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# The development of various fields of paralympic sports: a systematic review

El desarrollo de diversos campos de los deportes paralímpicos: una revisión sistemática

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**Abstract.** The objective of this research is to describe the evolution of financial support and infrastructure for Paralympic sport, the challenges and strategies associated with this sport, and the technological and innovative developments within it. This type of qualitative research uses a systematic literature review method. The research procedures entail the following steps: compilation of research questions, conducting literature searches through the Scopus database with the help of the Publish or Perish application and Mendeley Desktop with Boolean keywords, screening, and coding selected articles, analyzing and synthesizing selected articles, conducting quality control, namely selected and feasible articles, compiling discussions, looking at the validity and reliability of the data, namely bias correction if less than 20 articles are found, the data will be corrected for bias. The findings of the systematic literature review indicated that: (1) Financial support and infrastructure: interesting studies have found that athletes with disabilities have faced inadequate infrastructure to balance training and work due to insufficient salaries and constraints on transportation aspects; (2) The challenges and strategies employed to address the complexity of issues such as budget constraints, decentralized experience, and personal life. Athletes must be able to communicate effectively, develop detailed plans, create contingency plans, and manage specific expectations. They must also be able to understand the specific roles and boundaries of their coaches and colleagues. Finally, they must be able to trust their coaches; (3) Technology and innovation: A qualitative analysis of the ergonomic aspects of a tool may be considered a contributing factor to the success of wheelchair racing, as evidenced by the analysis of wheel type, rim diameter, and wheel size. The research findings indicated that financial and infrastructural support increased in line with the development and profile of the sport, which in turn led to an increase in funding for the Paralympics. Besides that, technological advancement and innovative approaches have also been employed to enhance the ergonomics of a tool, develop the eHealth concept for the collection of injury reporting data, and conduct fitness analysis that benefits athletes with disabilities.
**Keywords:** Paralympic sports, sports development, systematic review, technology and innovation.

**Resumen.** El objetivo de esta investigación es describir la evolución del apoyo financiero y la infraestructura para el deporte paralímpico, los desafíos y estrategias asociados con este deporte y los desarrollos tecnológicos e innovadores dentro del mismo. Este tipo de investigación cualitativa utiliza un método de revisión sistemática de la literatura. Los procedimientos de investigación implican los siguientes pasos: recopilación de preguntas de investigación, realización de búsquedas bibliográficas a través de la base de datos Scopus con la ayuda de la aplicación Publish or Perish y Mendeley Desktop con palabras clave booleanas, selección y codificación de artículos seleccionados, análisis y síntesis de artículos seleccionados, realización de control de calidad, es decir, artículos seleccionados y factibles, recopilación de discusiones, examen de la validez y confiabilidad de los datos, es decir, corrección de sesgo si se encuentran menos de 20 artículos, los datos se corregirán por sesgo. Los hallazgos de la revisión sistemática de la literatura indicaron que: (1) Apoyo financiero e infraestructura: estudios interesantes han encontrado que los atletas con discapacidades se han enfrentado a una infraestructura inadecuada para equilibrar el entrenamiento y el trabajo debido a salarios insuficientes y limitaciones en los aspectos de transporte; (2) Los desafíos y estrategias empleadas para abordar la complejidad de cuestiones como las limitaciones presupuestarias, la experiencia descentralizada y la vida personal. Los atletas deben ser capaces de comunicarse eficazmente, desarrollar planes detallados, crear planes de contingencia y gestionar expectativas específicas. También deben ser capaces de comprender los roles y límites específicos de sus entrenadores y colegas. Por último, deben ser capaces de confiar en sus entrenadores; (3) Tecnología e innovación: Un análisis cualitativo de los aspectos ergonómicos de una herramienta puede considerarse un factor que contribuye al éxito de las carreras en silla de ruedas, como lo demuestra el análisis del tipo de rueda, el diámetro de la llanta y el tamaño de la rueda. Los hallazgos de la investigación indicaron que el apoyo financiero y de infraestructura aumentó en línea con el desarrollo y el perfil del deporte, lo que a su vez condujo a un aumento en la financiación para los Juegos Paralímpicos. Además de eso, también se han empleado avances tecnológicos y enfoques innovadores para mejorar la ergonomía de una herramienta, desarrollar el concepto de eSalud para la recopilación de datos de informes de lesiones y realizar análisis de aptitud física que beneficien a los atletas con discapacidades.
**Palabras clave:** Deportes paralímpicos, desarrollo deportivo, revisión sistemática, tecnología e innovación.

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## Introduction

Studies in sports science encompass a wide range of topics that require continuous exploration to provide updated insights (Yudhistira et al., 2021; Yudhistira & Tomoliyus, 2020). Among the prominent international sporting events, the Paralympics, which specifically caters to athletes with disabilities, stands out for its unique contributions to the sports world (McNamee, 2017). The key distinction between the Olympics and the Paralympics lies in the participants; Paralympians are athletes with disabilities, either congenital or acquired due to accidents (Yulianto & Yudhistira, 2021).

Paralympic sports cover a wide range of disciplines such as archery, swimming, cycling, and wheelchair tennis (International Paralympic Committee, 2018). To accommodate the unique needs of disabled athletes, modifications are made to both the facilities and rules, ensuring accessibility and fairness in competition (Fitri et al., 2021; Duvall et al., 2021). Athletes are classified into six primary categories based on their disabilities: cerebral palsy, amputation, spinal cord injury, visual impairment,

intellectual disability, with further sub-classifications based on the severity of the condition (Jaeken, 2020).

Over the past 50 years, the Paralympic movement has seen significant growth, becoming a landmark event for athletes with disabilities. Since its inception in Rome in 1960, the Paralympics has expanded to involve 160 countries and more than 4,300 athletes by 2016 (Pinheiro et al., 2021). This international platform highlights that athletes with disabilities are equally capable of achieving extraordinary feats in the sports arena, challenging traditional notions of athleticism.

Participation in sports offers numerous benefits for individuals with disabilities, including improved physical fitness, enhanced quality of life, increased social inclusion, and greater self-efficacy (Subagio et al., 2024). However, many individuals with disabilities still face social stigmas, leading to feelings of inferiority and hindering their ability to fully realize their potential. Despite these barriers, individuals with disabilities possess the same capacity for personal growth and athletic achievement as their non-disabled counterparts.

Individuals with disabilities may encounter limitations in adaptive skills and social interactions, which can influence their decision-making and goal-setting abilities in sports (Raharjo et al., 2023). Despite these challenges, athletes with disabilities are driven to overcome obstacles and unlock their full potential. Furthermore, the growth of disability sports is not only about individual achievement but also plays a significant role in driving economic development.

