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### EXPLORING ATHLETE CARE: AN IN-DEPTH ANALYSIS OF INJURY MANAGEMENT FOR DISABLED ATHLETES IN NORTH SUMATERA

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#### Abstract

As the landscape of sports continues to embrace diversity and inclusivity, the well-being of disabled athletes has gained prominence on the global stage. This study presents a comprehensive study aimed at shedding light on the intricate domain of injury management among disabled athletes in North Sumatera. Through a mixed-methods approach, this research offers a multifaceted exploration of the challenges and strategies inherent to athlete care in the context of disabilities. A diverse sample of disabled athletes representing various sports disciplines and regions across North Sumatera participated in this study. Quantitative data were collected through structured online surveys, capturing demographic information, injury history, training routines, and access to medical support. Complementing the quantitative phase, qualitative insights were derived from in-depth semi-structured interviews with selected athletes and focus group discussions involving coaches, sports medicine professionals, and sports organization representatives. The quantitative analysis revealed insights into the prevalence of injuries among disabled athletes, disparities in medical support, and the impact of training routines on injury rates. Qualitative findings illuminated athletes' experiences with injury prevention, treatment, rehabilitation, and the psychological effects of injuries. Coaches and sports medicine professionals provided perspectives on existing athlete care practices and identified areas for improvement. This study contributes a nuanced understanding of injury management within the realm of disabled sports in North Sumatera. As North Sumatera and the broader sporting community strive for inclusivity and excellence, this study serves as a valuable resource to guide the evolution of athlete care practices for disabled athletes.

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## INTRODUCTION

In the realm of sports, athletes with disabilities have proven their remarkable abilities, showcasing their talents on both national and international stages (McKay et al., 2022; McNamee et al., 2021). As the world of sports becomes increasingly inclusive, it is paramount to address the unique challenges and considerations surrounding injury management for disabled athletes (Hosokawa et al., 2022). In the province of North Sumatra, Indonesia, these considerations take on a specific regional context that warrants a comprehensive examination.

Surveillance of injuries and illnesses has evolved into a standard practice, especially prevalent at major sporting events such as the Olympic and Paralympic Games on the global stage, as well as the National Paralympics within the context of national competitions (Bentzen et al., 2022; Yanagisawa et al., 2018). The primary objective of this rigorous monitoring is to safeguard and prioritize the well-being and physical integrity of the participating athletes. At an international level, the scrutiny of injuries and illnesses has gained paramount importance due to the high stakes and global attention surrounding events like the Olympics (Tuakli-Wosornu et al., 2023). Similarly, at a national level, notably in events like the National Paralympics, comprehensive surveillance measures have been integrated into the operational framework to ensure the health and safety of athletes representing their countries. This systematic approach involves the collection, analysis, and interpretation of injury and illness data, enabling event organizers and healthcare professionals to respond swiftly to emerging health concerns, ultimately fostering an environment of care and protection for the athletes (Jeschke et al., 2020).

In the region of North Sumatra, athletes with disabilities have demonstrated their remarkable capabilities by achieving significant accomplishments on the national stage. These dedicated individuals, despite facing various

challenges, have showcased exceptional talents and determination that have propelled them to excel in various sporting endeavors (Nabilla et al., 2021). Their achievements stand as a testament to their unwavering commitment and the robust support systems that have been established to nurture their talents. These athletes have shattered stereotypes and preconceived notions, proving that disabilities are not barriers to success in the world of sports. Their accomplishments serve as an inspiration to both the disabled and able-bodied populations, fostering a spirit of inclusivity and determination within the community. These triumphs have also drawn attention to the importance of providing adequate training facilities, coaching, and resources for disabled athletes, further emphasizing the need for continued investment in adaptive sports programs. As their successes continue to resonate, these athletes contribute to raising awareness about the potential that exists within every individual, regardless of their physical challenges, and underline the significance of creating an environment that enables everyone to thrive.

This study embarks on a journey to dissect the landscape of injury management within this distinctive subset of athletes. North Sumatra, known for its rich cultural heritage and diverse population, has witnessed a surge in disabled athletes participating in various sports. However, a thorough investigation into how injuries are handled within this specific demographic remains a crucial undertaking (Provincial Government of North Sumatra, 2020).

The primary objective of this study is to unravel the multifaceted dimensions of injury management for disabled athletes in North Sumatra. By delving into the prevailing practices, healthcare systems, athlete experiences, and cultural nuances, this research aims to shed light on the challenges and opportunities present within the region. The insights derived from this study could contribute to the development of targeted strategies that

enhance injury prevention, management, and overall athlete well-being.

