2, B3 and B4.
8 "D/HH" means "deaf" or "hard of hearing".
9 "n.s." means "not specified".

19	Armstrong, Liberman, Martin, Moore, Snapp & Mannella	n.s.	theoretical	n.a.	n.a.	n.a.	n.s.	*Focus*: provide a ready-to-use copy of the PABQ-VI, including administration guidelines and instructions for interpreting scores. Also discuss resources and strategies to support the inclusion of youth with VI in Health and Physical Education (HPE) programs and community sports
20	Cain, Fanshawe, Armstrong & Lieberman (2023)	Australia	qualitative	11	8-15	mix	PE in schools	*Focus*: perceptions of barriers to physical activity participation by students with VI *Findings*: general confidence in the possibility of practicing PE even if they are afraid of getting hurt and they feel a lack of support from parents. Females are more exposed to exclusion and bullying. Some episodes of exclusion by PE teachers and barriers in accessing sports available in the area are reported
21	Haegele, Salerno, Nowland, Zhu, Keene & Ball (2023)	USA	qualitative	18	12-15	mix	PE in schools	*Focus*: adaptation and modification in PE for people with VI *Findings*: adaptation (when present and effective) have an ambivalent value: they foster the sense of belonging to the group, allowing the person with VI to participate in activities, but, at the same time, they also emphasize differences
22	Erbes Ranzan, dos Santos Alves, Wasem Walter, De Abreu Van Munster, De Souza, Lieberman & Tanure Alves (2023)	Brazil	theoretical	n.a.	n.a.	n.a.	Sports in extra-school time	*Focus*: Camp Abilities Brazil 2019 structure presentation
23	Ruin, Haegele, Giese, Baumgärtner (2023)	Austria, Germany and USA	qualitative	22	12-21	mix	PE in schools	*Focus*: comparison in the perceptions of barriers and challenges of people with VI in PE between different countries (Austria, Germany and USA) *Findings*: widespread feeling of "inability" in physical and sports practice, linked to the strong presence of ableist ideals of "normality" both in relationships with peers and teachers. Poor understanding and preparation of PE teachers on possible adaptations for people with VI. Adaptations perceived, at the same time, as adequate and functional to participation and as excessive and unnecessary
24	Esatbeyoglu, Kirk & Haegele (2023)	Turkey	qualitative	14	13-18	mix	Sports in extra-school time (e.g. capoeira)	*Focus*: perceptions of people with VI participating in a Capoeira program *Findings*: general feeling of fun and involvement, sense of physical and psychological safety, sense of belonging to the group (even if mainly with the instructor tutor), effective strategies for teaching methods (hand-under-hand, tactile modeling)
25	Meier, Höger & Giese (2023)	Austria	qualitative	19	14-20	mix	PE in schools	*Focus*: perceptions of people with VI on opportunities and barriers in participating in physical activities in special schools *Findings*: participants still perceived room for improvement in the organization of PE activities in special schools, not yet fully able to participate freely, despite the organizational and structural precautions of the spaces and the preparation of teachers, inconsistency of the rules that recall a "normality"
26	Haegele, Ball, Nowland, Keene & Zhu (2024)	USA	qualitative	16	12-15	mix	PE in schools	*Focus*: perceptions of people with VI on motor activities proposed at school through the mediation of a peer tutor *Findings*: Peer tutoring in couples of friends is often experienced as a "natural" event, vice versa, if practiced with distant people, it can generate a sense of inadequacy. People with VI almost always play the role of tutee exclusively and live these occasions with discomfort (being labeled as "incapable" and perceived as an additional burden for the tutor)

