Athletic Career Pathways in Para Sport: An Exploration of Para Track and Field

Abstract

Few studies have applied sport development models depicting Para athlete career development. This study utilises the Athletic Career Pathways in Paralympic Sports framework, developed to respond to the limitations of established sport development models when applied to Para sport. Employing a mixed methods design informed by critical realism, this study explores the career trajectories of Para track and field athletes whilst assessing the framework's broader applicability. The findings challenge the linear pathway of traditional models, and a revised framework is presented offering flexibility to respond to the Para sport-specific and cultural context. The importance of schooling type, accessibility to non-disabled sports, and the need for specialist equipment in Para track and field offer further original insights into a Para athlete's trajectory and validates the need for a Para sport-specific athlete career development model. These findings can be used to develop bespoke systems to support Para track and field athletes throughout their career trajectory.

Introduction

An athletic career pathway is characterised as a continuum that depicts an athlete's progress through developmental phases, processes, transitions, and level of performance in sport (from attraction to the sport to the elite phase) (Weissensteiner, 2017). This pathway is typically illustrated using sport development models, such as the Long-Term Athlete Development model (LTAD) (see Balyi et al., 2013), and the Talent Identification model (see Vaeyens et al., 2008). These models were developed from studies with non-disabled athletes, and empirical evidence to support their application in Para sport is still absent, despite earlier calls for this (Dehghansai et al., 2017a; Hutzler et al., 2016). Further, it is argued that these models do not reflect the multifaceted developmental pathways caused by disability-related nuances in Para

sport (Patatas, De Rycke, et al., 2021). For example, the models lack recognition that disability-related factors, such as when an athlete acquires an injury, may impact an athlete's pathway.

This paper aims to explore the athletic career pathway of Para athletes in a sport-specific context, focusing on Great Britain (GB) Para track and field athletes. In response to the criticisms of applying traditional sport development models in Para sport, the study draws on the Athletic Career Pathways in Paralympic Sports framework proposed by Patatas, De Bosscher, Derom and Winckler (2020) to guide the research. This framework was designed using a range of Para sports in Brazil and has yet to be applied in other cultural and sport-specific settings to assess its broader applicability, which this study aims to do. Using a critical realism lens, a mixed methods research design was employed to incorporate the perceived realities of individual athletes, their coaches and other stakeholders to understand the athlete's career pathways in Para track and field. Further, consideration was also given to the nature of the athlete's impairment, age, schooling, event classification, the charity support they received, and important individuals in the development phases impacting their athletic career pathway, offering a comprehensive understanding of the factors influencing athletes' career trajectories.

The findings challenge the linear pathway of existing models, including the Athletic Career Pathway in Paralympic Sports framework. A revised framework (see Figure 1) is presented that offers flexibility to respond to the Para sport-specific and cultural context. The findings confirm the importance of event discipline, classification, and impairment type, but additionally note the importance of schooling type, accessibility to non-disabled sports, and the need for specialist equipment in Para track and field. Thus, this study offers several points of new knowledge to this embryonic field of research. The findings will also help policymakers and practitioners working in Para sport to understand and develop bespoke systems that support track and field athletes throughout their career trajectory.

The paper adheres to the terminology recommended by the International Paralympic Committee (IPC, 2021). An exception to this is when our participants are directly cited, as critical realism assumes that culture is expressed in language and will shape both the way reality is experienced and interpreted (Braun & Clarke, 2022). For example, the authors recognise that the term 'able-bodied' in reference to a person who does not have a disability implies that all people with disabilities lack 'able bodies', or the ability to use their bodies well (IPC, 2021). However, those within the Para track and field community (athletes, coaches and staff) accept and frequently use this term. When participants are not being directly quoted, the term 'non-disabled' will be used.

This paper proceeds by first providing a concise review of relevant literature on athlete career development broadly and development studies specifically in the context of Para sport. It then explains the study's methodology. The findings of the research are presented, critically discussed, and summarised in relation to the existing literature, and a revised athletic career pathway framework is presented. The conclusion suggests several research recommendations, relevant to Para track and field athletes and other Para sport.

Literature Review

To date, academic literature has largely focused on the utilisation of sport development models to outline the different developmental phases and career journeys, from grassroots to elite levels, experienced by non-disabled athletes. Notable examples include the aforementioned LTAD model (Bayli & Hamilton, 2004) and the Talent Identification model (Vaeyens et al., 2008), alongside the Athletic Talent Development Environmental model (Henriksen et al., 2010), Holistic Athletic Career model (Wylleman & Lavallee, 2004), the Foundations, Talent, Elite, Mastery model (Gulbin et al., 2013), the Development Model of Sport Participation (Côté & Fraser-Thomas, 2007), the Athlete Recruitment, Retention, and Transition model (Green, 2005), and the Attraction, Retention/Transition and Nurturing model (Sotiriadou et al., 2008).

These models were all developed from non-disabled evidence and offer no consideration of Para sport-specific factors which may alter a Para athlete's career pathway. Indeed, except for the work of Patatas and colleagues (2020), the career pathway of Para athletes continues to be unexplored in academic literature. Therefore, the applicability of these models in Para sport remains unchallenged and evidence that suggests they need modifying is scarce.

This neglect could perhaps be attributed to earlier claims that the developmental phases of Para athlete pathways do not diverge from what is identified in the non-disabled athlete development models (e.g., Balyi et al., 2013; Gulbin et al., 2013; Sotiriadou et al., 2008). Yet, more recently, others have disagreed. For example, Patatas, De Bosscher, Derom & Winckler (2020) suggest that whilst the career pathway of Para sport athletes is linear like non-disabled athletes, unlike non-disabled athletes, it incorporates non-linear characteristics in which the athletes fluctuate in many entry and exit points. Further, Dehghansai et al. (2017a) argue that to create appropriate sport and impairment-specific athlete development models to enhance understanding of Para athlete career pathways, it is necessary to generate a foundational understanding of the Para sport-specific factors that may influence Para athletes' development. This study aims to do this by exploring the career pathways of Para athletes in the sport-specific context of GB Para track and field. Thus, the study contributes to a critical, yet embryonic, debate in this area.