Employing a mixed-methods approach, this article aims to bridge the current gap in knowledge by providing a comprehensive analysis of the injury management landscape in North Sumatra. By examining the prevalence of injuries, the accessibility of medical support, rehabilitation techniques, and the psychological impacts of injuries, this study seeks to foster a deeper understanding of the specific needs and considerations of disabled athletes within the region.

Furthermore, this research holds the potential to inform policy decisions, drive advancements in athlete care, and foster collaborative efforts among stakeholders, practitioners, and researchers. By recognizing and addressing the unique challenges faced by disabled athletes in North Sumatra, we can work towards creating a more inclusive, supportive, and effective framework for injury management. Ultimately, this article aspires to contribute to the broader discourse on athlete care and propel the evolution of sports to greater heights of inclusivity and excellence.

## **MATERIAS AND METHODS**

### **Quantitative Phase**

**Survey Questionnaires:** A structured survey questionnaire was developed to gather quantitative data on athletes' demographic information, injury history, training routines, and access to medical support. The survey was administered online, ensuring accessibility for participants across the country.

### **Qualitative Phase**

**Semi-Structured Interviews:** In-depth semi-structured interviews were conducted with a subset of participants to gain deeper insights into their experiences, challenges, and perceptions related to injury management. The interviews were designed to elicit narratives regarding injury prevention, treatment, rehabilitation, and psychological impacts.

**Focus Group Discussions:** Focus group discussions were organized with coaches, sports medicine professionals, and representatives from sports organizations. These discussions aimed to provide a multifaceted view of the existing athlete care ecosystem in Indonesia, uncovering strengths and areas for improvement.

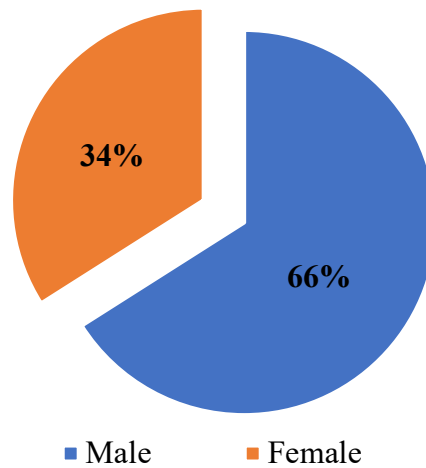
### **Data Analysis**

Descriptive statistics were employed to analyze demographic data, injury prevalence, and access to medical support. Thematic analysis was employed to identify recurring themes within the transcribed interview and focus group data. The qualitative data were coded, categorized, and synthesized to develop meaningful insights into injury management practices and experiences. Ethical approval was obtained from National Paralympic Committee (NPC) prior to conducting the study. Informed consent was obtained from all participants, ensuring their willingness to participate and the assurance of data confidentiality.

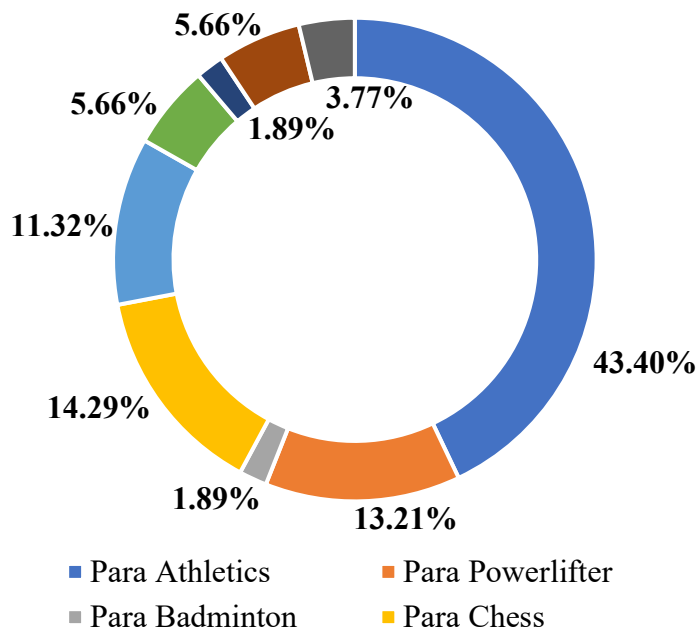
## **RESULTS AND DISCUSSION**

The current number of athletes with disabilities in North Sumatra who are members of the Regional Training of the North Sumatra Program Towards the XVII Aceh-Sumatera National Paralympic Week (PEPARNAS) 2024 is 53 people. This training is coordinated by the North Sumatra National Paralympic Committee (NPC). The number of male participants was 35 and 18 female participants, the percentage of sex is shown in Figure 1. Based on these data, the number of athletes with disabilities in North Sumatra province is dominated by men.