27	Caron, Allegranza, Lieberman & Haibach-Beach (2024)	USA	systematic review	1126 ca.	7-18	mix	Sports in extra-school time (e.g. Camp Abilities)	*Focus*: detect the effects of Camp Abilities *Findings*: Camp Abilities are seen as opportunities at different levels: for people with VI to participate in physical activity, for teachers to learn new modalities and adaptations for sport, for researchers to improve the quality of the programs
28	Bruyneel & Nightingale (2024)	Switzerland	mixed	9	8-18	mix	Sports in extra-school time (e.g. dance)	*Focus*: perceptions of participants with VI in the dance course (with sighted peers) and effects on their motor skills *Findings*: benefits on a personal level (stress reduction, joy, self-esteem in interacting with others, motivation for the final performance, etc.) and benefits on a physical level (posture, balance, walking speed, reduction of sedentary lifestyle, etc.) were recorded by all participants
29	Clements, Cochrane & Richmond (2024)	Australia	mixed	35	3-18	mix	PE in schools and sports in extra-school time (e.g. swimming, walking, football, cycling, dancing, basketball, surfing, running, athletics, goalball, martial arts, soccer, horse riding, gymnastics, netball, rugby, cricket)	*Focus*: identify the physical activities in which children with VI are engaged and understand how they have chosen them *Findings*: initial participation in physical activities was influenced primarily by parents, child choices, child skills and other external factors (such as receiving advertising or specific information)
30	Atare, Abdullah, Olarinoye & Ibraheem (2024)	Nigeria	mixed	90	8-28	mix	Sports in extra-school time (e.g. floormatics)	*Focus*: satisfaction with the floormatics game in terms of enjoyment and inclusion *Findings*: 98% of participants were enthusiastic and willing to continue participating [P<.05] and engaged in competition with their peers regardless of their visual status [P<.05]. No significant difference in satisfaction level [P>.05] or involvement in competition [P>.05] was found between sighted and participants with VI
31	Holland, Haegele, Zhu & Bobzien (2024)	USA	qualitative	3	10-17	mix	PE in schools	*Focus*: perceptions of students with VI on experiences of integrated PE *Findings*: general feeling of poor acceptance or appreciation by teachers and peers in integrated PE classes. Participants appreciated the social aspect of PE, but felt that the lack of adaptations, safety measures, and preparation of the teachers hindered their overall sense of inclusion

Table 5. Summary of the main findings concerning the 31 selected articles

5. Discussion

This section critically appraises the methodological rigor of the systematic review and contextualizes the findings in relation to the research questions.

Critical appraisal of systematic review

From a methodological standpoint, several quality elements highlight the rigor of the systematic review, directly linked to the choices made in identifying the studies and to the inclusion and exclusion criteria.

The first factor to consider is related to the selected databases: EBSCO, ERIC, Scopus, and Web of Science. In addition to being highly specific to the field of investigation, these databases also offered a multidisciplinary perspective on the object of study. The bibliographic selection was broad across several

parameters, which ensures the representativeness and generalizability of the results: (i) the review included a wide variety of motor and sports activities and covered both school and extracurricular settings, with the intent of providing a perspective spanning the entire life of the child or young person with VI; (ii) the selection of articles was wide-ranging in terms of geographical areas and years considered, thereby minimizing temporal and geographical bias; (iii) only material from peer-reviewed journals was included, and this ensures that the studies had already undergone evaluation by external experts.

A further factor contributing to the robustness and objectivity of the review lies in the screening and categorization procedure adopted, whose accuracy was carefully documented in compliance with systematic review standards: (i) the three researchers alternated between phases conducted individually and autonomously, which minimised mutual conditioning; (ii) these autonomous phases were followed by structured comparison phases, which were essential both to identify possible improvements and to resolve minor discrepancies that emerged in the conclusions reached.

Conversely, the examined samples are consistently composed of a very limited number of subjects, a common feature in special education research. An exception is represented by the studies on Camp Abilities (Caron, Allegranza, Lieberman & Haibach-Beach, 2024), whose data, although quantitatively larger, are more difficult to generalize due to the context-specific nature. To some extent, the deliberate decision not to impose constraints on the minimum number of subjects was beneficial, since single-case study or research on very small groups is utilized in this field as a research tool to achieve a deep understanding of the problem.

Furthermore, a critical element that hinders the aggregation of results (data synthesis) is the lack, within the studies, of certain more specific contextual information, which would be necessary to better frame the factors that may have intervened and to assess the replicability of the situations.

What facilitators and/or effective strategies make motor/sports activity practicable/accessible for children/young people with visual impairments?

Although motor and sports activities exert a strong interest on young people with visual impairments, the studies analysed in this review indicate the presence of numerous barriers – located on distinct but interconnected levels – that hinder participation and prevent regular practice both inside and outside school (Cain et al., 2023; Caron et al., 2024; Kurková et al., 2015; Holland et al., 2024). The following sections organize the results drawn from the different studies around three thematic areas that reflect the structure of the International Classification of Functioning, Disability and Health (WHO, 2001), one of the key documents for promoting the participation of people with disabilities. These are: (i) environmental contextual factors, (ii) social contextual factors, and (iii) personal contextual factors. This perspective does not explicitly emerge from the individual studies but can be inferred through a reflection that considers the body of findings as a while. In any case, to remain faithful to the selected works and to share the critical processes developed, reference is made, where appropriate, to the individual articles.