The limited research available examining Para athlete development, spearheaded by academics such as Dehghansai and Patatas, has focused more on the disability-related nuances in Para sport generally, rather than athlete career pathways in a specific Para sport in a specific country, such as GB Para track and field. Yet, useful insights can be gained from this work on what affects the development phases and, therefore, the career pathways of Para athletes. Further, these studies suggest that the aforementioned models may not be suitable for Para sport, giving further impetus for this research. The nuances include the classification system, various types

of impairments (visual, intellectual, and physical), and whether the impairment is congenital or acquired, which affects sport participation, athlete development, and success in Para sport (Dehghansai & Baker, 2020; Dehghansai et al., 2017a, 2017b; Dehghansai, Lemez et al., 2020; Dehghansai, Spedale et al., 2020; Lemez et al., 2020; Patatas, De Bosscher, Derom & De Rycke, 2020; Patatas, De Bosscher, Derom & Winckler, 2020).

In Patatas, De Rycke, De Bosscher and Kons's (2021) study of Brazilian Para athletes, representing a range of Para sports, they found that athletes with an acquired impairment took 4.5 years to progress from the attraction to the elite phase. In comparison, athletes with congenital impairments took six years, started participating in Para sport eight years younger than athletes with acquired impairments, and achieved international sporting success (by winning medals) seven years earlier. Likewise, in their study of basketballers in Canada, Dehghansai, Spedale et al. (2020) found that athletes with an acquired impairment are reported to be on a fast-track career trajectory and reach the elite level (international senior level of competition) in half the time than athletes with congenital impairment (10 years) (Dehghansai, Spedale et al., 2020). Despite non-disabled athletes participating in basketball from a younger age than Para athletes and reaching initial milestones earlier in their careers (e.g., first international competition), by mid-career, the career trajectory of Para athletes with congenital impairments is similar to non-disabled basketball athletes (*ibid*). Beyond these studies, empirical comparative evidence is lacking to determine the broader cultural and environmental implications on the athletic career pathway of Para and non-disabled athletes.

Furthermore, the level of support a Para athlete needs influences their athlete development experience (Peake & Davies, 2022) and, therefore, their athletic career pathway. For example, an athlete with high support needs, who has attended specialist schooling, and follows an adapted national curriculum for sport is introduced to Para specific events earlier than those who do not attend specialist schools (e.g., athletes with acquired impairment). Accordingly,

the attraction (Para sport introduction) phase of their athletic career trajectory might be closer aligned to non-disabled athletes.

In summary, the existing literature suggests that there are disability-related nuances in Para sport which impact an athlete's development and thus, their athletic career pathway. Programmes designed to identify and support the development of athletes throughout their careers benefit from a basis of empirical evidence, yet this is absent in Para sport. To create evidence-based models of Para athlete development that encompass the complex career pathways of Para sport athletes, it is essential to first reflect upon the heterogeneity of Para sport athletes' characteristics, especially considering the disability-related nuances. Dehghansai, Spedale et al. (2020) suggest that the evaluation of disability-related nuances can assist in the management of athlete development, to avoid the generalization of all athletes into one athletic career pathway.

Analytical framework

This study answers calls for sport-specific research on Para athlete career pathways that challenge the applicability of traditional development models. To do this, this study critically examines the career trajectories of Para track and field GB athletes from the perspective of individual athletes, their coaches and other key stakeholders, offering holistic perspectives. Consideration of Para athlete impairment type, age, and event classification was important to offer a comprehensive investigation of the factors influencing the athletes' trajectories to elite level. In response to the criticisms levied at those applying traditional sport development models in Para sport, Patatas, De Bosscher, Derom and Winckler's (2020) recently developed Athletic Career Pathways in Paralympic Sports framework was selected to guide this research. This framework was chosen as it utilizes existing athlete development models to gain insights into various developmental phases for Para athletes while enabling the identification of

disability-specific characteristics that influence each phase. Further, this framework acknowledges significant variability in the development of Para athletes based on their sport, including the classification system and impairment type. Therefore, this framework enables us to further investigate the need for tailoring the developmental phases of Para athletes' career pathways. Due to the framework's infancy, it has not been applied beyond Patatas and colleagues' work. Therefore, this study also strives to assess its broader applicability in a new cultural and sport-specific context. The phases of the Athletic Career Pathways in Paralympic Sports framework are attraction, retention, competition, talent identification (ID) and development, elite, and retirement.

Methods

Para track and field is a diverse and multidisciplinary sport that accommodates athletes with a wide range of impairments. Classifications ensure fair competition by grouping athletes based on the type and severity of their impairments. Events are divided into "T" for track disciplines and "F" for field disciplines. For example, classifications range from T11, for athletes with severe visual impairments, to T44, which includes athletes with limb deficiencies. Events cover sprints, distance races, long jump, shot put, and combined events. As one of the original sports in the Paralympic programme, Para track and field has a long history of competition and a well-established pathway for elite athlete development in the UK.

Research Design

To comprehensively examine the career pathways of Para athletes, the study utilized a sequential mixed-methods research design. This approach was chosen to enable the triangulation of qualitative and quantitative data, ensuring a thorough analysis of athletes' developmental trajectories. A critical realist perspective underpinned the research, acknowledging that reality is complex and can only be partially accessed through a single

method and with athletes alone. This philosophy was instrumental in capturing diverse perspectives from athletes, coaches, and other stakeholders who play vital roles in shaping athletic career pathways. Critical realism emphasizes “access to situated, interpreted realities” rather than "decontextualised truths" (Braun & Clarke, 2022, p.284). This epistemological stance guided the study, encouraging the integration of individual narratives with broader quantitative patterns. By engaging key stakeholders, such as coaches and senior officials, the research gained deeper insight into the structural and individual factors influencing athlete development.

The study employed a structured, four-phase design to gather data systematically:

Phase 1: Semi-Structured Interviews

This qualitative phase explored athletes' individual developmental journeys and the experiences of their coaches. A total of 12 interviews were conducted, including seven athletes and five coaches, representing a variety of event classifications. Recruitment was facilitated by the UK Athletics Para Head Coach during a national training camp.