These disabled athletes come from 8 regencies or cities in North Sumatra, namely Asahan, Binjai, Dairi, Deli Serdang, Langkat, Medan, Serdang Bedagai, Tanjung Balai, and Tebing Tinggi. These 8 regencies/cities are still relatively few where it is known that the number of regencies/cities in North Sumatra is 33. Sports, regional origin, gender of each athlete is explained in Table 1. Athletes with disabilities



**Figure 1.** The percentage of the sex of athletes in the North Sumatra Regional Training Program Towards the XVII Aceh-Sumatera National Paralympic Week (PEPARNAS) 2024.



**Figure 2.** Percentage of types of sports athletes with disabilities in Regional Training Program North Sumatra Towards National Paralympic Week (PEPARNAS) XVII Aceh-Sumatera 2024.

consist of 23 people as Para Athletics, 7 people as Para Powerlifter, 1 person as Para Badminton, 7 people as Para Chess, 6 people as Blind Judo, 3 people as Para Archery, 1 person as Para Swimming, 3 people as Para Table Tennis, and 2 people as Wheelchair Tennis, where the percentage of types of athletes with disabilities is presented in Figure 2.

Potential athlete injury refers to the risk of physical harm or damage that athletes may face during sports or training activities. These injuries can range from minor strains and sprains to more severe conditions such as fractures or concussions. Factors contributing to potential athlete injuries include the intensity and duration of training, inadequate warm-up routines, improper technique, fatigue, and insufficient rest

between sessions. In contact sports, collisions with opponents amplify the risk of injury. Mitigating potential athlete injuries requires comprehensive measures like proper coaching, tailored fitness regimens, protective gear utilization, and fostering a culture of injury awareness to ensure athletes' safety and overall well-being. **The observation results show that the injury data for athletes with disabilities in**

Table 1. Data of athletes with disabilities in Regional Training North Sumatra Program Towards National Paralympic Week (PEPARNAS) XVII Aceh-Sumatera Utara.

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Names of athletes	Gender	Sports Type	District/City
DA01	Male	Para Athletics	Binjai
DA02	Female	Para Athletics	Tanjung Balai
DA03	Male	Para Athletics	Medan
DA04	Male	Para Athletics	Deli Serdang
DA05	Female	Para Athletics	Medan
DA06	Male	Para Athletics	Serdang Bedagai
DA07	Male	Para Athletics	Serdang Bedagai
DA08	Male	Para Athletics	Medan
DA09	Male	Para Athletics	Dairi
DA010	Female	Para Athletics	Medan
DA011	Male	Para Athletics	Deli Serdang
DA012	Female	Para Athletics	Deli Serdang
DA013	Female	Para Athletics	Deli Serdang
DA014	Male	Para Athletics	Deli Serdang
DA015	Female	Para Athletics	Binjai
DA016	Female	Para Athletics	Binjai
DA017	Male	Para Athletics	Medan
DA018	Male	Para Athletics	Medan
DA019	Male	Para Athletics	Medan
DA020	Female	Para Athletics	Medan
DA021	Male	Para Athletics	Medan
DA022	Male	Para Athletics	Medan
DA023	Male	Para Athletics	Medan
DA024	Male	Para Powerlifter	Medan
DA025	Female	Para Powerlifter	Deli Serdang
DA026	Male	Para Powerlifter	Deli Serdang
DA027	Male	Para Powerlifter	Deli Serdang
DA028	Male	Para Powerlifter	Serdang Bedagai
DA029	Female	Para Powerlifter	Deli Serdang
DA030	Male	Para Powerlifter	Deli Serdang
DA031	Male	Para Badminton	Tebing Tinggi
DA032	Female	Para Chess	Deli Serdang
DA033	Female	Para Chess	Deli Serdang
DA034	Female	Para Chess	Medan
DA035	Female	Para Chess	Medan
DA036	Female	Para Chess	Medan
DA037	Male	Para Chess	Medan
DA038	Female	Para Chess	Medan
DA039	Female	Blind Judo	Deli Serdang
DA040	Male	Blind Judo	Medan
DA041	Male	Blind Judo	Medan
DA042	Male	Blind Judo	Medan
DA043	Male	Blind Judo	Medan
DA044	Male	Blind Judo	Medan
DA045	Male	Para Archery	Serdang Bedagai
DA046	Male	Para Archery	Tebing Tinggi
DA047	Male	Para Archery	Langkat
DA048	Male	Para Swimming	Asahan
DA049	Male	Para Table Tennis	Deli Serdang
DA050	Female	Para Table Tennis	Deli Serdang
DA051	Male	Para Table Tennis	Medan