Environmental contextual factors

The thematic area of environmental contextual factors includes all issues related to the organization and structure of the context. Young people with visual impairment, when questioned about these issues, frequently reported the scarcity – in both quantity and quality – of motor and sports opportunities in which they could be involved, both in school and extracurricular settings. This scarcity is essentially linked to the lack of dedicated resources and of specific training for the appointed personnel, whether teachers or instructors (Cain et al., 2023; Haegele et al., 2017; Holland et al., 2024; Kurková et al., 2015; Meier et al., 2023; Opie et al., 2017; Ruin et al., 2023).

The factors that facilitate access and participation of people with visual impairments in motor and sports activities are adaptations, meaning all the specific modifications made to the activity precisely in relation to the conditions of the people practicing it. These adaptations may concern a multitude of aspects related to motor or sports practice: from the structure and setup of the space to the arrangement

of materials and the modification of specific equipment, from the rules to the forms of participation (Bach, 2021; Lieberman et al., 2014; Lieberman et al., 2019).

For example, tactile maps of the facility (gym, swimming pool, locker room, etc.) or of the space where the motor activity or sport is performed, as well as tactile pathways created through elements of different texture, are useful adaptations for people with visual impairment because they allow for a greater degree of autonomy of movement and management of their own equipment (Bach, 2021; Fernández-Vivó & Cordero-Morales, 2015). Adaptations made in relation to material and equipment include, for instance, the audible balls used in beep baseball or goalball, but also the placement of sound boxes or other sound transmitters to signal the distance covered from a certain point or to enhance the perception of the water depth in a pool (Bach, 2021).

Adaptations made to rules or forms of participation mainly involve sports such as goalball, football, soccer, floormatics, and other team games, where it is possible, where appropriate, to allow combined participation of blind, visually impaired, and sighted individuals (as in floormatics) (Atare et al., 2024). Among the most effective strategies for teaching physical and sports activities, the analysed articles report tactile modelling techniques, such as hand-over-hand[10], hand-under-hand[11][2], or body touch, along with the use of brightly coloured clothing (for example on the upper and lower limbs) to enable partially sighted participants to see the key movements more clearly (Bach, 2021; Esatbeyoglu et al., 2023; Fernández-Vivó & Cordero-Morales, 2015; Lieberman & Linsenbigler, 2017; Lieberman et al., 2019). In addition, pre-teaching is also mentioned, a strategy that allows the person with visual impairment to benefit in advance – compared to the broader group – from one or more teaching sessions of the motor or sports practice, in order to prepare them for the scenario they will encounter (by exploring the space, equipment, materials, etc.). Another is whole-part-whole instruction, a teaching method that stimulates new acquisitions through the alternation of multiple phases which, starting from the global presentation, move to the particular, namely the explanation of a specific section (a movement or a moment of the game, activity, etc.), before returning to the global level (Lieberman et al., 2019).

These adaptations are considered, in most cases, a necessary condition for expanding the offering of motor and sports proposals for people with visual impairment, because they guarantee access and physical safety and support autonomy (Bach, 2021; Cain et al., 2023; Demiturk & Kaya, 2015; Esatbeyoglu et al., 2023; Fernández-Vivó & Cordero-Morales, 2015; Haegele & Buckley, 2019; Holland et al., 2024; Lieberman et al., 2014; Opie et al., 2017).

Social Contextual Factors

This thematic area encompasses all issues related to social and culturally rooted interactions. Although learners with visual impairment involved in the studies included in this systematic review almost invariably acknowledge the intrinsic value of integrated or mixed physical activities, viewing them as key opportunities to meet, interact, and socialize with sighted peers (Cain et al., 2023; Charles, 2020; Holland et al., 2024; Tanure Alves et al., 2018), they have nonetheless frequently reported a preference for individual physical activities, which are to be executed separately (Alcaraz-Rodriguez et al., 2022; Kurková et al., 2015; Southcoot & Opie, 2016).