The interview protocol was informed by the existing literature and the framework guiding this study. Interviews ranged from 50 to 80 minutes, delving into themes such as athlete development, barriers to success, and pathways to elite competition. Importantly, participants were encouraged to discuss additional factors or experiences that had not been captured by prior research, allowing for the emergence of new themes. To protect confidentiality, details such as specific events, gender, and classifications were excluded from the final analysis. The athlete sample included individuals with diverse experiences, such as four world or Paralympic medalists, one athlete transitioning from another Para sport, and two identified through UK Sport Talent Programmes. Coaches represented track and field events, with both men and women included in the sample.

Table 1: Phase 1 Participants

Participant Number	**Event** **T = Track** **F = Field**	**World Para Athletics Classification Impairment Description (Paralympic.org)**
1	F12 Athlete	F11-13 (Vision impairment)
2	F44 Athlete	F42-44 (Lower limb competing without prosthesis affected by limb deficiency, leg length difference, impaired muscle power or impaired passive range of movement)
3	T34 Athlete	T32-34 (Co-ordination impairments (hypertonia, ataxia and athetosis))
4	F40 Athlete	F40-41 (Short stature)
5	T44 Athlete	T42-44 (Lower limb competing without prosthesis affected by limb deficiency, leg length difference, impaired muscle power or impaired passive range of movement)
6	T38 Athlete	T35-38 (Co-ordination impairments (hypertonia, ataxia and athetosis)
7	F55 Athlete	F51-57 (Limb deficiency, leg length difference, impaired muscle power or impaired range of movement)
8	Throws Coach	
9	Wheelchair Racing Coach	
10	Sprints Coach	
11	Jumps Coach & Parent	
12	Sprints & Middle-Distance Coach	

Phase 2 and 3: Quantitative Surveys

These phases provided a quantitative lens to examine the findings from Phase 1. Separate surveys were designed for athletes and coaches, capturing their perspectives on developmental milestones, access to resources, and competitive opportunities. The athlete survey included questions about impairment type, age at sport introduction, event specialization, and critical influences on their development (e.g., parents, coaches, or charities). The coach survey mirrored the themes explored in the athlete survey but adapted questions to reflect coaching perspectives. Insights from Phase 1 informed the survey design, ensuring that emergent themes such as the role of event-specific competition and the influence of external support systems were addressed.

Athletes eligible for the survey were those selected for the British Athletics Paralympic World Class Performance Programme (WCPP), which supports athletes with potential for medal

success. This group was divided into Podium and Podium Potential categories, based on their anticipated readiness for Paralympic competition within the next 8–12 years. The survey achieved an 81% response rate, with 42 athletes participating.

Coach respondents (n=38) included individuals who had coached WCPP athletes within the past four years. This ensured that perspectives on athlete development and selection criteria were current and relevant. Together, these surveys allowed for a robust quantitative analysis of the factors shaping Para athletes' career pathways.

Phase 4: Key Stakeholder Interviews

To contextualize and validate the findings from earlier phases, three interviews were conducted with senior staff from UK Athletics. This included the Head Coach for the British Athletics Paralympic Programme and two Parallel Success Coordinators responsible for talent development initiatives. These interviews focused on organizational perspectives, particularly the strategies and challenges involved in supporting Para athletes. Discussions also addressed systemic barriers, such as access to specialized equipment and the integration of athletes with acquired impairments into the elite pathway. All interviews from Phases 1 and 4 were recorded, transcribed, and analyzed using thematic template analysis. This method allowed for a balance between deductive coding, based on the framework and prior research, and inductive coding, which captured new themes emerging from the data.

Crabtree and Miller's (1999) immersion/crystallization approach guided the analysis process, enabling researchers to iteratively refine codes and themes. The lead researcher began by familiarizing themselves with the data through repeated listening and review of transcripts. Initial codes were generated and validated collaboratively with a second researcher to ensure reliability. Themes were then grouped according to developmental phases, including attraction,

retention, competition, talent identification, elite, and retirement. This approach provided a comprehensive overview of athlete pathways in GB Para track and field.

Survey data from Phases 2 and 3 were analyzed using SPSS. Statistical techniques included one-way analysis of variance (ANOVA) and t-tests to explore differences between groups based on variables such as impairment type (acquired vs. congenital), event discipline, and classification. For example, ANOVA was employed to compare talent development phases across different event groups (e.g., throws, jumps, sprints, and distance). T-tests examined specific relationships, such as the age at which athletes with congenital impairments began participating in athletics compared to those with acquired impairments. These analyses provided nuanced insights into how individual characteristics and structural factors intersect to shape developmental trajectories.

One of the study's strengths was its triangulation of data across phases. The qualitative findings from Phase 1 informed the design of the quantitative surveys in Phases 2 and 3, ensuring alignment between methods. Similarly, the insights gained from the stakeholder interviews in Phase 4 were used to validate and expand upon earlier findings. This iterative process enabled a comprehensive understanding of the factors influencing Para athlete development.

Given the specificity of the sample population, maintaining participant anonymity was a priority. Identifying details such as event classifications, achievements, and demographic characteristics were excluded from the results to prevent inadvertent identification. Participants provided informed consent, and the study adhered to ethical guidelines for research with vulnerable populations.

Results

The quantitative and qualitative findings are integrated, and the results of the study are structured in accordance with the six developmental phases identified by Patatas, De Bosscher, Derom and Winckler (2020) in their Athletic Career Pathways in Paralympic Sports framework. To accurately reflect the findings, and, as suggested in the literature (see Patatas, De Bosscher, Derom & De Rycke, 2020; Patatas, De Bosscher, Derom & Winckler, 2020; Patatas et al., 2021), retention and competition phases are presented as one. Overall, the study found some areas of similarity with observations made broadly in Para sport by Patatas and colleagues (*ibids*) but also identified new themes within the phases specific to GB Para track and field. These were (1) the type of schooling an athlete attended (attraction), (2) the need for specialist equipment to enable participation (competition and retention), and (3) the track and field event discipline an athlete competed in (all phases).