Hosting major sporting events such as the Olympics and Paralympics positively impacts the economy by promoting tourism and showcasing local cultural attractions (Misener et al., 2013). These events contribute to the development of recreational sports tourism, allowing visitors to experience the unique atmosphere of the host cities. Hence, the benefits of sports extend beyond individual participants, influencing broader economic aspects.

The development of sports, especially for sports with special needs, is increasingly growing here. However, a comprehensive study is needed to analyze that Paralympic sports have developed. Related to this development can actually be felt and many have studied from various original studies such as research from Anderson related to the involvement of adolescents in disability sports with the main study of implications for identity development, in this study aims to examine the development ofthe identity of adolescent girls with disabilities to participate in organized wheelchair sports with the result that through sports adolescents with disabilities can find their hobbies and actively participate insports and social activities (Anderson, 2009).

The previous study focused on the development of sports for people with disabilities in 1978- 2008, stating that the Paralympics held in Beijing in 2008 had a positive impact on Chinese society outside of sports. The organization of the Sports Association of People with Disabilities in China in 1983 and the Federation of People with Disabilities in 1988 were established and the Sports Law ofthe Republic of China in 1995 has supported sports for the disabled and elderly. Government policies have supported fitness programs, and special policies, new sports facilities, national games, recreational activities and sports participation for athletes have been supported. The rapid economic development in China provides good support for disability sports (Shuhan et al., 2011).

Another study critically analyzed that the single most important thing in sports performance is good coaching. While historically sport for people with disabilities has lacked coaching, and countriessuch as Canada, the UK and the US have benefited from quality coaching, it is important to highlight that many athletes around the world still lack attention. However, coaches have adapted to the unique issues of disability sport including understanding their athletes, providing accessibility solutions and organizing logistics. There is limited research on disability sport coaching practices, but it has been shown that coaches can influence the psychological well-being of their athletes in terms of motivation, confidence and satisfaction. Future research directions should seek to analyse the determinants of good and effective disability sport coaching practices, such as understanding how coaches influence the short- and long-term development and direct performance of their athletes (Martin & Whalen, 2014).

The description of the research above explains that disability sports coaching is still lacking attention, meaning that there is still a gap in coaching. In addition, it is explained that the direction of research should refer to how coaches are able to have a positive impact on their athletes, then how to carry out more effective coaching. In addition to other studies stating that Chinese society haspreviously ignored and underestimated the international disability movement as an educational process, this study has interpreted why disability sports after being introduced in China receivedstrong support from the government. The key to the success of disability sport lies in government support. As a result, elite disability sports performance has flourished. However, there is an imbalancebetween sport and real needs that needs improvement for the future (Guan & Hong, 2016).

The growing effort to provide solutions for coaching athletes with disabilities, however, has so far failed to engage in disability studies, resulting in missed opportunities to develop critical analysis of coaches' learning and practice in disability sport. Disability studies and models are an important step in critical understanding for disability sport coaching. Disability models provide a lens through which coaches and researchers can question how to coach athletes with disabilities and critically evaluate disability coaching practice. Critical understanding has the potential to develop different and sophisticated ways of thinking to develop sport coaching for people with disabilities (Townsend et al., 2015). Based on previous studies, disability sports still lack special attention. In

addition, to optimize the development of disability sports, strong support for the government is needed. Studies on disabilities are still wide open for study, there is still a need for a lot of research to cover the gaps of previous studies. Especially in Indonesia, research related to disability gives an interesting impression to the author, quite a lot of research related to sports but still only examines related to normal sports. Therefore, there are still not many who are interested in conducting research on sports with disabilities, especially research related to systematic review analysis that discusses the development of athlete participation and achievement.

Looking at the current number of publications, it is certainly not easy for the author to conclude that sports for people with disabilities have grown rapidly in terms of participation and achievement. A good scientific study is needed to analyze and draw conclusions. Literature review is one of the best designs to provide empirical evidence. Research with the type of literature review is more specifically very useful for synthesizing the findings. The results of relevant research, in this case the facts presented to policy makers are more balanced and comprehensive.

Systematic literature review research involves relevant research as a basis for review toprovide good information based on empirical data. Systematic literature review as a research study is used to synthesize research results so as to obtain a strong quantitative blend of data (Hasnah, 2016). Based on the description above, the author is interested in conducting research with the title "research analysis in the development of Paralympic sports in 2008-2022: a systematic review study in the perspective of the development of participation and achievement, the development of financial support and infrastructure, and the development of challenges and strategies, technology and innovation". It is hoped that this research will contribute to academics to enrich scientific insights and for practitioners to see how the development of disability sports from 2008-2022.

## Methods

Systematic literature review has two approaches, namely quantitative and qualitative types. AtThis research used a qualitative type approach, in more depth the systematic type of qualitative literature review is divided into two, namely ethnography and aggregation. The qualitative type usedis aggregation, which answers research questions by summarizing various research results (Siswanto, 2010a).

This research was conducted using secondary data sources through the *Scopus.com* database collected through articles in reputable journals from 2008 to 2022. The data collection technique inthis study went through the PRISMA *Preferred Reporting items for Systematic review and Meta- Analysis Protocols* (Gebreslassie et al., 2020) with the following qualitative steps:

### *Determining Research Question*

This means that the research questions and objectives must be determined in advance to facilitate the course of this research. In addition, to make it easier to find relevant articles in the journals that have been determined. (Retnawati et al., 2018).

### *Conduct Relevant Literature Search*

Search for relevant articles in international journals. Search for articles with the keywords Paralympic sports development and disability sports. Then determine the inclusion and exclusion criteria. Then for the database search used is scopus.com fiber assisted with the Publish or Perish (POP) application with a literature search by applying Boolean keywords "AND, OR". The Boolean keywords used are as follows:

a. History AND evolution AND paralympics AND sports
b. Participation AND achievements AND paralympics AND sports
c. Technology AND innovation AND paralympics AND sports
d. Paralympic AND beijing OR china AND sport AND disability
e. Paralympic AND vancouver OR canada AND sport AND disability
f. Paralympic AND london OR united AND kingdom AND sport AND disability
g. Paralympic AND sochi OR russia AND sport AND disability
h. Paralympic AND brazil OR rio AND sport AND disability
i. Paralympic AND pyeongchang OR pyongyang OR korea AND sport AND disability
j. Paralympic AND tokyo OR japan AND Beijing OR China AND sport AND disability

However, when the documents in the database cannot be downloaded in full, the type of book,methods outside of qualitative are certainly not included in the coding, meaning the exclusive criteria (KE). Inclusion criteria (KI) as follows:

a. KI1: Original research written in English
b. KI2: Research with qualitative methods
c. KI3: Research that addresses participation and achievement
d. KI5: Research that addresses financial and infrastructure support
e. KI6: Research that addresses technology and innovation

### *Screening and Coding Articles*

The purpose of coding is to make it easier to distinguish one article from another that isclassified into inclusion and exclusion criteria.