There are essentially two underlying reasons. On one hand, the more practical and concrete reason, linked to the organization and structuring of the context, is the fear of encountering situations of intense sound confusion, leading to spatial disorientation[12], which increases the risk of accidents (Cain et al.,

10 In the hand-over-hand modality, the teacher or instructor places their hand over the hand of the person with visual impairment and, in this way, provides guidance and directly models the movement to be performed. It is typically used with beginners, for teaching new movements, in situations where passive direct contact is tolerated.

11 In the hand-under-hand modality, the person with visual impairment places their hand on top of the teacher's or instructor's body to understand how to perform the movement. Compared to the modality hand-over-hand, hand-under-hand allows for a more active role.

12 Many contemporary societies are visuocentric, which can inherently constitute a form of ableism towards people with visual impairment. Hearing, the vicarious sense utilized by individuals with visual impairment to compensate for their visual

2023; Kurková et al., 2015; Southcoot & Opie, 2016). On the other hand – the more social and cultural one – there is the fear that interaction with sighted peers might generate direct or indirect phenomena of isolation and exclusion. Among the direct phenomena, we can cite, for example, episodes of bullying that may affect the movement experiences of girls and young women, who are already often less physically active (Cain et al., 2023; Demiturk & Kaya, 2015; Tanure Alves et al., 2018). Examples of indirect phenomena of isolation and exclusion, conversely, are experiences of integrated or mixed physical activities where inequalities are reproduced, validating the 'disabled' status of young people with visual impairment (Haegele & Buckley, 2019; Holland et al., 2024; Tanure Alves et al., 2018). These perceptions, in fact, seem to be largely shaped by an ideal of 'normality' that remains heavily widespread in most societies, regardless of the context and culture of belonging[13] (Cain et al., 2023; Meier et al., 2023; Ruin et al., 2023). In this framework, the specific adaptations provided for people with visual impairment in integrated or mixed activities take on an ambivalent value: although they effectively allow the person to participate in the most appropriate manner in the proposed activities, also fostering the development of a sense of group belonging (Atare et al., 2024; Bruyneel & Nightingale, 2024), they simultaneously emphasize the differences between people with visual impairment and their sighted peers. This may foster a sense of inferiority in the former and, on the part of sighted peers, perpetuate a labeling attitude that hinders the full and inclusive acceptance of the individual (Haegele et al. 2023; Ruin et al., 2023).

Research has also highlighted that peer tutoring activities – sometimes conceived as an effective strategy to involve learners and students with visual impairment in integrated or mixed physical activities with sighted peers – have in fact proved to be counterproductive in terms of participation frequency, engagement, and level of performance in motor and sports practice, etc. (Haegele et al., 2024). Specifically, it emerged that imposed tutoring pairings between unfamiliar classmates tend to undermine the sense of self-efficacy and self-esteem of people with visual impairment. As they are assigned exclusively the role of tutee, they constantly feel 'unable,' in need of help, and perceive themselves as creating an additional workload for the peer tutor (Haegele et al., 2024). Alternating roles between tutor and tutee, where possible, could help overcome this critical issue, but is rarely feasible in practice. The outcome is different for tutoring activities that arise spontaneously between pairs of friends: this modality, which usually starts in an entirely informal manner, has been recognized as the most effective, capable of yielding a better result, both in terms of participation and in terms of motor levels and skills (Bruyneel & Nightingale, 2024; Haegele et al., 2024).

In this context, it is necessary to distinguish activities, such as running or biking (tandem biking), in which the practice itself requires the presence of an accompanying person. In these cases, people with visual impairment, regardless of their age, experience, or physical preparation, need a sighted person alongside them for the entire duration of the activity, providing guidance in orientation and movement through space. This form of shared participation, being strictly functional to the practice itself, is accepted by people with visual impairment, who do not perceive it as a denial of their own abilities.

The studies analysed suggest a pivotal recommendation: that investigating the preferences of the people involved is crucial for the success of participation in motor and sports activity (Haegele et al., 2023; Haegele et al., 2024; Ruin et al., 2023). The specific needs, potential, and expectations that people with VI have regarding physical activities should strictly guide the proposals addressed to them, in order

deficits, not only enables the perception of those nearby and the surrounding environment but also guides spatial orientation. The typical settings used for motor and sports practice – regardless of whether they are indoors, like a gymnasium, or outdoors, such as a playing field, running track, or swimming pool – inherently present challenging acoustics due to their conformation and size, creating significant hurdles for people with visual impairment VI. If this is compounded by the presence of many people, an excessively high noise level can be generated. This level of acoustic chaos can cause severe disorientation concerning established auditory reference points, in addition to totally or partially impeding the perception of certain crucial practice-related cues (an approaching ball, a sound indicating an obstacle, etc.).