Attraction

At the inception of the Para athlete career, the findings indicate that the attraction of individuals to Para track and field varies by individual but that their impairment type impacts access to specific entry routes e.g., part of a talent ID programme (acquired) or at a grassroots recreational participation (congenital) level.

> 'I have a couple of athletes that came to me directly from talent days,
> they'd not done athletics before, but attended an open day type thing.
> They went straight on to a support programme' (Participant 10).

The attraction and retention of athletes is subsequently impacted not only by the nature of their impairment (acquired or congenital) but also by their microenvironment, for example, the type of schooling (e.g., Special Education Needs schooling) that an individual attends.

> ‘She started throwing at school, they did the club throw, and she really enjoyed it, that’s when they (her parents) started to look into where she could do it more out of school. They contacted UKA, who put them in touch with me, I live not far away, that’s lucky really’ (Participant 8).

The mean age that Para athletes (n=42) within the survey reported that they first participated in athletics was 16 years old (M=16 SD=7), and they typically reported specialisation in an event at age 20 years old (M=20, SD=6). An independent t-test identified a significant effect of the nature of impairment (acquired/congenital) and the age Para athletes first participated in track and field ($t(38)= 5.330$, $p=0.002$). Meaning, that both a Para athlete’s introduction to the sport and their specialisation in a specific event are influenced by whether their impairment was from birth or acquired later in life. This observation is further supported by the qualitative data: the nature of an athlete’s impairment influences their type of schooling, which in turn impacts an athlete’s introduction to Para specific track and field events (e.g., seated throws and wheelchair events). For example, Participant 6 attended an independent school for young people with disabilities or special educational needs.

> ‘I first had a go at school, we had people come into school to introduce us to disability sports, we could have a go in race chairs’ (Participant 6).

Athletes with both congenital impairments and impairments that were acquired before school age reported participation in non-disabled sport in the attraction phase, typically through mainstream schooling and sport clubs. These participants were athletes in higher functioning classifications.

> ‘I was in the school rugby and football teams and did triathlons at the time, so quite sporty. I think up until that point when people said I should pursue athletics, I was pretty much good at everything, well not good at everything,

but tried everything, did everything and had no specific interest in one sport' (Participant 2).

Being signposted to Para sport-specific participation opportunities in the attraction phase by physical education (PE) teachers, local coaches, and chance encounters, was cited as fundamental to taking up the sport initially.

'When I was growing up, I was football mad - wanted to play football and loved playing on my bike and all sport really... the suggestion to try athletics was at school, yes it was at school, my PE teacher, he suggested I went to a Paralympic sports talent day…' (Participant 4).

Several high functioning athletes recalled introductory sport participation in non-disabled environments as well as chance encounters with friends and family that signposted Para sport. This led to Para track and field awareness and introduction:

'I did able-bodied first and saw the qualification distance [for Para] was well within my reach, but never pursued it until someone said one of our friends knew a friend who was in the Paralympics, come along to an analysis day they're having at Stoke Mandeville and then that's when they said I was eligible, this is the criteria what we have to get you classified as, attend national competitions and that's how it began, all from that friend of ours saying I should go to Stoke Mandeville' (Participant 1).

One participant recognised that Para track and field presented an opportunity to compete on a level playing field, rather than competing with non-disabled athletes.

'Because I have dwarfism, it's hard to specialise in a particular sport, so I've always played football with my mates, but I was never going to get anywhere.

> I wanted to go to the Paralympics when I was twelve years old. You always think, "I'm rubbish", and that, but I think they (parents) took me to Dwarf sports when I was five, and they inspired me as well to think, "Wow, I can compete on an even playing field"' (Participant 4).

The LTAD model was reported by participants to be problematic when applying it to Para athletics. The initial phase of LTAD focuses on children aged six to nine years old and the development of a broad range of FUNdamental Movement Skills (such as throwing, catching, running or jumping, and Fundamental Sport Skills). Whilst FUNdamental skills may be introduced in a school setting, the age at which Para athletes enter the sport means that they are already at the 5th and final stage of FUNdamental ('Training to win') and are event specialists.

> 'FUNdamental skills, yeah, brilliant for mainstream kids. But it's completely different for Para. There's some fundamental stuff that you can do, but they're [Para athletes] more specific and they want, they [Para athletes] know what they wanna do. They know what events they want to do; they are specific, they know what they can and can't do' (Participant 10).

Sport participation experiences in the attraction phase were varied and, as shown through the interviews, depended on several factors, including the nature of the athletes' impairment, non-disabled sport accessibility, and introduction to Para specific event disciplines.

Retention and Competition

Athletes must be classified before they can compete in Para track and field events. Therefore, classification must be achieved before event specialisation and competition. Within the quantitative data, Para athletes (n=42) reported a significant difference in the age at which they focussed on a specific event(s) ($t(38) = -5.435$, $p = .015$): M=17 for Para athletes with congenital

impairments athletes and M=27 for Para athletes with acquired impairments. The ten-year difference between mean congenital and acquired impairment event specialisation may be explained by consideration of the age of acquisition. For example, as noted in the attraction phase, athletes acquiring their impairment in adulthood are not introduced to Para track and field until after impairment acquisition, whilst they may have reported participation in non-disabled sport before acquisition of impairment. Only one participant with an acquired impairment reported participation in competitive sport before impairment. Within the qualitative data, athletes recall getting classified as a key factor in enabling competition. Competition is acknowledged as the intermediate phase leading to talent ID. Within Para track and field, the participants noted that the combined competition and retention phase was frequently short (<3 years), and for some, both phases were bypassed. For example, when the attraction phase was instigated by a specific talent ID campaign or event, Para athletes reported omitting the attraction, competition, and retention phases entirely, progressing rapidly to international competition.

> ‘I started as an under 13's, I did two years as an under 15 and it was the second year as an under 15 that I started competing internationally as a disabled athlete’ (Participant 1).

During the competition phase, Para athletes were frequently identified as talents by national coaches while participating in regional competitions. Para athletes who can compete in non-disabled competitions, compete in regional and national competitions early in their competitive careers, as reported by this participant.

