# UNVEILING THE RESEARCH LANDSCAPE: A BIBLIOMETRIC ANALYSIS OF SPORT AND DISABILITY RESEARCH

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**Abstract.** Disabled adults confront multifaceted challenges spanning ambulation, cognition, sensory perception, and disease vulnerability. Their susceptibility to cardiovascular conditions, strokes, diabetes, and cancer is tripled compared to non-disabled peers. This study utilized bibliometric analysis to track the evolution of physical activity research in disabilities. This study leveraged the ProQuest database and was aligned with the Convention on the Rights of Persons with Disabilities (CRPD). The analysis encompassed publications from 2008 to 2023. Co-occurrence keyword analysis clustered 492 keywords, linked by 31,005 connections, with a cumulative link strength of 70,025. This study revealed research gaps, notably in exploring the interplay between physical activity and metrics like body mass index (BMI) or velocity in disabled individuals. Moreover, accessibility to activity facilities and injury management for this demographic remain under-addressed. In summary, this bibliometric study offers comprehensive insights into sports and disability studies, urging diversified research, global collaboration, and policy integration to advance inclusivity in sports for people with disabilities.

**Keywords:** disabled person, sports, sports for the disabled, physical activity, accessibility

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## INTRODUCTION

Disability is an inherent part of humanity and an integral human experience. It arises from environmental and personal factors interplay with health conditions such as dementia, blindness, and spinal cord injuries. Currently, it is estimated that 1.3 billion people (16% of the world's population) are living with significant disabilities (WHO, 2023). This number continues to grow due to the rise in non-communicable diseases and increased life expectancy worldwide. Individuals with disabilities comprise a diverse group. Their experiences in life and health requirements are influenced by factors such as gender, age, gender identity, sexual orientation, religion, race, ethnicity, and economic status. People with disabilities experience earlier mortality, poorer health, and more limited daily lives than others (WHO, 2023).

People with disabilities (PWD) are a rapidly expanding population that experiences significant disadvantages. They confront a notably elevated risk, roughly twice that of the general population, for the development of various health conditions, including depression, asthma, diabetes, stroke, obesity, and issues related to oral health (WHO, 2023). This heightened vulnerability underscores the existence of significant health inequities among persons with disabilities. These health inequities are rooted in the unjust conditions experienced by individuals with disabilities, including social stigma, discrimination, economic disadvantage, limited access to education and employment opportunities, and barriers encountered within the healthcare system. They face unremitting barriers to equal and accessible healthcare and a high prevalence of chronic health conditions (Fettes *et al*, 2021; WHO, 2023).

The Convention on the Rights of Persons with Disabilities (CRPD) is a landmark international treaty that underscores the fundamental

rights and dignity of individuals with disabilities. Adopted by the United Nations in 2006, the CRPD aims to promote the full inclusion and participation of people with disabilities in all aspects of society. One of its crucial aspects is addressing the importance of physical activity in the lives of persons with disabilities. The CRPD recognizes that physical activity is not only essential for their health but also plays a pivotal role in enhancing their quality of life (Kanter, 2019; Messing *et al*, 2021; Nkrumah, 2019; United Nations, 2008).

Within the framework of the CRPD, accessibility to sports facilities for disability groups is a significant concern. It acknowledges the need for inclusive design and infrastructure modifications that ensure sports facilities are accessible to everyone, regardless of their physical or cognitive abilities. This inclusivity extends beyond physical access, encompassing a broader understanding of accessibility that includes adaptive equipment, trained personnel, and programming tailored to the specific needs of people with disabilities. Such measures empower individuals with disabilities to engage in sports and recreational activities, fostering not only physical well-being but also social integration and personal fulfillment (Fitri *et al*, 2022; Hayes and Bulat, 2017; Laddu *et al*, 2021; Louw *et al*, 2020; Osuoji, 2019; Sousa *et al*, 2022; United Nations, n.d).

In essence, the CRPD recognizes the vital role of physical activity in the lives of people with disabilities, highlighting the importance of accessible sports facilities to facilitate their participation. By promoting these principles and advocating for their implementation, the CRPD aims to create a more inclusive and equitable world where all individuals, regardless of their abilities, can enjoy the benefits of physical activity and lead fulfilling lives (Al-Harahsheh *et al*, 2022; Messing *et al*, 2021; United Nations, 2008; United Nations, n.d.).