***Analyze and Synthesize Selected Articles***

At this stage the author has found relevant articles and has done screening so that the author will conduct a qualitative synthesis and evaluation analysis with an aggregative approach, namely answering research questions with summarized research results (Siswanto, 2010b).

***Enforcing Quality Control***

Enforcing quality control means ensuring the literature and literacies used are relevant and well accounted for (Koyongian et al., 2021a).

***Compile Final Report***

The final stage is to compile the final report by presenting the systematic review report in the form of a scientific article (Koyongian et al., 2021b).

***Data Validity and Reliability***

Validity is the validity and reliability is the consistency of a tool or instrument to measure a subject. In literature review research, bias correction is used if the sample found is less than 20.

## Results

The systematic literature review type of research in this study collected and searched for previous articles through the Scopus journal database. The next stage the author filters the articles to remove double articles and those that are not in accordance with the relevance of the research topic so as to get articles totaling 1,093. In the next step, the author filtered again to see the relevance in detail, so that there were 947 articles that met the criteria and 759 that did not. The next stage the author conducts screening again, so far there is still relevance to the topic so that the number of articles stays at 947. The next stage conducts screening again with full text and data analysis in qualitative research so that 99 complete articles are found. The next stage the author conducted screening again with qualitative analysis criteria for original articles so that 24 articles were obtained. The 24 articles that have been selected based on eligibility and completeness, then synthesize with the metasynthesis method. The method used is grouping the data that has been filtered and then examined in depth with the population, intervention, comparison and outcomes (PICO) technique. The results of the study can be presented in the following discussion:

Table 1.
Systematic Research Results of Literature Review Based on PICO Analysis

| No. | Name | Title | Methods | Population | Intervention | Comparison | Outcomes |
|---|---|---|---|---|---|---|---|
| 1. | (Aitchison et al., 2020) | Life experiencesand social support of swimming athletes: Study qualitative | Qualitative | Disabled athletes | No | No | Exploration of life experiences of paralympic swimmers.Athletes need support, and wellbeing to optimize competitive performance. |
| 2. | (Bastos etal., 2020) | Perspectiveathletes onthe importanceof preparationand psychologyexperience sports | Qualitative | Disabled athletes | No | No | Results show that athletes are willing to get involved toprepare for psychology skills. |
| 3. | (Becerraet al., 2019) | Perception wheelchair rugby athlete for practice sports that customized | Qualitative | Disabled athletes | No | No | The most frequently mentioned support for sports training that is customized refers to thefamily context. In a sporting context, there is support from the club, the team, the staff,the coach, the team, with appreciation against the training room. |
| 4. | (Brooke & Khoo, 2021) | A sporting perspective on the sustainability of the Malaysian and Singaporean Paralympics | Qualitative | Disabled athletes | No | No | Promote the sustainability of the movement through funding and educational campaigns, community liaison and cultural endeavors within the community. |
| 5. | (Bundonet al., 2018) | Athlete career experiencedisability influencedby career | Qualitative | Disabled athletes | No | No | Retirement in sports is inevitable, but preparations for retirement must be made. Need support from psychologists and practitioners in order to provide motivation. |
| 6. | (Bundonet al., 2017) | Expert perceptionof wheelchair settings racing | Qualitative | Disabled athletes | No | No | Qualitative finding that providing advice and projects on wheels, tires and bearings for wheelchair racing |
| 7. | (Cardosoet al., 2018) | Financialsupport for Paralympic athletes eBrazil | Qualitative | Disabled athletes | No | No | Financial supportindicated that it is fundamental to usefulness and achievement progress |
| 8. | (Cardosoet al., 2020) | Paralympic athlete entrye braazil for highest performance | Qualitative | Disabled athletes | No | No | The main reasonsathletes start Paralympic sportsare for training access, training enjoyment, being inspired by idols |
| 9. | (da SilvaMusa et al., 2021) | Impact exercise and learningsports professionalsHandball: Covid-19 and coach | Qualitative | Coach | No | No | Results stated that the trainer's concernto maintain the athlete's performance during the covid-19, the |

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| | | | | | | | uncertainty of the team'sfuture, resourceconstraints fortraining |
| 10. | (de Cruzet al., 2019) | Related implicit beliefs disability and elite sports: athlete experience disability | Qualitative | Disabled athletes | No | No | Adaptation andstrategy adjustments to overcome setbacks, the process of accepting limitations, increasing efficacy self and competence to increase belief |
| 11. | (de Souza& Brittain, 2022) | Paralimpiade rio 2016: visibility in Brazil as a possiblelegacy | Qualitative | Community participants | No | No | The Paralympic Games have not only changed society's perception and status of disability. It is a more complex set of actions that contribute to this process. |
| 12. | (De Souza et al., 2020) | Paralympic games: The experience with "the other" through the screens | Qualitative | Undergraduate student | No | No | That direct and indirect contact with different groups can be a tool for reducing prejudice. |
| 13. | (Dehghansai et al., 2021) | Challenges and stressesexperienced by athletes and coachesleading up to the Paralympic Games | Qualitative | Disabled athletes & Coaches | No | No | Through detailed planning, effective communication, contingency plans) and managing expectations, understanding specific roles and boundaries, focusing on processes. |
| 14. | (Fagher etal., 2017) | An e-health application of self-reported sports-related injuries and illnesses in paralympic sport: Pilot feasibility and usability study | Qualitative | Disabled athletes | No | No | The eHealt application is feasible to use with some revision requirements, namely improving it can be used for disabilities. |
| 15. | (Fagher, Kunorozva, et al., 2022) | Safe and Healthy Para sport project (SHAPE): A study protocol of a complex interventionwithin para-sport | Qualitative | Disabled athletes | No | No | Evaluation of health promotion web platformfor paralympic athletes with disabilities |
| 16. | (Fitri et al., 2022) | Accessibilit y of Inclusive Sports Facilities forTraining and Competition in Indonesia and Malaysia | Qualitative | Disabled athletes | No | Analysis of Malaysia and Indonesia | Practice and match accessneeds to be optimized |
| 17. | (Haiachiet al., 2018) | Different views of (dis)ability: Sport and itsimpact on the lives of women athletes withdisabilities | Qualitative | Disabled athletes | No | No | Involvement in sports, relationships social, and independence |
| 18. | (McMaster et al., 2012) | Coaches of athletes witha physical Disability: A look attheir learning experiences | Qualitative | Disabled athletes | No | No | The three major influencing themes are biography, how to chooseto learn, learning opportunities |
| 19. | (Moura etal., 2021) | Parent's perception of children's participation in School Paralympics Games in the state of Roraima/Brazil | Qualitative | Disabled athlete's parents | No | No | Sociability, health and psychological enhancement, the main contribution of children with disabilities to the Paralympics, have widened the participation of students with disabilities. |
| 20. | (Olsen etal., 2019) | Content andfeature preferences for a physical activity app for adults with physical disabilities: Focus groupfindings | Qualitative | People with physical disabilities | No | No | The main interest inhaving a fitness appdesigned for physical disabilities, thusthe features of tracking apps are relevant to athlete communities. disability |
| 21. | (Pack et al., 2017) | "I think I became a swimmer rather than just a swimmer. someone with a disability swimming up and down:" paralympic athletes perceptions of self and identity development | Qualitative | Disabled athletes | No | No | Exercise improves ability, motivation, and self-concept a person. Rehabilitation professionals can alsouse exercise as a technique to help withone's motivation, self-motivation and sense of normality. |
| 22. | (Saint- Martin et al., 2020) | Mental preparationof Olympic and paralympicswimmers:Performance-related cognitions and emotions, and the techniques used to manage them | Qualitative | Paralympic swimmer | No | No | Our findings suggest that different patterns of cognition and emotion are associated with swimmers' best and worst performances, which are influenced by their beliefs about preparation during the season. These findings support the use of individualised and task-specific mental preparation programmes to help athletes identify and manage cognitive and emotional dysfunction and elicit adaptive behaviours. |
| 23. | (Souza &Brittain, 2022) | The Rio2016 Paralympic Games: inspiration as a possiblelegacy for disabled Brazilians | Qualitative | 24 disability rights activists | No | No | They also provide inspiration for non-disabled people (NDPs), as examples of athletes 'overcoming' their disability and associated environmental and social barriers motivate people to reconsider their own realities. Although some participants criticized the hero/superhero narrative, most argued that it is also common among NDPs and that DPs should not be |