North Sumatra is explained in Table 2.

Table 2. Observation results of the injury data for athletes with disabilities in North Sumatra.

Sports Type	Injury Details
Para Athletics	A total of 23 athletes were reported injured. A total of 8 people had minor injuries, numbness, sore muscles, dislocated ankles, and numbness and soreness in the legs. Athletics sports 5 ankle injuries, 3 people arm injuries, and 3 people minor injuries.
Para Powerlifter	In the weight lifting competition, 3 people were injured in the shoulder.
Para Badminton	In this sport, the most common injuries experienced by badminton athletes are injuries to the elbows, ankles and thighs.
Para Chess	In sports chess it is very rare to get injured.
Blind Judo	A total of 2 people injured shoulder.
Para Archery	The injury occurred to the arm.
Para Swimming	Swimming athletes often experience injuries to the shoulders, neck and knees.
Para Table Tennis	Injuries that are often experienced in the shoulder and ankle.
Wheelchair Tennis	Common injuries to the shoulder.

The impact of injury on athletes with disabilities is a multifaceted challenge that extends beyond physical setbacks. Injured disabled athletes often experience a complex interplay of physical limitations, psychological strain, and social isolation. The immediate consequence of injuries, such as strains or fractures, can disrupt their training routines and participation in sports, potentially affecting their performance and career trajectories. Beyond the physical aspect, injuries can amplify feelings of frustration, helplessness, and anxiety, as athletes grapple with the uncertainty of their recovery and the fear of regression. These psychological struggles are compounded by the social dimension, as disabled athletes may already face societal misconceptions and biases about their capabilities. The need for adaptive equipment, specialized rehabilitation, and tailored training regimens can further strain their access to resources.

However, the resilience of disabled athletes often shines through in their determination to overcome adversity, adapt their strategies, and seek out support networks. By addressing not only the physical but also the emotional and social repercussions of injuries, athlete care can play a pivotal role in ensuring their overall well-being, fostering a holistic approach to rehabilitation and helping them continue to thrive in the world of sports (Ardern et al., 2022; Bennett, 2022; Eindhoven et al., 2022).

The impact of injuries on disabled athletes in North Sumatra is a multifaceted phenomenon that reverberates across various dimensions of their sports engagement and overall well-being. Injuries can significantly disrupt the performance trajectories of disabled athletes, impeding their training consistency, competitive participation, and skill development. Physical limitations arising from injuries may necessitate modifications to training routines and techniques, potentially hindering athletes' ability to reach their peak performance levels. This disruption can lead to a cycle of frustration, as

athletes are compelled to recalibrate their goals and adapt to the limitations posed by injuries. Furthermore, the psychological toll of injuries on disabled athletes' self-confidence, motivation, and mental resilience can be profound, influencing their mental readiness to compete at their best. In the context of North Sumatra, where resources and facilities may already be limited, injuries further compound the challenges disabled athletes face in accessing specialized care and rehabilitation. The broader impact on the disabled sports community cannot be ignored, as athletes often serve as inspirational figures for others facing similar challenges (Siegfried, 2023; Williams et al., 2022). Addressing the impact of injuries requires a holistic approach that encompasses both physical rehabilitation and comprehensive psychological support, along with continued efforts to promote inclusive environments and improve accessibility to necessary resources for disabled athletes to regain and sustain their performance levels.