13 The study by Ruin and colleagues (2023) compares the cultural contexts of three different countries (Austria, Germany, and the United States) which, although sharing a historical, political, and social nature of Western origin, show their own specific characteristics.

to avoid excessive adaptations or providing non-functional adaptations that could discourage participation. Such errors risk undermining self-esteem and sense of self-efficacy, while simultaneously fueling the feelings of inferiority and exclusion that very often characterize their life experience (Haegele et al., 2023; Haegele et al., 2024; Lieberman & Childs, 2020; Opie et al., 2017; Ruin et al., 2023).

Personal contextual factors

Personal contextual factors include variables that specifically relate to the personal characteristics, background, and life context of people with VI. This category also includes gender and family background.

Several studies analysed in this systematic review highlight that belonging to the female gender constitutes, in itself, a barrier which, as supported by intersectional studies (Crenshaw, 1989; 1991), is cumulative to the other barriers previously described. Girls and young women, in fact, register lower levels of motor and sporting activity – both in scholastic and extracurricular settings – compared to their male peers (Demiturk & Kaya, 2015). Furthermore, and likely in correlation to this, they are exposed to a greater risk of suffering episodes of isolation and bullying (Cain et al., 2023).

The family context background plays a crucial role in initiating and supporting – or, conversely, in inhibiting – the participation of individuals with VI in physical and sports activities (Cain et al., 2023; Clements et al., 2024; Haegele et al., 2017). The attention family members pay to physical and social well-being, as well as their attitude of trust and caution, is influential. Overprotection, for instance, sometimes hinders the initiation and practice of physical and sports activity for people with VI (Cain et al., 2023; Clements et al., 2024). Furthermore, and sometimes due to a lack of resources offered by the local area, it may lead to participation in unstructured physical activities that do not require specific equipment or the presence of experts (e.g., walking with a family member) (Haegele et al., 2017).

What competencies must teachers and/or instructors possess to make motor/sports activity inclusive?

Most of the research included in this systematic review focuses on the experiences and perceptions of young people with VI in relation to physical activities practiced inside and outside of school. Their stories often reveal a widespread perception of inadequate preparation of the teaching and/or instructor staff encountered in the various experiences (Alcaraz-Rodriguez et al., 2022; Cain et al., 2023; Holland et al., 2024; Meier et al, 2023; Miyauchi, 2020; Opie et al., 2017; Ruin et al., 2023; Tanure Alves et al., 2018). The main critical issues identified are related to the ability to calibrate and respect learning times, to provide the most appropriate materials and/or adaptations (Alcaraz-Rodiguez et al., 2022; Holland et al., 2024; Opie et al., 2017; Ruin et al., 2023; Tanure Alves et al., 2018), as well as the adoption of excessively protective attitudes, which discourage and completely hinder participation (Cain et al., 2023; Opie et al., 2017). These elements are recognized and declared – in a similar, but specular way – also by the professionals themselves in the only research aimed at collecting their points of view (Miyauchi, 2020). Teachers and instructors often reported the need for consultative or operational support from an external expert (Haegele et al., 2014; Miyauchi, 2020). The chronic lack of professional preparation across the board, which affects mainstream schools, special[14] schools, and, at least partially, extracurricular[15] activities, is the strong, still widespread prejudice that sees physical activity and sports as unsuitable or not a priority for people with VI (Cain et al., 2023; Haegele et al., 2023; Meier et al., 2023; Tanure Alves et al., 2018).

Among the external experts mentioned, not belonging to the school context, there is the Orientation

14 This element, which emerged in particular from the research by Meier and colleagues (2023), would appear to worsen the picture presented so far. It can be assumed, in fact, that the teaching staff of special schools, since the latter are specifically aimed at people with visual sensory impairments, have their own training to respond appropriately to the specific needs of people with visual disabilities and to prepare the necessary adaptations.