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| | | | | | | | treated differently. For them, these narratives still have positive potential. |
| 24. | (Szabo &Kennedy, 2022) | Practitioner Perspective of athletes recovery in paralympic sport | Qualitative | 15 sports practitioners | No | No | These results highlight how a humanistic approach to treatment, coupled with individual athlete expertise, comprehensive education and consideration of underlying lifestyle factors, is essential for the recovery of para-athletes. |

*Financial and Infrastructure Support*

Understanding this, the author argues that policy makers need to pay attention to thesurvival of athletes with disabilities. Classic problems such as not getting a decent award, notguaranteeing life, and still having doubts about survival are one of the complaints as athletes with disabilities. The first step that needs to be considered is how athletes with disabilities when getting bonuses and awards can invest and establish businesses or open employment opportunities in the fieldof sports such as sports shops, consulting and so on. In addition, in terms of achievement in studies in Brazil that show good improvement from the aspects of managers, coaches and organizations so that recently shows the rapid development of achievements in every competition.

In addition, the creation of optimal achievements is certainly supported by adequate financial infrastructure. This means that the creation of achievements cannot be separated from internal and external aspects. Internal is self-motivation, while external is the human resources of coaches, managers, synergy of organizational elements, infrastructure and established finances.

Accessibility of training and infrastructure for athletes with disabilities needs to be equalized with the sports of normal athletes. Seeing this can make corrections for evaluation material policy makers so that they can provide an optimal solution for athletes with disabilities. In addition, ofcourse, it provides an understanding and is necessary to achieve fair sports, the principle of holiness, fairness, prosperity for people with disabilities in order to provide better achievements.

*Challenges and Strategies*

The findings above according to the author are relevant strategies, given that the match is insight. One of the main keys that the author can take is the effective communication of coaches and athletes, because effective communication minimizes misunderstandings and increases trust between coaches and athletes. Apart from this, in their disabilities athletes must be different to be able to communicate with the coach. But in this case the coach must be pro-active to understand athletes withdisabilities. In addition, motivation and goals are important. Setting short, medium and long term goals is a plan and a view of what will be done after completing these goals.

Looking at the study above that injuries in sports are indeed familiar things, but in this case the approach to healing when athletes with disabilities are injured is different from normal athletes. Observed when athletes with disabilities experience injuries physiotherapy needs to emphasize a reflective and special approach with these athletes. Then emphasizing a humanistic attitude in healing is very important in healing athletes with disabilities. As counseling is the most important factor besides medical and sciences healing. In addition, strategic performance evaluation in disability sports needs an abstract approach by examining psychological aspects in the study of sports psychology.

*Technology and Innovation*

One of the efforts to develop innovation in supporting the performance of athletes with disabilities, especially wheelchair racing. Highlighting this, the author can see that development only discusses how the product is made with development research methods and tested experimentally, but uniquely the study above talks about ergonomic aspects in the study of wheelchair racing. This is an intellectual innovation to support disability sports performance. This means that by conducting thematic qualitative analysis, the scientist can create concepts such as examining the wheels, rims andinteractions with the coach. Of course, this does not rule out the possibility of being analyzed with aspects of biomechanics that perform motion analysis to make it more effective and efficient.

A very interesting study and provides good benefits for athletes with disabilities, technology and information are one of the benchmarks that sport is advanced or not, when technology and information are adequate, of course, it will provide extraordinary convenience and benefits for people with disabilities. Given that access to anything is now by online, of course in sports can be developed more sophisticated as a realization of the progress of sports, especially for athletes with disabilities.

## Discussion

An interesting situation, Malaysian paralympic athletes have faced inadequate infrastructure so as to balance training and work because the salary earned is not enough and constraints in the transportation aspect (Brooke & Khoo, 2021). In contrast to the current situation, Singaporean and Malaysian pre-Olympic athletes receive the same rewards and intensive as normal athletes. In addition, they receive free medical treatment and a sufficient monthly allowance (Brooke & Khoo, 2021). These regulations provide equal rights and financial support for Olympic and Paralympic athletes. Furthermore, infrastructure in Southeast Asian countries for people with

disabilities has improved (Brooke & Khoo, 2021). In 2020, the UK, Malaysia and Japan had the highest number of photos and articles on the Rio 2016 Paralympics (Brooke & Khoo, 2021). This shows that the Paralympics can improve attitudes towards people with disabilities, namely to change the old assumptions of people with disabilities (Shirazipour et al., 2023; Coates & Vickerman, 2016; Ferrara et al., 2015; Blauwet & Willick, 2012).

The Singapore and Malaysian governments have set a rule that 1% of people with disabilities can work in the public sector, and can then receive financial support to employ people with disabilities. This is certainly a positive step for the disabled community, but still needs to be revised to develop sustainable corporate social responsibility strategies in these countries (Brooke & Khoo,2021). Lower career progression and challenges in finding a job, but still able to improve company image and work ethic. This can be improved but needs limited support compared to countries such as the UK, China and the US (Brooke & Khoo,2021).