The psychosocial impact of injuries on athletes with disabilities is a profound and intricate phenomenon that encompasses a range of emotional, cognitive, and social dimensions. When disabled athletes sustain injuries, they often face a cascade of psychological challenges, including feelings of frustration, helplessness, and anxiety due to disruptions in their training routines and performance goals. The psychological toll can extend to a diminished sense of self-esteem and self-worth, as athletes grapple with the temporary or permanent alterations in their abilities. Moreover, the isolation and sense of detachment stemming from being sidelined can contribute to feelings of loneliness and depression. The complex interplay between physical and psychological aspects often underscores the importance of a comprehensive approach to athlete care, one that not only addresses the physical rehabilitation needs but also integrates mental health support into the recovery process (Kim & Park, 2020; Palermi et al., 2021). In the context of athletes

with disabilities in North Sumatra, where awareness and accessibility to mental health services may be limited, these psychosocial challenges can be particularly pronounced. Recognizing the profound impact of injuries on disabled athletes necessitates not only tailored rehabilitation programs but also initiatives to promote open dialogue, destigmatize mental health discussions, and foster a support network that champions the holistic well-being of athletes beyond their physical prowess.

The current conditions for treating athletes with disabilities in North Sumatra remain far from optimal, reflecting a range of persistent challenges that hinder effective care. Limited accessibility to specialized equipment, facilities, and trained professionals poses a significant barrier to comprehensive treatment. Financial constraints further exacerbate the situation, making it difficult for athletes to access essential rehabilitation services and adaptive technologies. The awareness and understanding of the unique needs of disabled athletes among both medical professionals and the general public remain insufficient, resulting in subpar care and limited support systems. The lack of integrated approaches, encompassing physical, psychological, and social aspects of care, contributes to incomplete rehabilitation and underestimates the holistic requirements of athletes. A dearth of tailored training programs, which should address the intricacies of various disabilities, compounds the challenges faced by athletes striving for peak performance (Bradley & Reardon, 2022). To truly uplift the conditions for treating athletes with disabilities in North Sumatra, concerted efforts are imperative, demanding investment in resources, infrastructure, education, and advocacy to create an inclusive and enabling environment that empowers disabled athletes to excel and thrive.

The approach to managing injuries among athletes with disabilities in North Sumatra has predominantly relied on the utilization of private health insurance funds, marking a distinct absence of direct intervention or assistance from

the National Paralympic Committee (NPC) of North Sumatra. This particular method of handling injuries highlights a notable gap in the system, as it places the onus on athletes to possess personal insurance coverage, potentially leaving them susceptible to inadequate or incomplete care due to the intricate nature of disabled athletes' injuries and rehabilitation needs. Furthermore, this mode of management overlooks the proactive role that the NPC could play in offering specialized support and tailored resources to athletes during their recovery journey. The lack of direct involvement from the NPC deprives disabled athletes of an established platform for accessing comprehensive care, guidance, and resources dedicated to addressing the complexities of their impairments and the unique demands of their sports-related injuries. This scenario underscores the pressing need for a more cohesive, integrated strategy that amalgamates the efforts of multiple stakeholders, including the government, sports organizations, healthcare providers, and insurance companies, to ensure that injured athletes with disabilities receive the comprehensive, targeted care and resources they require to effectively recuperate and resume their athletic pursuits with the fullest possible support. By embracing a more collaborative and comprehensive approach, North Sumatra can uplift the quality of care for disabled athletes, affirming their well-being and their right to access appropriate and encompassing treatment modalities, ultimately fostering a more equitable and supportive environment for athletes of all abilities.

Adaptation in training techniques for athletes with disabilities is a dynamic process that hinges on innovation and resourcefulness to mitigate injury risks while optimizing performance (Mileva & Zaidell, 2022). Disabled athletes encounter unique challenges due to their impairments, necessitating tailored approaches to training that align with their individual needs. These adaptations encompass a wide spectrum, from modifying exercise routines to

accommodate limited mobility or altered biomechanics to utilizing specialized equipment designed to enhance stability and safety (Allan et al., 2020). By tailoring training techniques, athletes can target their strengths while minimizing the strain on vulnerable areas, thus reducing the likelihood of injuries. These adaptations are not only preventative but also empowering, allowing athletes to push their boundaries while respecting their physical limitations (Silvers-Granelli et al., 2021). In North Sumatra, where access to state-of-the-art resources may be constrained, adaptive training techniques take on an even more crucial role in injury prevention. Collaborative efforts between coaches, medical professionals, and athletes themselves are central to identifying and implementing effective adaptations. The key lies in striking a balance between pushing athletes to achieve their best and ensuring their long-term well-being through strategies that cater to their specific disabilities, fostering a culture of resilience, adaptability, and injury-conscious training practices.