> ‘When I started, before Sydney, no one at the club knew about Para, now most clubs know, like its better, they can signal you towards UK and squad

> weekends. It could be better, it would be better if people with disabilities could just join in at the local clubs more if there was that option' (Participant 8).

During this phase, it is UK Athletics, the National Governing Body, and the Official World Athletics Classifiers that are essential in enabling Para athletes to compete. Once classified it can be a challenge to find Para specific competition opportunities. National classification-specific competitions are limited, due to there not being enough competitors for a viable field in some event classifications domestically.

A coach acknowledged the varied competition picture, depending on whether athletes can compete with and alongside non-disabled athletes. The retention phase can be hindered by challenges in identifying and accessing clubs, coaching, Para sport-specific development programs, and competitions. Athletes reported that progression through the retention stage has an element of chance. There is a reported difference between athletes who compete in non-disabled competitions and those who are only able to compete in Para events, with athletes who can compete in non-disabled competitions having increased opportunities.

> 'Often there aren't enough, not in the UK, some athletes can compete in non-disability comps, or there are combined classes. The athletes will be competing by a points system, chasing qualification (standards), PBs [personal bests] and against the World Record. There can also be combined classes internationally too' (Participant 8).

Para athletes who completed the survey (n=42) provided insights into their competition experiences. In evaluating the overall structure of national competitions, 32% of athletes rated it as 'fairly high', while 35% described it as 'reasonable'. When examining national competition frequency, 17% of Para athletes rated it as 'very high', with 45% rating it as 'fairly high'. Coaches, in turn, provided their perspectives in a separate survey (n=38), with 34%

rating the national competition frequency as ‘fairly high’ and 31% as ‘reasonable’. Additionally, the standard of competition facilities in the UK was rated as ‘very high’ by 30% of athletes and 40% of coaches, with 35% of athletes also rating them as ‘fairly high’.

Additionally, Para athletes in the sample were grouped according to classification (e.g., T35-38 & F35-38) and event (e.g., throws, jumps, sprints from 100m to 400m and distance from 800m to marathon). A one-way ANOVA identified a significant effect of event group and rating of competition facilities ($f(1,38) = 4.675$, $p = .037$). A Tukey post hoc test was used to compare the means of the different event groups to see which events were different from each other, it revealed that there was a statistically significant difference in event groupings between the track and field ($p = .027$). Indicating that the quality of competition facilities is rated differently depending on whether athletes are competing in track events or field events, with track athletes generally reporting better facilities.

As well as the variance between those who can compete in non-disabled competitions and those who can’t, the qualitative data identified by specific impairment types. The specific needs of athletes with learning disabilities were also acknowledged by coaches, parents and carers as playing an important role in the retention phase.

> ‘She needs to be well known by her coach. They need to understand her needs. I went to The Worlds and did all her training there; I was her personal coach there right up to the time when she went to go into the competition and handed over to the National Coach. If you don't know her, you're just not going to say the right things to understand her. I'm working very closely with him [National Coach] now so that when we get to the Paralympics where I can't be there, he knows the right things to say and how to say them, so he's learning from me’ (Participant 11).

For many, athlete competition appears to be a component of retention, and the two phases occur simultaneously. One athlete reported competing on the world stage with little competitive experience, further evidencing that a Para athlete may bypass phases, and that attraction, retention, competition and talent ID can occur simultaneously rather than sequentially.

> 'I went to the World Championships this year without much of a clue what I'm doing and I'm still in the technique development stage' (Participant 7).

A one-way ANOVA also found there was a statistically significant difference in event group and event specialisation age ($f(1,38)=10.082, p=.003$). Further, a Tukey post hoc test revealed that there was a statistically significant difference in event specialisation and event group between the throwing event group and the sprints event group ($p = .011$), with Para athletes specialising in throwing events at a significantly older age than those specialising in sprints.

Talent Identification and Development

The participants in the study reflected on their individual talent ID and development journeys. Whilst some participants entered the sport through Talent ID, the findings indicate that focusing on individuals at an early age rather than at all ages may be misguided, as demonstrated by an athlete participant who acquired their disability in their late thirties and began participating in seated throws, aged 41. Talent campaigns should be inclusive of the diversity of Para athlete population, taking into consideration athletes that acquire impairments later in life.

> '…with the benefit of hindsight, I had seen stuff around athletics talent days… I think at one point, I remember seeing something that said, "If you're aged between 14 and 25" and I'm 41 and, to be fair, I don't look like a traditional thrower, so I don't think I would ever have come through the traditional route.

> But I hadn't even seen it, I didn't even know it existed, and I'm pretty sure there's loads of other people in the same position' (Participant 7).

Athlete participants acknowledged a pivotal time when they chose to change their coaching support for more event-specific expertise or disability-specific experience to develop their talent and progress through this phase and reach the elite phase. Athletes with no care or specialist expertise consistently sought coaches with a track record of international track and field success. By comparison, athletes competing in events specific to Para track and field (e.g., wheelchair racing) with care or support needs (e.g., a guide runner for visually impaired athletes) or equipment requirements (throwing frame) were identified by or pursued coaches with understanding and experience of their impairment, rather than international Para sport success, to develop their talent further.

> 'When Disability Sport Wales took me under their wing before Beijing, I was coached by a club coach at the time, and they supported him, and he was great, but he realised himself that he wasn't for me to qualify for Athens … through Disability Sport Wales … I was introduced to the national coach. He worked for UK Athletics, so I went to train with him' (Participant 1).

When rating Para athlete experience of the national approach to talent ID and development, 30% of respondents in the Para athlete survey rated this as 'fairly high'. An independent t test identified a significant effect of the nature of impairment and rating of talent ID and development ($t(38) = 0.545$, $p = .046$), indicating that athletes with congenital and acquired impairments cited a significantly different satisfaction level with the national approach to talent ID and development. Athletes with congenital impairments reported higher levels of satisfaction, whereas athletes with acquired impairments were less satisfied. Whether an athlete's impairment is acquired or congenital also influences their satisfaction with the support

received during their talent development journey. This was not discussed in the interviews, therefore, it is not possible to speculate why athletes felt these levels of satisfaction, presenting an avenue for further investigation. Nearly half (49%) of all coaches rated the support they received through UK Athletics talent ID and development programmes as 'fairly high'.