It has also been found that most disabled athletes leave sport for the same reasons as normal athletes, certain reasons such as declassification, have difficult transition experiences and do not benefit from additional support (Gurgis, et al., 2022). Indeed, understanding the retirement experience allows psychologists and practitioners to provide more support to athletes with disabilities (Bundon et al., 2018).

The development of paralympic sports in Brazil is increasing rapidly every day (Cardoso et al., 2018). The performance of coaches and managers has been satisfactory in the success of paralympic sports (Alexander et al., 2024). Then the performance of athletes in the paralympic scene is arguably surprising in every competition (Cardoso et al., 2018). This is inseparable from strong financial support for career development. Financial support for paralympic athletes in Brazil, Bolsa Podio holders need adequate financial support (Cardoso et al., 2018).

A study by (Fitri et al., 2022) has compared disability sports accessibility for training and competition in Malaysia and Indonesia. The study highlighted that research related to accessibility for training and competition in the study of athletes with disabilities is more research in countries thathave high income. Of course, this situation is different with countries that have low and middle income (Martin Ginis et al., 2021). One of these countries is Indonesia and Malaysia (Oggero et al., 2021; Fitri, et al., 2021). These two countries are home to around 80% of people with disabilities. These two countries were chosen because they support disability sports such as hosting regional events such as the ASEAN para games or Asian para games (Fitri etal., 2022). In their study related to access to training facilities for athletes complained that walking paths are usually blocked, there are trees in the middle of pedestrians, many potholes and cracked sidewalks, often athletes fall into corners because of potholes. Access to training equipment such as power lifting and goalbal sports in Malaysia and Indonesia claimed not to have special training facilities for people with disabilities. In addition, such as bocia and blind soccer in Malaysia statedthat they need facilities that meet the standards for athletes (Fitri et al., 2022).

The thematic study on the analysis of coaches' and athletes' strategies at the Tokyo Paralympic Games on the issues of budget constraints, decentralised experiences, different athletes with disabilities, personal lives such as moving cities to access training, postponing school and college, isolation from social environments and uncertainty due to Covid-19, accreditation and qualification (Dehghansai et al., 2021). Athletes and coaches were able to overcome these issues through effective communication, detailed planning, contingency plans and managing expectations, such as understanding specific roles and boundaries, trust between coaches and athletes was key to better understanding how athletes' weaknesses interacted with the competitive environment, tailoring support to each athlete's needs, and athletes reflected on the pressures of the Olympics as performance affected post-Tokyo careers and some athletes considered retirement (Davis et al., 2019).

Structured interviews by practitioners working in disability sports, through thematic analysis to optimize athletes' recovery from injury, namely (1) emphasizing simple concepts, (2) knowing athletes individually, (3) experience problems, (3) muscle factors, (4) non-training loads. A humanistic approach to treatment, extensive education, plus individual athlete expertise and considering life events are essential for the recovery of athletes with disabilities (Szabo & Kennedy, 2022).

Other study findings related to the identification of cognitions, emotions and the exploration of psychological techniques to manage the process and during best and poor performances. Seven pre- Olympic and five Olympic swimmers participated. Functional cognitions and pleasant emotions were frequently reported when performing at their best. Athletes used breathing, imagery, music, self-talkto manage cognitions and emotions. This means that different patterns of cognition and emotion are associated with best and worst performances. This is why the use of individualized and specificmental training programs is necessary to identify cognitive and emotional dysfunctions and elicit adaptive behaviors (Saint-Martin et al., 2020).

The aspect of disability sport is a unique study that is certainly worthy of investigation, especially athletes who experience different challenges from normal athletes to achieve achievements in sports (de Cruz et al., 2019). Seeing developments and innovations in disability sports is certainly inevitable. It can be seen that sports scientists in the study of wheelchair athletes that the determinants of victory in the match are influenced such as the wheelchair, the athlete himself and the interaction with the coach (Bundon et al., 2017; Ramsdon et al., 2023). Previous studies have been limited to analyzing the physiological performance of wheelchair racing athletes, but other

aspects such as the ergonomics of wheelchair racing have not been assessed (Bundon et al., 2017). It has been highlighted that some key aspects such as rim diameters, wheel sizes are certainly interesting to study (Bundon et al., 2017). The study of wheelchair racing ergonomics that examines qualitatively in the aspect of the wheelchair is one of the studies that not many researchers use (Bundon et al., 2017). Usually, qualitative research is only used to discuss anthropological and sociocultural aspects, but it turns out that with in-depth discussion and a sexy impression in this study, it can look at the qualitative side comprehensively (Aspers & Corte, et al., 2019). Furthermore, these new ways can be developed and gained expertise and can be used to inform advances in the field of disability sport science (Bundon et al., 2017).

Sports participation is often associated with sports injuries (Wang et al., 2024; Al-Qahtani et al., 2023; Hassett et al., 2024; Dupuy et al., 2024). However, there is little discussion about the prospective injuries and illnesses experienced by athletes with disabilities at the Paralympics. In fact, technological advances such as mobile phones and network systems provide an open space to develop eHealth tools as an innovation to collect injury and illness data reports for athletes with disabilities. The eHealth application as a routine data collection has been developed and adapted for Paralympic athletes (Fagher et al., 2017). The eHealth application for injury reporting data collection is feasible to use provided that adaptations to accommodate athletes and improve techniques can be used with visual impairments (Fagher, Baumgart, et al., 2022; Fagher et al., 2017; Fagher, Kunorozva, et al., 2022).

Thousands of smartphones have circulated in the world, this certainly affects performance in daily activities, such as making work easier and time efficiency. However, in the field of sports, especially for people with disabilities, there are still not many such concepts developed (Olsen et al., 2019). Olsen et al have conducted a needs analysis to develop a tool with research participants who areathletes with disabilities have stated (1) sports applications that are specialized or can be searched basedon disability, (2) are easily accessible and simple to use, (3) providing experience profiles, (4) features that provide games that have elements of chalenges for yourself and others, (5) social features to connect and be able to interact with other users. (Olsen et al.,2019).

## Conclusion

This systematic review offers important insights into the development of Paralympic sports across several key dimensions.

First, financial support and infrastructure remain highly uneven across different countries. While some nations, such as Singapore, provide comprehensive support to their Paralympic athletes, others, like Malaysia, continue to face significant challenges in providing adequate infrastructure and financial rewards. These disparities point to the need for more consistent global policies that ensure all athletes with disabilities have access to the resources they need to succeed.