15 Here the reference is to all the specific or integrated and mixed motor and sports proposals offered by the area for people with visual impairments, except for the Camps Abilities which are specifically aimed at this target.

and Mobility (O&M) professional. O&M[16] is considered a central component in educational, instructional and training courses aimed at people with visual sensory impairments, as it allows them to develop movement and displacement skills in living spaces. This promoting greater personal autonomy and, consequently, broader and better social participation (Lieberman & Linsenbigler, 2017; Miyauchi, 2020). Interventions in this area are carried out both at the school level – for instance, it is one of the nine areas of the US school Expanded Core Curriculum (Bach, 2021; Caron et al., 2024; Lieberman & Childs, 2020; Lieberman & Linsenbigler, 2017; Opie et al., 2017) – and at extra-school level, such as in the Camp Abilities experiences, where many of the staff are specialized figures in the development of Orientation & Mobility (Caron et al., 2024; Esatbeyoglu et al., 2023; Lieberman et al., 2014). O&M[17] professionals, in addition to working specifically in this direction, are also tasked with providing operational or consultative support to families and teachers (Lieberman et al., 2019; Lieberman & Child, 2020). Therefore, several studies recommend that teachers at all school levels maintain a constant dialogue and collaboration with these practitioners. This partnership allows, on the one hand, for the generalization of motor skills acquired to other contexts (e.g., from school Physical Education activities to family daily life situations or vice versa), stimulating their acquisition and consolidation (Haegele et al., 2015). On the other hand, it helps obtain specialized guidance aimed at promoting a structuring of motor and sports activities that is adequate and consistent with the specific needs of the person involved, through the provision of adaptations and the adoption of effective strategies (Haegele et al., 2014; Lieberman et al., 2019).

6. Conclusions

Motor and sports practice is universally considered fundamental to people's psycho-physical well-being, also thanks to the opportunities it offers for participating in a group or community. However, physical activities inevitably require significant engagement of the visual channel (to move and orient oneself in space, to observe and replicate movements, to grasp and direct balls, other tools, or play objects, etc.), which presents several challenges and critical issues for people with visual impairment. The systematic review presented reflects a keen and widespread interest in the topic, as demonstrated by the number and geographical spread of the published studies. Its objective is to identify the barriers and facilitators capable of promoting access and participation in motor and sports activities for people with visual impairment, also in relation to the skills of teachers and/or instructors.

The studies analysed revealed that the key facilitating factors in promoting physical and sporting activities for people with visual impairment are specific adaptations, that is, adjustments that may affect various aspects of the activity itself. These adaptations, although strictly functional to making physical and sporting activities effectively accessible and to reducing the risk of accidents, are not to be considered a universally valid solution. In fact, these changes may be perceived by the person with visual impairment as excessive, irrelevant, or simply a further element of distinction from the group, thus reinforcing the sense of inequality compared with peers. For this reason, in line with the motto 'Nothing about Us, Without Us' (Charlton, 1998; WHO, 2021b), it is essential to listen to the people directly involved, and to work with them to identify their specific needs, as well as the preferred and most suitable strategies and operational methods for their functioning.

Peer tutoring activities, in cases where pairs were imposed and decided rather than freely chosen, have often proven to be a source of discomfort and a threat to one's self-esteem: always being the tutee confirms one's state of disability, further fueling the specter of isolation and exclusion, and consequently

16 *Orientation* is defined as the "awareness of body in space", and *Mobility* as "the ability to move independently through space" (Southcott & Opie, 2016, p. 23).

17 In line with the established inclusion and exclusion criteria, this systematic review intentionally excluded the numerous emerging studies aimed at investigating the role, perceptions, and dynamics related to Orientation and Mobility (O&M) professionals.

pushing to prefer engaging in motor and sports activities specifically designed only for people with visual impairments, often to be performed individually.

Considering this situation, it is crucial to train teachers and instructors to acquire new, specific knowledge and skills in the field. This must also be done through the presence of specialized professionals, such as Orientation and Mobility (O&M) specialists and related specialized organizations, in order to respond in an increasingly appropriate and effective way to the specific needs of the people they support. In terms of research, it is necessary to move from the perceptions gathered within the class group to broader investigations, continuing to explore the perspectives of families and caregivers, evaluating the learning outcomes achieved (and not only perceptions), and listening to the people directly involved to understand from them which facilitators it would be desirable to activate.

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