Elite

The participants in this study all experienced rapid progression to elite levels, with some skipping phases, as exemplified by Participant 7 in the talent ID phase and Participant 1 in the competition and retention phase. For example, 48% of athlete respondents stated that they specialised in their current event over the age of 18. An independent t test identified that there was, however, no correlation between age and first participating in Para track and field and international success, exemplifying elite phase as determined by highest IPC ranking.

> ‘I started as an under 13s. It was as an under 15 that I started competing internationally as a senior disabled athlete, so I'd done a couple of years as a club thrower, and I was winning the discus … I was able to compete every weekend. Within a couple of months of classification, I qualified for the IBSA World Championships which is the International Blind Sport Association, and I was selected to compete at the World Para Track and Field Championships in Canada so that's the first competition I did and that's where it really took off…. within a few years, I was young’ (Participant 1).

Experiences through the elite phase were comparable for both track and field athletes and across different classifications. Like Participant 1, Participant 5 also experienced rapid progression from first being attracted to the sport and participating to competing in world events and winning medals:

> ‘My first international race was at the Paralympic World Cup in [redacted]. I then set a new world record in [impairment redacted] sprinting at the [event redacted], I ran [time redacted], I had my first international, in the same year as I won the Paralympics, yeh – was really quick, my life changed completely. It all happened really quickly; I was 18 when it was the Paralympics in [redacted]’ (Participant 5).

Coaches also commented on this, citing that rapid progression to the elite phase was commonplace.

> ‘It’s not unusual for us to find, identify a fourteen-year-old and she’s winning global medals at fifteen’ (Participant 10).

One athlete recognised the importance of an elite team of coaches to support their needs as an elite Para athlete and cited the importance of an evidence-based approach.

> ‘He's (athletes coach) the best in the world, he coordinates it all, him and the assistant coaches I work with the setup is elite, professional…it’s spot on, I train and work with the best coaches and support in the world, everything we do is evidence and science-based…obviously a lot of that comes from sprinting for able-bodied and we just adapt it a bit, he has coached both Olympic and Paralympic champions, when I moved to him he was the only coach to have done that, in any event, he's awesome really’ (Participant 5).

Regular participation in international competitions is an element of the elite phase, and the survey asked Para athletes and coaches to reflect on this. The results demonstrate a varied experience. When asked to rate the frequency of competition, 37% of Para athletes rated the frequency of international competition as ‘very high’ or ‘fairly high’ but 18% as ‘very low’.

International competition opportunities in the UK were rated poorly, 53% of Para athletes rated them as 'fairly low' or 'very low'. This was supported by 42% of coaches rating UK international competition opportunities as 'fairly low'. Statistically, there was no significance between different event groups and international competition rating. There was a statistical difference between the nature of impairment and rating of international competition opportunities ($p=0.021$), indicating further variation in the experience of athletes with acquired and congenital impairments. A one-way ANOVA demonstrated a statistical significance between event coached and international classification-specific competition opportunities ($F(3,28)=3.122, p=0.041$). International competitions are dependent on appropriate facilities through the elite phase, and coaches of different events reported different levels of satisfaction with competition facilities. This finding indicates that there is also variation between event disciplines and international competition opportunities, impacting Para athletes' elite phase experience. This may be caused by the ability to integrate with non-disabled competitions e.g., amputee athletes racing non-disabled athletes or 'road-based' wheelchair races e.g., London Marathon, providing increased elite competition opportunities.

Voluntary or Involuntary Retirement

The final phase of an athlete's career pathway is retirement. As the Para athletes in this study were required to have been selected for WCPP, the participants able to comment on retirement were limited and restricted to those who had been selected for WCPP but were forced into involuntary retirement. An involuntary retirement can be caused by an impairment progression due to degenerative diseases, in which the athlete can undergo (re) declassification. This may result in changes in their sport class or ineligibility. Another example is when a class event is removed from the Paralympic Games program. One participant reported involuntary retirement due to event removal from Paralympic schedule and subsequent removal of funding.

> ‘After the Paralympics I was a funded athlete and continued training until I found out that my event had been taken out of the Paralympic Games … I was then removed from funding. I moved home from The National Performance Centre. I just couldn’t continue with the same level of training. I did carry on for the next season but because I'd left …and without really much of a goal to continue to work towards I stopped training and stopped competing’ (Participant 1).

Discussion

As critical realists, our relativist epistemology induced us to explore GB Para track and field athletes’ career trajectories from the perceived realities of the individual athletes and their coaches. In doing so, this study provides insight into the cultural context that has shaped the individual career journeys of this unique group across the phases of athlete development. The participants brought a located, interpreted reality, which we interpreted through our cultural lens, striving to mitigate bias. Our realist ontology and interpretation endeavoured to speak to the situated realities of our participants, but we recognise that others’ interpretations may yield nuances in our findings (Braun & Clarke, 2022).