To better understand the evolution of sports for PWD, this paper draws on bibliometric analysis to visualize the research themes and trends. This bibliometric analysis encompasses two key components. Firstly, it aims to scrutinize the emerging trends and topics within publications concerning sports among the PWD. Dissecting publication patterns unveils evolving research themes gaining traction in this field. Secondly, bibliometric analysis also offers the potential to identify future research opportunities linked to sports among the PWD. By pinpointing unexplored research gaps or aspects that have yet to receive in-depth exploration, this analysis provides valuable guidance for researchers to chart forthcoming research directions that could significantly impact comprehending and promoting health through sports for the PWD population.

## MATERIALS AND METHODS

### Study design

The data for this analysis were sourced from the ProQuest database. The publication timeframe spans from 2008 to 2023, aligning with the period covered by the Convention on the Rights of Persons with Disabilities. This strategic selection of years ensures a comprehensive overview of the research landscape concerning physical activity within the context of aging.

The search terms applied to identify the closest matching publication included: “Sport”, “Athletics”, “Disabled person”, “Handicapped”, “People with disabilities”, “Physically disabled”, “Physically challenged”, “Sports for the disabled”, “Adaptive sports”, “Para athletics”, “Para-sports”, and “Wheelchair sports”.

The bibliometric analysis is concerned with the mapping of scientific data. The scientific mapping analysis shows the individual research field or journal's knowledge structure and dynamic organization. The analysis of the present part is mainly based on co-occurrence analysis and time line analysis.

## RESULTS

The primary discoveries of the research are outlined below, organized into categories that align with the study's objectives.

### Descriptive analysis based on bibliometric performance indicators

This type of research involves analyzing publications and bibliographic data to gain insights into the trends, patterns, and relationships within a specific field of study. Co-occurrence keyword analysis clustered 492 keywords, linked by 31,005 connections, with a cumulative link strength of 70,025.

### Keyword analysis (co-occurrence keywords analysis)

This bibliometric analysis study analyzed sports development among PWD-related research published during 2008-2023.

The study identified 492 different keywords that were used in the analyzed research papers and were grouped into five separate clusters or categories. A substantial number of 31,005 links connecting these keywords underscored their intricate interdependence. These connections likely represent relationships between different aspects of the research topics.

The relationships between different aspects of the research topics are further emphasized by the cumulative link strength value of 70,025.

## Research opportunities

Fig 2 visualizes the potential research opportunities. The keywords enclosed within a yellow circle indicate those recently published (in 2022 and beyond), while those marked with a purple hue represent publications from 2020 and earlier. The connections between these keywords become apparent over a specific keyword, showing their co-occurrence in different articles. It is worth noting that some keywords are isolated in this analysis. This approach is a potential way to discover new research directions. Combining seemingly unrelated keywords is an

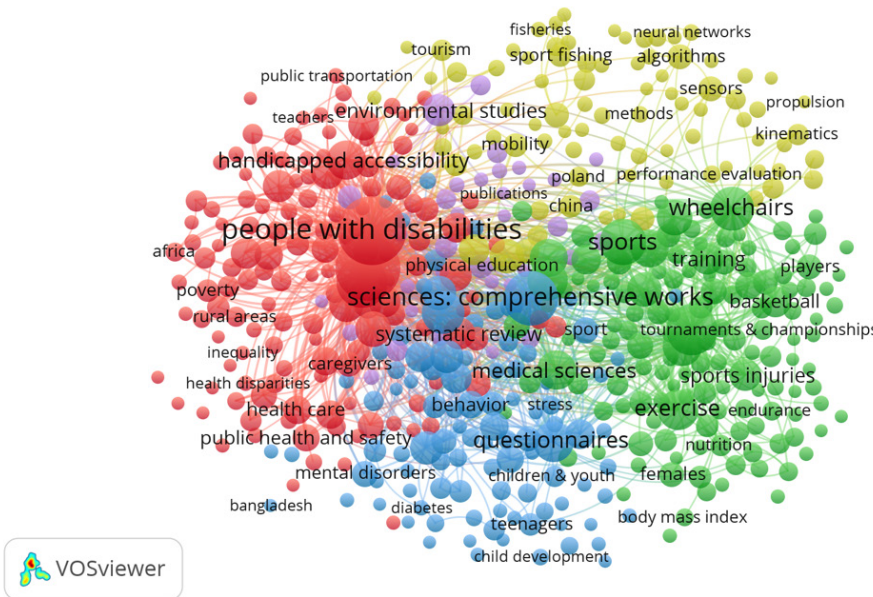


Fig 1 - High-frequency keyword occurrence network in sports among people with disability publications during 2028-2023


Fig 2 - Analysis of further research opportunities on sport and disability research based on overlay visualization

effective strategy for uncovering untapped research opportunities. An example of this concept is demonstrated in Fig 3, illustrating a possible path for future research.