Establishing a collaborative treatment team for athletes with disabilities is an imperative initiative in North Sumatra, where comprehensive care is essential to address the multifaceted needs of disabled athletes. Such a team would encompass a diverse range of professionals, including medical experts, physiotherapists, coaches, sports psychologists, and adaptive equipment specialists. This interdisciplinary approach acknowledges that disabilities often present complex challenges that extend beyond physical aspects. By working together, these experts can tailor treatment plans that integrate medical rehabilitation with psychological support, adaptive training techniques, and the provision of specialized equipment. In a region where resources might be limited, a collaborative team approach can optimize the allocation of available resources and ensure that athletes receive well-rounded care (McIntosh et al., 2023; Smyth et al., 2022; Thompson et al., 2022). Furthermore, this model

can enhance communication and information-sharing, allowing for a more holistic understanding of athletes' conditions and progress. By fostering a culture of collaboration, the treatment team can continually adapt strategies based on the athletes' evolving needs, maximizing their potential, reducing injury risks, and promoting a supportive environment where athletes can thrive both in their sport and in their overall well-being.

The restricted access to special equipment in North Sumatra has resulted in a concerning lack of comprehensive treatment options for athletes with disabilities. This deficit significantly hampers the quality of care provided to disabled athletes, as specialized equipment is often essential for effective rehabilitation, training, and injury prevention. Without access to adaptive devices tailored to their specific needs, athletes face limitations in their training routines and the ability to address their impairments optimally (Mannella et al., 2023; Weiler et al., 2021). This can contribute to suboptimal recovery, hindered skill development, and an increased susceptibility to injuries. Moreover, the lack of access to specialized equipment further perpetuates the cycle of limited resources, as athletes might not be able to fully participate in their sports or compete at their highest levels due to the absence of necessary tools. In this context, efforts to improve accessibility to specialized equipment are crucial, including initiatives to provide financial support, promote awareness, and collaborate with manufacturers to design adaptive solutions suitable for the diverse range of disabilities among athletes. Only by addressing this equipment gap can North Sumatra begin to provide the holistic and tailored treatment necessary for disabled athletes to excel and maintain their well-being.

Embracing a holistic approach to injury management is imperative for enhancing the quality of care for athletes with disabilities in North Sumatra. Such an approach recognizes that injuries impact not only the physical well-

being of athletes but also their psychological and social dimensions. By integrating medical treatment, specialized rehabilitation, and psychological support, a holistic framework acknowledges the interconnectedness of these factors and aims to address them collectively (Whitaker et al., 2021). This approach requires collaboration among medical professionals, coaches, psychologists, and support personnel to provide tailored care that considers the athletes' unique impairments and challenges. In North Sumatra, where resources might be constrained, adopting a holistic approach optimizes the utilization of available resources to provide comprehensive care that focuses on recovery, psychological resilience, and reintegration into sports. Furthermore, this approach emphasizes injury prevention through adaptive training techniques, education on proper warm-up and cool-down routines, and the use of specialized equipment. By recognizing that athletes with disabilities require multifaceted support, a holistic approach not only improves their physical health but also empowers them to navigate the psychological and social dimensions of their injuries, fostering a sustainable path to success in sports and an enhanced overall quality of life (Patatas et al., 2022).

The implementation of an adjusted rehabilitation program is a pressing necessity for disabled students in North Sumatra. Such a program recognizes the diverse range of disabilities these students may have and tailors rehabilitation strategies to meet their individual needs. Whether it's physical therapy, speech therapy, or occupational therapy, an adjusted program ensures that each student's unique challenges are addressed effectively. This approach acknowledges that a one-size-fits-all model is inadequate, and it requires the involvement of specialized professionals who can design personalized rehabilitation plans. These plans should incorporate adaptive techniques, equipment, and exercises that align with the students' disabilities, fostering their



physical development and maximizing their potential for improvement. In a region where resources for disabled students might be limited, prioritizing adjusted rehabilitation programs can bridge the gap in care and support, enhancing the students' overall well-being and their ability to participate in educational and social activities (Hill et al., 2020). Furthermore, the program should encourage open communication and collaboration between educators, medical experts, therapists, and families to ensure a comprehensive and coordinated approach that empowers disabled students to thrive academically, socially, and emotionally.