Second, challenges and strategies for overcoming the barriers faced by Paralympic athletes are multifaceted. Athletes and coaches must navigate a wide range of obstacles, from limited access to training facilities to psychological stressors related to injury recovery and performance pressure. Effective communication between coaches and athletes, along with well-planned strategies, has proven essential in managing these complexities.

Third, technological innovations are critical to enhancing Paralympic performance. Advancements in wheelchair design and other assistive technologies, as well as the development of eHealth tools for tracking athlete injuries, are helping to bridge some of the gaps in athlete care. However, these technologies remain inaccessible in many lower-income countries, highlighting the need for more equitable distribution of resources.

Beyond these operational aspects, a critical perspective on the Paralympic movement is necessary. The Paralympics, while offering a platform for athletes with disabilities, often reinforces the medical model of disability, which focuses on impairment and physical limitations. This model should be reevaluated, and future research should explore how a shift towards the social model of disability—which emphasizes empowerment, inclusion, and societal change—can better support the long-term development of Paralympic sports (Guan & Hong, 2016). By moving beyond the medical model, Paralympic sports can serve as a catalyst for broader societal transformation, not just in terms of athletic achievement but also in terms of social justice and inclusion.

In conclusion, while significant progress has been made in the development of Paralympic sports, there is still a need for more inclusive policies, equitable resource distribution, and a shift towards a more empowering framework for athletes with disabilities. The findings from this review offer a foundation for future research and policy-making that prioritizes the needs and potential of athletes, moving beyond traditional models of disability towards a more inclusive and socially just future for Paralympic sports.

## References

Aitchison, B., Soundy, A., Martin, P., Rushton, A., & Heneghan, N. R. (2020). Lived experiences of social support in Paralympic swimmers: A protocol for a qualitative study. *BMJ Open*, *10*(9), e039953. https://doi.org/10.1136/bmjopen-2020-039953

Al-Qahtani, M. A., Allajhar, M. A., Alzahrani, A. A., Asiri, M. A., Alsalem, A. F., Alshahrani, S. A., & Alqahtani, N. M. (2023). Sports-Related Injuries in Adolescent Athletes: A Systematic Review. *Cureus*, *15*(11). https://doi.org/10.7759/cureus.49392.

Anderson, D. (2009). Adolescent girls' involvement in disability sport: Implications for identitydevelopment. *Journal of Sport*

*and Social Issues*, *33*(4), 427-449. https://doi.org/10.1177/0193723509350608

Aspers, P., & Corte, U. (2019). What is Qualitative in Qualitative Research. *Qualitative Sociology*, *42*(2), 139-160. https://doi.org/10.1007/s11133-019-9413-7.

Bastos, T., Corredeira, R., Probst, M., & Fonseca, A. M. (2020). Elite athletes' perspectives on the importance of psychological preparation and personal experiences with sport psychology. *European Journal of Adapted Physical Activity*, *13*(1), 1-13. https://doi.org/10.5507/EUJ.2020.001

Becerra, M. A. G., Manzini, M. G., & Martinez, C. M. S. (2019). Perception of rugby athletes on wheelchairs on supports received for an adapted sport practice. *Brazilian Journal of Occupational Therapy*, *27*(3), 615-627. https://doi.org/10.4322/2526-8910.ctoAO1662

Blauwet, C., & Willick, S. E. (2012). The Paralympic Movement: using sports to promote health, disability rights, and social integration for athletes with disabilities. *PM & R : the journal of injury, function, and rehabilitation*, *4*(11), 851–856. https://doi.org/10.1016/j.pmrj.2012.08.015.

Brooke, M., & Khoo, S. (2021). Insider perspectives on the sustainability of the malaysian and singaporean paralympic movements. *Sustainability (Switzerland)*, *13*(10). https://doi.org/10.3390/su13105557

Bundon, A., Ashfield, A., Smith, B., & Goosey-Tolfrey, V. L. (2018). Struggling to stay and struggling to leave: The experiences of elite para-athletes at the end of their sport careers. *Psychology of Sport and Exercise*, *37*, 296-305. https://doi.org/10.1016/j.psychsport.2018.04.007

Bundon, A., Mason, B. S., & Goosey-Tolfrey, V. L. (2017). Expert users' perceptions of racing wheelchair design and setup: The knowns, unknowns, and next steps. *Adapted Physical Activity Quarterly*, *34*(2), 141-161. https://doi.org/10.1123/apaq.2016-0073

Cardoso, V. D., de Castro Haiachi, M., Filho, A. R. R., & Gaya, A. C. A. (2018). Financial support forparalympic athletes in Brazil. *Journal of Physical Education (Maringa)*, *29*(1). https://doi.org/10.4025/jphyseduc.v29i1.2963

Cardoso, V. D., de Castro Haiachi, M., Filho, A. R. R., & Gaya, A. C. A. (2020). Entry of Brazilian paralympic athletes in high performance sport. *Journal of Physical Education (Maringa)*, *31*(1). https:/doi.org/10.4025/jphyseduc.v31i1.3151

Coates, J., & Vickerman, P. B. (2016). Paralympic Legacy: Exploring the Impact of the Games on the Perceptions of Young People With Disabilities. *Adapted physical activity quarterly : APAQ*, *33*(4), 338–357. https://doi.org/10.1123/APAQ.2014-0237.

da Silva Musa, V., dos Santos, W. R., Menezes, R. P., Costa, V., Aquino, R., & Menezes, R. P.(2021). COVID-19 and Brazilian handball coaches: Impacts on training prescription and professional learning. *Motriz. Revista de Educacao Fisica*, *26*(4). https://doi.org/10.1590/S1980-65742020000400127

Davis, L., Jowett, S., & Tafvelin, S. (2019). Communication Strategies: The Fuel for Quality Coach-Athlete Relationships and Athlete Satisfaction. *Frontiers in Psychology*, *10*. https://doi.org/10.3389/fpsyg.2019.02156.

de Cruz, N. P., Spray, C. M., & Smith, B. (2019). Implicit beliefs of disability and elite sport: the para- athlete experience*. *Qualitative Research in Sport, Exercise and Health*, *11*(1), 69-91. https://doi.org/10.1080/2159676X.2017.1384753

Dehghansai, N., Pinder, R. A., Baker, J., & Renshaw, I. (2021). Challenges and stresses experienced by athletes and coaches leading up to the Paralympic Games. *PloS one*, *16*(5), e0251171. https://doi.org/10.1371/journal.pone.0251171.

de Souza, D. L., & Brittain, I. (2022). The Rio 2016 Paralympic Games: The Visibility of People WithDisabilities in Brazil as a Possible Legacy. *Communication and Sport*, *10*(2), 334-353. https://doi.org/10.1177/2167479520942739

De Souza, D. L., Marques, A. M., & Fermino, A. L. (2020). Paralympic games: The experience with "the other" through the screens. *Journal of Physical Education (Maringa)*, *31*(1). https://doi.org/10.4025/JPHYSEDUC.V31I1.3170

Dehghansai, N., Pinder, R. A., Baker, J., & Renshaw, I. (2021). Challenges and stresses experienced by athletes and coaches leading up to the Paralympic Games. *PLoS ONE*, *16*(May 5). https://doi.org/10.1371/journal.pone.0251171

Dupuy, A., Goosey-Tolfrey, V. L., Webborn, N., Rance, M., & Ratel, S. (2024). Overhead and Wheelchair Sport-related injuries in Para Athletes: Interplay between disability and sport specific factors. *American journal of physical medicine & rehabilitation*, 10.1097/PHM.0000000000002547. Advance online publication. https://doi.org/10.1097/PHM.0000000000002547.