## DISCUSSION

The findings from the co-occurrence keyword analysis offer a comprehensive interpretation of the research landscape. Co-occurrence keyword analysis is used to identify and analyze the keywords that frequently appear in research articles. It helps in understanding the common themes and topics within a body of research. It is found that there are five main themes or clusters of keywords in the research,

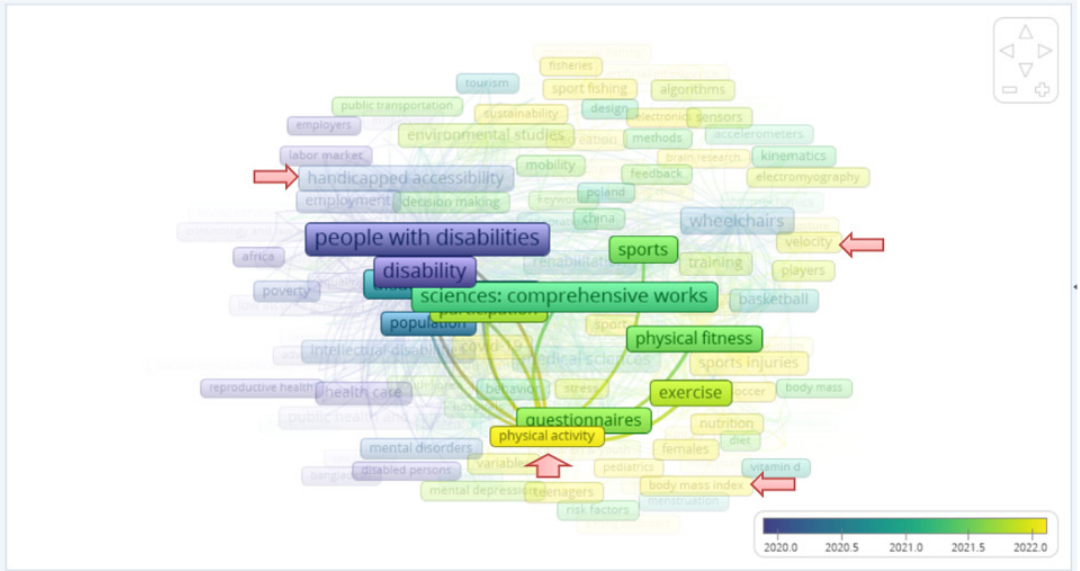


Fig 3 - Further research opportunities on sport and disability research

Note: Red arrows indicate that there has not been enough focus on exploring interactions between physical activity and metrics such as body mass index (BMI) or speed in individuals with disabilities. In addition, accessibility to activity facilities and injury management in this demographic group is still poorly addressed.

suggesting that there are five main themes or topics that researchers have been focusing on in this field. These themes are interconnected with a significant number of relationships between the keywords, indicating a rich and complex body of scholarly work in this area. Furthermore, the cumulative link strength value of 70,025 suggests that the keywords are closely related and interconnected, emphasizing the complexity and interdependence of the research topics within the sports field among people with disabilities. This bibliometric analysis contributes to a deeper understanding of the interconnected nature of research topics, offering insights into the underlying structures and potential directions within the field. In this context, this paper provides significant value to

researchers by giving an insight into the trends and keyword patterns (Puri *et al*, 2023).

Our objective is to provide an extensive overview of possible directions for future research in sports for individuals with disabilities. This is intended to be a valuable resource for researchers deeply committed to this study area. Sport holds immense importance for persons with disabilities (PWD) as it goes beyond physical activity; it fosters inclusivity, empowerment, and improved overall well-being. However, a significant obstacle often faced by PWD is the limited access to sporting opportunities. This limitation denies them the numerous physical and mental health benefits of sports and hinders their social integration and self-confidence (Osuoji, 2019; Pečnikar Oblak *et al*, 2023).