The establishment of inclusive facilities and resources for athletes with disabilities in North Sumatra is vital to ensure the sustained quality of care and support. Inclusivity means creating an environment where athletes of all abilities can thrive, fostering accessibility, dignity, and equal opportunities. This entails not only physical accessibility through ramps, elevators, and modified facilities, but also the provision of adaptive sports equipment, such as wheelchair-accessible sports areas and specially designed training apparatuses. Additionally, specialized training areas and programs that cater to various disabilities contribute to athletes' safety and skill development. The availability of skilled coaches and medical experts who understand the intricacies of disabled athletes' needs is crucial for tailored training and effective injury prevention. Collaborations with disability organizations and advocacy groups can raise awareness, promote funding, and drive policy changes that ensure ongoing support for these facilities and resources (Cameron et al., 2019; Mosley, 2021; Plesons et al., 2019). By prioritizing inclusivity, North Sumatra can create a lasting impact on the quality of care provided to athletes with disabilities, enabling them to flourish in sports, lead healthier lives, and contribute to a more inclusive society.

The findings of this study emphasize the imperative for the establishment of inclusive sports facilities and resources that cater

comprehensively to the multifaceted requirements of athletes with disabilities. The outcomes of the study draw attention to the fundamental necessity of enhancing the accessibility of sports facilities, ensuring that they are designed and equipped to accommodate a wide spectrum of disabilities. These inclusive features encompass not only physical accessibility through ramps, elevators, and accessible pathways but also the availability of specialized training areas tailored to address the diverse range of impairments among athletes. Moreover, the study highlights the significance of incorporating adaptive equipment and gear that are specifically designed to cater to various disabilities, fostering a safe and conducive environment for athletes to train and compete. In North Sumatra, where resources might be limited, the study underscores the importance of prioritizing the allocation of resources to create these inclusive facilities, enabling athletes with disabilities to participate actively in sports while receiving the appropriate support. By addressing the accessibility and equipment gaps, North Sumatra can enhance the quality of care and opportunities available to athletes with disabilities, fostering a more equitable and inclusive environment that aligns with the principles of diversity and sports for all.

The concept of inclusive facilities and resources extends to the imperative of interdisciplinary collaboration among medical professionals, coaches, and support staff for the holistic care of athletes. The essence of this collaboration lies in recognizing that the well-being of athletes is a multifaceted endeavor that requires the combined expertise of various stakeholders. By fostering open channels of communication and coordinated efforts, this approach contributes to more effective injury prevention strategies, allowing for the identification and mitigation of potential risks before they escalate. Moreover, the collaborative engagement of medical professionals ensures that athletes receive timely and expert medical attention in the event of injuries, facilitating

swifter and more efficient recovery processes. In North Sumatra, where resources might be limited, this approach optimizes the utilization of available expertise to deliver comprehensive care. Furthermore, the study underscores that this collaboration extends to the provision of psychological and emotional support, which is integral to the overall well-being of athletes. By harmonizing the efforts of diverse professionals, North Sumatra can elevate the quality of athlete care, promoting enhanced injury prevention, accelerated recovery, and ultimately, superior athlete outcomes that reflect both physical prowess and comprehensive well-being.

The notion of inclusive facilities and resources extends to the crucial aspect of advocacy and awareness for athletes with disabilities, as underscored by the research findings. These findings shed light on the imperative of championing increased awareness and resources to address the unique challenges faced by athletes with disabilities. By amplifying awareness of the physical, psychological, and societal barriers these athletes encounter, North Sumatra can foster a greater understanding of their needs and struggles within the sports arena. This, in turn, can lead to improved allocation of resources, enhanced accessibility to facilities, and the development of targeted support systems. Furthermore, advocating for inclusiveness in sports on various platforms can cultivate an environment that not only appreciates the determination and resilience of disabled athletes but also proactively works toward their integration and empowerment (Guo & Zhu, 2023). Such advocacy endeavors can potentially lead to policy changes that prioritize inclusive sports facilities, training programs, and financial aid (Townsend et al., 2022). By raising the collective consciousness about the potential of athletes with disabilities, North Sumatra can spearhead a culture shift that not only refines injury management strategies but also elevates athlete welfare and contributes to a more inclusive and equitable sports landscape.