Duvall, J., Satpute, S., Cooper, R., & Cooper, R. A. (2021). A review of adaptive sport opportunities for power wheelchair users. *Disability and Rehabilitation. Assistive Technology*, *16*(4), 407. https://doi.org/10.1080/17483107.2020.1767220.

Fagher, K., Baumgart, J. K., Solli, G. S., Holmberg, H. C., & Lexell, J. (2022). Preparing for snow- sport events at the Paralympic Games in Beijing in 2022: recommendations and remaining questions. *BMJ Open Sport and Exercise Medicine*, *8*(1). https://doi.org/10.1136/bmjsem-2021- 001294

Fagher, K., Jacobsson, J., Dahlström, Ö., Timpka, T., & Lexell, J. (2017). An ehealth application of self-reported sports-related injuries and illnesses in paralympic sport: Pilot feasibility and usability study. *JMIR Human Factors*, *4*(4). https://doi.org/10.2196/humanfactors.8117

Fagher, K., Kunorozva, L., Badenhorst, M., Derman, W., Kissick, J., Verhagen, E., Ahmed, O. H., Jederström, M., Heron, N., Khoshnood, A. M., Silva, A., Kenttä, G., & Lexell, J. (2022). Safe and Healthy Para sport project (SHAPE): A study protocol of a complex intervention within Para sport. *BMJ Open Sport and Exercise Medicine*, *8*(3). https://doi.org/10.1136/bmjsem-2022- 001392

Ferrara, K., Burns, J., & Mills, H. (2015). Public attitudes toward people with intellectual disabilities after viewing Olympic or Paralympic performance. *Adapted physical activity quarterly : APAQ*, *32*(1), 19–33. https://doi.org/10.1123/apaq.2014-0136.

Fitri, M., Abidin, N. E. Z., Novan, N. A., Kumalasari, I., Haris, F., Mulyana, B., Khoo, S., & Yaacob, N. (2022). Accessibility of Inclusive Sports Facilities for Training and Competition in Indonesia and Malaysia. *Sustainability (Switzerland)*, *14*(21). https://doi.org/10.3390/su142114083

Gebreslassie, M., Sampaio, F., Nystrand, C., Ssegonja, R., & Feldman, I. (2020). Economic evaluations of public health interventions for physical activity and healthy diet: A systematic review. *Preventive Medicine*, *136* (December 2019),106100 https://doi.org/10.1016/j.ypmed.2020.106100

Guan, Z., & Hong, F. (2016). The development of elite disability sport in China: A critical review. *International*

*Journal of the History of Sport*, *33*(5), 485-510. https://doi.org/10.1080/09523367.2016.1167685

Gurgis, J. J., Kerr, G., & Darnell, S. (2022). 'Safe Sport Is Not for Everyone': Equity-Deserving Athletes' Perspectives of, Experiences and Recommendations for Safe Sport. *Frontiers in psychology*, *13*, 832560. https://doi.org/10.3389/fpsyg.2022.832560.

Haiachi, M. C., Cardoso, V. D., Kumakura, R. S., Mello, J. B., Filho, A. R. R., & Gaya, A. C. A. (2018). Different views of (dis)ability: Sport and its impact on the lives of women athletes with disabilities. *Journal of Physical Education and Sport*, *18*(1), 55-61. https://doi.org/10.7752/jpes.2018.01007

Hassett, L., Moseley, A. M., McKay, M. J., Cole, J., Chagpar, S., Geerts, M. P. J., Kwok, W. S., Jensen, C., Sherrington, C., & Shields, N. (2024). The Effects of Sport Participation for Adults With Physical or Intellectual Disability: A Scoping Review. *Journal of physical activity & health*, 1–12. Advance online publication. https://doi.org/10.1123/jpah.2024-0107.

Hasnah, F. (2016). Meta-analysis of risk factors for stroke in Asia. *Applied Microbiology and Biotechnology*, *85*(1), 2071-2079.

International Paralympic Committee. (2018). *Paralympic Sports - List of Para Sports and Events | International Paralympic Committee*. International Paralympic Committee. https://www.paralympic.org/sports.

Jaeken, D. (2020). Classification in the Paralympics: The relationship between impairment and participation. *Developmental Medicine & Child Neurology*, *62*(7), 769. https://doi.org/10.1111/dmcn.14537.

Koyongian, Y., Rawis, J. A. M., Wullur, M. M., & Rotty, V. N. J. (2021a). Implementation of Instructional Supervision: Approaches and Challenges for Teacher Professionalism Development. *Journal of Education Management Bahana*, *10*(2), 48. https://doi.org/10.24036/jbmp.v10i2.115405

Koyongian, Y., Rawis, J. A. M., Wullur, M. M., & Rotty, V. N. J. (2021b). Implementation of Instructional Supervision: Approaches and Challenges for Teacher Professionalism Development. *Journal of Education Management Bahana*, *10*(2), 48. https://doi.org/10.24036/jbmp.v10i2.115405

Martin Ginis, K. A., van der Ploeg, H. P., Foster, C., Lai, B., McBride, C. B., Ng, K., Pratt, M., Shirazipour, C. H., Smith, B., Vásquez, P. M., & Heath, G. W. (2021). Participation of people living with disabilities in physical activity: a global perspective. *Lancet (London, England)*, *398*(10298), 443–455. https://doi.org/10.1016/S0140-6736(21)01164-8.

Martin, J. J., & Whalen, L. (2014). Effective Practices of Coaching Disability Sport. *European Journal of Adapted Physical Activity*, *7*(2), 13-23. https://doi.org/10.5507/euj.2014.007

McMaster, S., Culver, D., & Werthner, P. (2012). Coaches of athletes with a physical disability: A look at their learning experiences. *Qualitative Research in Sport, Exercise and Health*, *4*(2), 226- 243. https://doi.org/10.1080/2159676X.2012.686060

McNamee M. J. (2017). Paralympism, Paralympic values and disability sport: a conceptual and ethical critique. *Disability and rehabilitation*, *39*(2), 201–209. https://doi.org/10.3109/09638288.2015.1095247.