Engaging in sports helps improve physical fitness, enhance coordination, and build muscle strength for PWD, contributing to better overall health. Moreover, it boosts mental well-being by reducing stress, anxiety, and depression, providing an outlet for self-expression, and promoting a positive self-image. Beyond the individual benefits, sports create opportunities for social interaction, friendship, and a sense of belonging, which are crucial aspects of personal development (Park *et al*, 2022; Park, 2021; Shukla *et al*, 2022). Research prospects highlight a significant void in exploring physical activity among the PWD concerning various dimensions. More precisely, there has been insufficient focus on exploring the interplay between physical activity and metrics like BMI or velocity in disabled individuals. Moreover, accessibility to activity facilities and injury management for this demographic remain under-addressed.

Despite these advantages, many PWDs need help accessing sports facilities, adaptive equipment, and trained coaches who can cater to their specific needs. These obstacles can be physical, such as the lack

of ramps or accessible changing rooms, or attitudinal, stemming from misconceptions and prejudice (Al-Harahsheh *et al*, 2022; CDC, 2020; Pečnikar Oblak *et al*, 2023; Sá *et al*, 2012).

Accessibility to activity facilities and injury management for this demographic remain under-addressed. Areas with low numbers and percentages of people with disabilities may lack proximately available disability support services. The accessibility to activity facilities and injury management for individuals with disabilities remains a critical but often neglected concern. Within this demographic, there needs to be a more significant gap in addressing these essential aspects of their well-being. Particularly troubling are regions with lower numbers and percentages of people with disabilities, where the availability of proximate disability support services is notably deficient. This oversight hinders their participation in recreational activities and poses significant challenges when injuries occur (Burridge *et al*, 2023; Fitri *et al*, 2022; Sá *et al*, 2012).

As we strive for a more inclusive society, we must prioritize addressing these disparities to ensure equitable access to essential services for all, regardless of their disability status or geographic location. Recognizing the importance of sports for PWD and actively working to remove these barriers is vital for building a more inclusive and equitable society. By providing equal opportunities and promoting accessibility in sports, we not only improve the lives of individuals with disabilities but also foster a more diverse and integrated community where everyone can thrive (Katikireddi *et al*, 2021; Lakhani *et al*, 2019).

However, this bibliometric analysis has certain limitations. Firstly, it is limited to the ProQuest database, potentially excluding relevant publications from other sources, which could result in a skewed representation of the research landscape and limit the comprehensiveness

of the findings. Secondly, the study's focus on co-occurrence and timeline analyses may require clarification when considering individual publication contexts and variations in research quality. Additionally, selecting keywords for analysis may unintentionally omit emerging or specialized terminologies pertinent to the subject matter. Furthermore, while bibliometric analysis offers quantitative insights, it may not capture qualitative aspects of research, such as the depth of exploration or the rigor of employed methodologies. Moreover, excluding publications before 2008 and after 2023, aligned with the CRPD timeframe, could overlook significant earlier or recent contributions to the field. Lastly, inherent biases in data collection, authorship trends, and publication patterns within the ProQuest database might affect the validity and generalizability of the findings.

Future research stemming from this bibliometric analysis should aim to address the identified limitations, expand the scope of analysis, and deepen our understanding of sports and disability research through both quantitative and qualitative investigations. In addition to the future research directions mentioned earlier, conducting policy analysis for improving accessibility for PWD in public sports and physical activity is an essential area for further investigation. By conducting policy analysis in these areas, researchers and policymakers can work collaboratively to develop and refine policies that promote greater accessibility and inclusion for people with disabilities in public sports and physical activity.

In summary, this study employed bibliometric analysis to delve into physical activity research among the PWD population. The study illuminated this field's dynamic organization and knowledge structure by scrutinizing the publications' landscape and utilizing scientific mapping analysis. The study encompassed co-occurrence and timeline analyses, unveiling trends, relationships, and historical evolution. The keyword

analysis, reflecting 492 items and 5 clusters with 31,005 links, underscored the interconnectedness of themes within the research corpus. Additionally, identifying research opportunities highlighted the underexplored areas of walking activity's impact on heart rate, blood pressure, mental health dimensions, and various physical health aspects among older adults. This study contributes to an enriched understanding of physical activity in aging and identifies potential directions for future research endeavors to bridge existing gaps and foster advancements in promoting health and well-being among PWDs through active engagement.

This bibliometric study offers comprehensive insights into sports and disability studies, urging diversified research, global collaboration, and policy integration to advance inclusivity in sports for people with disabilities.

## ACKNOWLEDGMENTS

This research has received no external funding.

## CONFLICT OF INTEREST DISCLOSURE

The authors declare no conflict of interest.

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