The theme of technological advances assumes significance in the context of discussions about improving injury management for disabled athletes in North Sumatra. These discussions should encompass the vast potential offered by cutting-edge technological innovations in the field of sports medicine. Wearable devices, for instance, can play a pivotal role in monitoring athletes' biomechanics, vital signs, and exertion levels, enabling more accurate injury prevention strategies by identifying early signs of strain or overexertion. Similarly, the integration of assistive technologies like exoskeletons and robotic devices can facilitate enhanced rehabilitation processes, aiding athletes with disabilities in regaining their strength, mobility, and functional independence. These technologies can be particularly transformative for disabled athletes, offering real-time feedback and personalized insights that align with their individual disabilities and rehabilitation needs. Given the diverse range of impairments among athletes, discussions should delve into how technological advancements can be tailored to suit their unique requirements, bridging the gap in resources and facilities in regions like North Sumatra. By harnessing the potential of wearable devices, assistive technologies, and other technological breakthroughs, North Sumatra can revolutionize its approach to injury prevention, diagnosis, and rehabilitation, elevating the quality of care provided to disabled athletes and ushering in a new era of progress and inclusivity in sports medicine.

The concept of long-term athlete development gains paramount significance when considering the implications of studies for the enduring career trajectories of athletes with disabilities in North Sumatra. Delving into these implications necessitates a comprehensive examination of strategies that extend beyond immediate injury management, encompassing the holistic arc of an athlete's career. This entails scrutinizing how disabled athletes can perpetuate their commitment and evolution

within their chosen sports, focusing on the nurturing of skills, physical prowess, and mental tenacity over time. Central to these discussions is the formulation of targeted training programs that dynamically adapt to the athlete's evolving abilities and requirements, fostering a continuum of growth. Additionally, the discourse should encompass robust strategies to enhance injury resilience, equipping athletes with the knowledge and tools to preempt injuries throughout their careers. In the context of North Sumatra, where resource constraints might prevail, these deliberations take on heightened importance, serving as a blueprint to ensure that disabled athletes are endowed with sustainable and structured avenues for prolonged development. By delving into these implications and synthesizing effective strategies, North Sumatra can forge an environment that empowers disabled athletes to continually evolve, learn, and thrive within their chosen disciplines, ultimately realizing their full athletic potential and nurturing gratifying athletic journeys.

Gaining a deeper understanding of injury management among athletes with disabilities in North Sumatra is imperative, as it holds the potential to bring about transformative insights with far-reaching implications. This understanding goes beyond the physical treatment of injuries, encompassing the psychological, emotional, and social dimensions that uniquely affect disabled athletes (Allan et al., 2020; Gurgis et al., 2023; Mueller et al., 2019). By unraveling these complexities, the study can illuminate the path toward enhanced athlete care, promoting tailored rehabilitation programs, specialized support systems, and inclusive facilities. This, in turn, paves the way for improved sports inclusion, fostering an environment where disabled athletes are provided equitable opportunities to excel. The impact of these insights is profound; they can empower athletes with disabilities to perform optimally not only at the regional but also at the national and international levels. By ensuring

that their physical well-being is supported holistically, athletes can overcome challenges, reach their fullest potential, and contribute to North Sumatra's representation on the global sporting stage, thereby echoing the principles of inclusivity and diversity in sports.

## CONCLUSION

In conclusion, the article underscores the growing recognition of the importance of disabled athletes' well-being within the evolving landscape of sports diversity and inclusivity. The achievements of athletes with disabilities on both national and international stages have elevated their prominence. The comprehensive surveillance of injuries and illnesses, especially in major events like the Olympic and Paralympic Games, demonstrates the dedication to safeguarding the physical integrity of participants. Focusing on North Sumatra, the study delves into injury management among disabled athletes, aiming to shed light on challenges and opportunities within the region. Employing a mixed-methods approach, the research bridges gaps in understanding by analyzing injury prevalence, medical accessibility, rehabilitation techniques, and psychological impacts. The article's ambition extends to informing policy decisions, improving athlete care, and fostering collaboration among stakeholders. The study highlights the need for enhanced athlete care, especially given the multifaceted challenges faced by disabled athletes, impacting both their physical performance and psychosocial well-being. The research outlines the limitations and challenges faced by disabled athletes in North Sumatra, including financial constraints and the lack of centralized support from the National Paralympic Committee. The integration of qualitative and quantitative data provides a comprehensive understanding of injury management, emphasizing the significance of adaptive training techniques and collaborative treatment teams. The shortage of specialized equipment and the importance of inclusive

facilities are highlighted as pivotal concerns. Advocacy, awareness, and innovative technological solutions are proposed to address these issues, with a call for interdisciplinary collaboration to enhance athlete care. The long-term development of athletes with disabilities is also emphasized, with strategies to enhance injury resilience and preemptive measures. The study's insights are expected to drive transformative change, empowering disabled athletes to excel not only at regional but also at national and international levels, while contributing to the broader discourse on inclusive and excellent sports participation.

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