Misener, L., Darcy, S., Legg, D., & Gilbert, K. (2013). Beyond olympic legacy: Understanding paralympic legacy through a thematic analysis. *Journal of Sport Management*, *27*(4), 329-341. https://doi.org/10.1123/jsm.27.4.329

Moura, A. K. S., Bataglion, G. A., Nicoletti, L. P., & Cardoso, V. D. (2021). Parent's perception of children's participation in School Paralympics Games in the state of Roraima/Brazil. *Journal of Human Sport and Exercise*, *16*(Proc1), 23-33. https://doi.org/10.14198/jhse.2021.16.Proc1.03

Oggero, G., Puli, L., Smith, E. M., & Khasnabis, C. (2020). Participation and Achievement in the Summer Paralympic Games: The Influence of Income, Sex, and Assistive Technology. *Sustainability*, *13*(21), 11758. https://doi.org/10.3390/su132111758.

Olsen, S. H., Saperstein, S. L., & Gold, R. S. (2019). Content and feature preferences for a physical activity app for adults with physical disabilities: Focus group findings. *JMIR MHealth and UHealth*, *7*(10). https://doi.org/10.2196/15019

Pack, S., Kelly, S., & Arvinen-Barrow, M. (2017). "I think I became a swimmer rather than just someone with a disability swimming up and down:" paralympic athletes perceptions of self and identity development. *Disability and Rehabilitation*, *39*(20), 2063-2070. https://doi.org/10.1080/09638288.2016.1217074

Pinheiro, L. S. P., Ocarino, J. M., Madaleno, F. O., Verhagen, E., De Mello, M. T., Albuquerque, M. R., Andrade, A. G. P., Da Mata, C. P., Pinto, R. Z., Silva, A., & Resende, R. A. (2021). Prevalence and incidence of injuries in para athletes: A systematic review with meta-analysis and GRADE recommendations. *British Journal of Sports Medicine*, *55*(23), 1357-1365. https://doi.org/10.1136/bjsports-2020-102823

Raharjo, S., Yunus, M., Pelana, R., & Azidin, R. M. F. R. (2023). The benefit of a four-week range of motion exercise on hand muscle strength in children with Down Syndrome. *Pedagogy of Physical Culture and Sports, 27*(6), 481–486. https://doi.org/10.15561/26649837.2023.0606.

Ramsden, R., Hayman, R., Potrac, P., & Hettinga, F. J. (2023). Sport Participation for People with Disabilities: Exploring the Potential of Reverse Integration and Inclusion through Wheelchair Basketball. *International Journal of Environmental Research and Public Health*, *20*(3). https://doi.org/10.3390/ijerph20032491.

Retnawati, H., Apino, E., Kartianom, Djidu, H., & Anazifa, R. D. (2018). Introduction to Meta-analysis. *Introduction to Meta-analysis*, 1-208.

Saint-Martin, S. V., Turner, M. J., & Ruiz, M. C. (2020). Mental preparation of olympic and paralympic swimmers: Performance-related cognitions and emotions, and the techniques used to manage them. *Journal of Physical Education and Sport*, *20*(6), 3569-3578. https://doi.org/10.7752/jpes.2020.06481

Shirazipour, C. H., Stone, R. C., Lithopoulos, A., Capaldi, J. M., & Latimer-Cheung, A. E. (2023). Examining the Impact of the Rio 2016 Paralympic Games on Explicit Perceptions of Paralympians and Individuals with Disabilities. *Health communication*, *38*(8), 1501–1507. https://doi.org/10.1080/10410236.2021.2017107.

Shuhan, S., Rui, Y., Ailin, M., Liu, C., & Tang, J. (2011). China and the development of sport for persons with a disability, 1978-2008: a review. *Sport in Society*, *14*(9), 1192-1210. https://doi.org/10.1080/17430437.2011.614776

Siswanto. (2010a). Systematic Review as a Research Method to Synthesize Research Results (An Introduction). *Bulletin of Health Systems Research*, *13*(4), 326-333.

Siswanto. (2010b). Systematic Review as a Research Method to Synthesize Research Results (An Introduction). *Bulletin of Health Systems Research*, *13*(4), 326-333.

Souza, D. L., & Brittain, I. (2022). The Rio 2016 Paralympic Games: inspiration as a possible legacy for disabled Brazilians. *European Journal for Sport and Society*, *19*(1), 78-93. https://doi.org/10.1080/16138171.2021.1879363

Subagio, I., Manik, N., Perdana, R.P., Sastaman B, P., Yantiningsih, E., Azidin, R.M.F.R., & Raharjo, S. (2024). Improved hand muscle ability after 6 weeks of squeezing a tennis ball exercise in children with spastic cerebral palsy. *Fizjoterapia Polska, 24*(1), 73-77. https://doi.org/10.56984/8ZG2EF8753.

Szabo, S.W., & Kennedy, M. D. (2022). Practitioner perspectives of athlete recovery in paralympic sport. *International Journal of Sports Science and Coaching*, *17*(2), 274-284. https://doi.org/10.1177/17479541211022706

Townsend, R. C., Smith, B., & Cushion, C. J. (2015). Disability sports coaching: towards a critical understa *Sports Coaching Review*, *4*(2),80–98. https://doi.org/10.1080/21640629.2016.1157324

Wang, C., Stovitz, S. D., Kaufman, J. S., Steele, R. J., & Shrier, I. (2024). Principles of musculoskeletal sport injuries for epidemiologists: a review. *Injury epidemiology*, *11*(1), 21. https://doi.org/10.1186/s40621-024-00507-3.

Yudhistira, D., Suherman, W. S., Wiratama, A., Wijaya, U. K., Paryadi, P., Faruk, M., Hadi, H., Siregar, S., Jufrianis, J., & Pratama, K. W. (2021). Content Validity of the HIIT Training Program in Special Preparations to Improve the Dominant Biomotor Components of Kumite Athletes. *International Journal of Human Movement and Sports Sciences*, *9*(5), 1051-1057. https://doi.org/10.13189/saj.2021.090527

Yudhistira, D., & Tomoliyus. (2020). Content validity of agility test in karate kumite category.*International Journal of Human Movement and Sports Sciences*, *8*(5), 211-216. https://doi.org/10.13189/saj.2020.080508

Yulianto, W. D., & Yudhistira, D. (2021). *Content Validity of Circuit Training Program and ItsEffects on The Aerobic Endurance ofWheelchair Tennis Athletes*. *9*(c), 60-65.

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