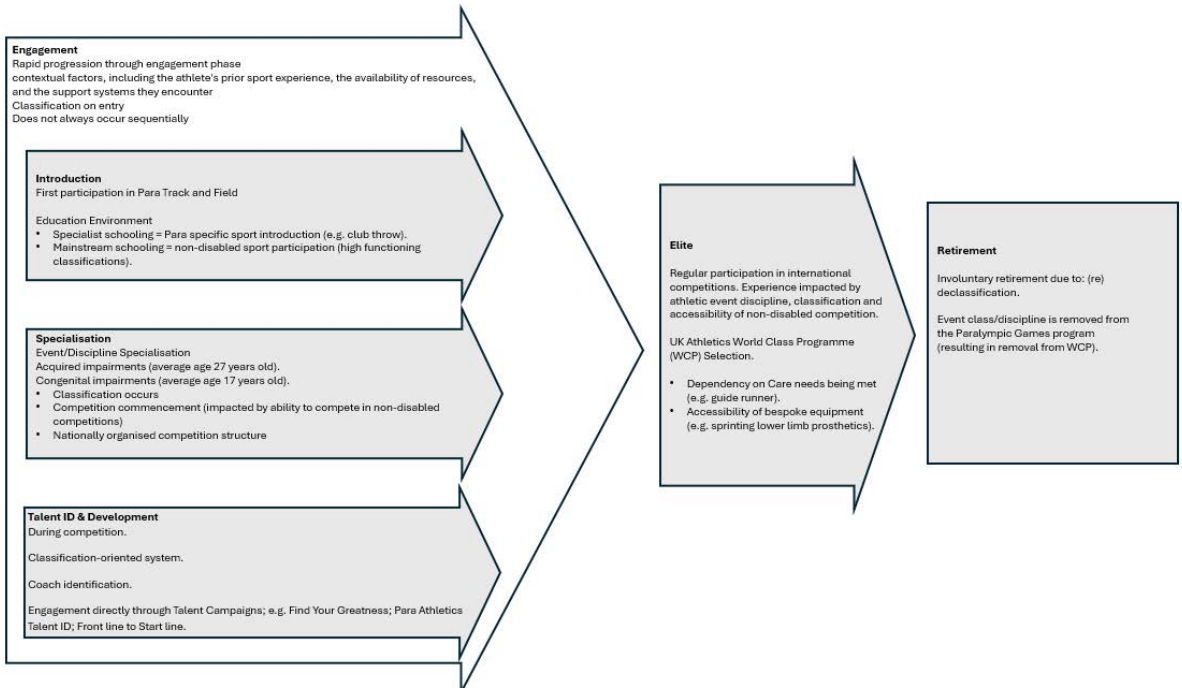
Figure 1 illustrates the developmental journey of GB Para track and field athletes based on the synthesized findings of this research. Crucially, the analysis revealed that the nature of an athlete’s impairment, whether congenital or acquired, profoundly impacts the early stages of their career. Congenital impairments often lead to earlier engagement and specialization, while acquired impairments may result in delayed entry into Para sport, also noted by Dehghansai et al. (2021) and Huxley et al. (2017). This variability leads to considerable overlap between the phases of Attraction, Retention, Competition, and Talent ID/Development, which challenges

the traditional linear framework proposed by Patatas, De Bosscher, Derom, and Winckler (2020) in their Athletic Career Pathway in Paralympic Sports.

To address the complexity of these early career phases, we argue for their integration into a single, overarching phase of Engagement. This phase includes three parts - Introduction, Specialization, and Talent ID and Development - each representing different levels of engagement with Para sport. The sequence of these parts is flexible, as athletes might bypass or reorder these stages depending on their entry point into Para sport. Supporting earlier observations made by Storli, Aune and Lorås (2022). For instance, athletes introduced to Para sport at a disability school might follow a linear progression from Introduction to Specialization and then to Talent ID, while others, such as those attending Talent ID campaigns, may skip the Introduction phase entirely, entering the pathway at a more advanced stage.

This revised framework acknowledges the fluidity and adaptability required for Para sport athlete development. It aligns with Rudd, Barnett, and Butson's (2023) emphasis on the interplay of individual, environmental, and task constraints in shaping athletic trajectories. By framing Engagement as a dynamic and context-sensitive process, this framework better accommodates the diversity of pathways observed in GB Para track and field athletes and offers broader applicability across cultural and Para sport-specific contexts.

Figure 1: Para Track and Field Career Pathway



The findings suggest that 'Introduction' is more befitting than 'Attraction', as someone can be introduced to a Para sport but may not be attracted to it. This also offers broader applicability of the framework to scholars who may wish to consider the Para sport trajectory of those who pursue it as a career or those who face barriers and/or do not enjoy the Para sport and leave the pathway. Within this phase, schooling and prior exposure to non-disabled sports take a prominent role in shaping an athlete's developmental trajectory and entry point into Para sport. Athletes who attended mainstream schools are more likely to have participated in non-disabled sports during their schooling, which provides foundational skills transferable to Para sport. Whereas those who attended specialist schools for children with disabilities participated in Para sports during these early years. Further, access to inclusive facilities and support systems during schooling is crucial. These findings reflect the experiences of other Para athletes in other cultural settings (see Dehghansai et al., 2021; Patatas, De Bosscher, Derom and Winckler (2020); Rudd, Barnett & Butson, 2023; Storli et al., 2022), indicating that schooling contexts play a pivotal role in shaping when and how athletes enter Para sport, with implications for talent ID and developmental pathways.

Specialisation refers to athletes focusing on a specific discipline, dedicating themselves to refining their skills with targeted coaching and support. It differs from the Retention and Competition phases as it does not have to follow Attraction, and whilst it incorporates classification and competition, it is not restricted to this. Specialisation may be a phase bespoke to track and field, and further consideration of specialisation (e.g., distance competed in cycling, swimming stroke/distance) in other Para sport contexts is needed to confirm its position in this framework. Typically, GB Para track and field athletes focus on one or two events as specialists, first participating in the sport at 16 and specialising in an event by 20. This is late compared to other Para sports, for example, 17 is the average age for Olympic-level athletes to specialise in a specific event (De Bosscher et al., 2023; Mosher et al., 2020; Storli et al., 2022). This is, however, not necessarily a bad thing as others warn that early specialisation can increase the risks of injury, burnout, and psychological stress (Jayanthi et al., 2020; Storli et al., 2022). Further, research on UK non-disabled athletes shows that early specialisation in age-group levels, such as under 13 and 15 year olds, does not strongly correlate with long-term performance or retention, highlighting the value of diverse athletic experiences during the formative years (Moesch et al., 2011). In track and field, athletes tend to specialise based on their unique physiological attributes, environmental factors, and, particularly in Para sport, classification (De Bosscher et al., 2020; Storli et al., 2022). These findings emphasise the importance of flexible, individualised developmental pathways.

A key finding of this study is the role of impairment type in determining the timing of specialisation. Athletes with congenital impairments tend to specialise earlier, around age 17, while those with acquired impairments often specialise later, around 27, consistent with the findings of Dehghansai et al. (2021). This suggests that career trajectories in Para sport are influenced not only by environmental and physiological factors but also by the nature of an athlete's impairment. These findings challenge the traditional linear model of specialisation,

suggesting that event specialisation in Para sport may not follow the same trajectory as seen in non-disabled athletics, where specialisation typically occurs at a later age. The variability in specialisation timing highlights the need for flexible pathways that account for individual impairments and athletic contexts. These insights are crucial for developing more personalised approaches to athlete development, especially in Para sport, where event specialisation may also be influenced by factors such as classification.

The opportunities available to Para athletes during the Specialisation phase are shaped by factors such as the feasibility of competing alongside non-disabled athletes, the need for Para-specific events (e.g., a nationally organised competition structure) and the existence of separate elite circuits (e.g., wheelchair road races), and Para-specific facilities (e.g., seated throwers needing anchor points and to take all throw attempts consecutively). Access to quality competition facilities and opposition is crucial for progression to elite status, as it allows athletes to refine their skills in appropriate settings (Pereira, 2017; van der Merwe et al., 2014). Para athletes who compete alongside non-disabled athletes generally participate in events where their impairments do not significantly hinder their ability to compete on equal terms. These athletes often possess physical attributes (such as strength, speed, or endurance) that allow for parity despite differences in classification. Furthermore, some may compete in mixed categories where classification systems adjust for impairments, ensuring fair competition, as seen in swimming (Bale, 2008) and cycling (van der Merwe et al., 2014).

Within the Talent Identification and Development (Talent ID) phase, the findings of this study align with previous literature, although the linear, sequential model of Talent ID and development is challenged. Talent ID plays a crucial role in identifying and nurturing athletes with the potential to succeed in Para sport. In classification-oriented systems, this phase typically starts through multiple pathways, such as competitions, coach recommendations, and dedicated Talent ID campaigns (Patatas, De Bosscher, Derom and Winckler (2020). These

pathways provide athletes with access to essential resources and developmental support. Research highlights the importance of Talent ID campaigns, particularly those targeting underrepresented or emerging impairments, in promoting Para athletes' engagement and ensuring they are appropriately classified for elite competition (De Bosscher et al., 2020). Furthermore, specialised developmental programmes offer critical coaching, training facilities, and opportunities for skill refinement, which contribute to athletes' progression to higher performance levels (Fitzgerald & McGrath, 2022). These findings support the notion that well-structured Talent ID and classification processes are fundamental to both the recruitment and long-term development of Para athletes. However, this study deviates from the traditional linear approach, suggesting that Talent ID and development may not always follow a fixed sequence. Instead, these processes could be more flexible and adaptable, reflecting the diverse pathways that Para athletes may take in their journey to elite competition.

The flexibility within the Engagement phase reflects the non-linear, highly individualised nature of Para athlete development. The sequencing of these Engagement levels depends on factors such as prior sport experience, the severity of impairment, the availability of resources (e.g., bespoke equipment, coaching expertise), and the support systems encountered by the athlete.

The Elite phase in Figure 1 is characterised by Para athletes consistently competing in high-level international competitions, which are crucial for refining their performance and achieving peak results. Therefore, this is where the model returns to the athletic career pathway proposed by Patatas, De Bosscher, Derom, and Winckler (2020). This phase is strongly influenced by factors such as the athlete's specific event discipline, classification, and the availability of inclusive competition opportunities alongside non-disabled athletes. In this context, the UK Athletics World Class Programme (WCP) plays a pivotal role in identifying and supporting elite Para athletes. Success in the Elite phase also relies on meeting specialised care needs, such

as providing guide runners for visually impaired athletes, as well as ensuring access to tailored equipment like advanced limb prosthetics for sprinters. These elements highlight the unique and highly specialised nature of Para track and field athletics.

A key observation is that Para athletes often integrate into the same elite sports system as non-Para athletes, such as The English Institute of Sport in the UK. While Para athletes share many of the same needs as their non-disabled counterparts such as financial support, career guidance, access to training facilities, and coaching, there are distinct differences. The specific challenges faced by Para athletes include issues such as facility accessibility, the need for coaches with disability-specific knowledge, and the frequency of competition. Consistent with the research by Patatas, De Bosscher, Derom, and Winckler (2020), athletes with more severe impairments often face delays in reaching the Elite phase due to limited opportunities in the sport, a shortage of qualified professionals, and challenges within the competition system. In contrast, athletes in higher functioning classes or those in less competitive classifications tend to progress more quickly.

This study challenges the relevance of age-related models, such as the LTAD model (Balyi et al., 2013), for Para athletes, particularly those with acquired impairments. While age-based models have been widely adopted in various sports, the heterogeneous nature of Para athletes' impairments and developmental histories suggests that such models are not suitable for Para track and field. This aligns with findings from Dehghansai et al. (2020) in wheelchair basketball, which highlight the unique developmental trajectories of athletes with acquired impairments. Further comparative research is needed to confirm these findings.

The Retirement phase in Para athletics can often be involuntary, driven by changes in classification or the removal of an event class from the Paralympic Games programme. This research found that such changes may render athletes ineligible to compete in their event,

leading to their removal from the WCP and potentially resulting in premature retirement. This finding highlights the vulnerability of Para athletes within the sport system and the challenges they face in navigating these unplanned transitions. Patatas, De Bosscher, Derom and Winckler (2020) describe the Retirement phase of an athlete's career as a challenging transition, especially for Para athletes. This phase involves adjusting to life post-competition, dealing with the loss of athletic identity, and managing the impacts of long-term impairments. For Para athletes, the retirement process is further complicated by the need for emotional and social support, and opportunities for non-competitive involvement in sport. Patatas, De Bosscher, Derom and Winckler (2020) stress the importance of providing proper resources, including career development and mental health support, to help athletes navigate this stage successfully.

This study proposes a more dynamic and adaptable framework for understanding Para track and field career pathways, which accounts for the variability and individualised nature of athlete development. By embracing the non-linear and context-dependent progression through stages, the framework offers a more inclusive approach to Para athlete development, better reflecting the diverse challenges and opportunities that athletes encounter. This not only provides a more accurate representation of Para athlete pathways but also serves as a foundation for future research and the development of more effective Para sport programmes.

The findings of this study prompt a call on others to examine the development pathways of Para athletes in other sports and cultural settings to contribute to the accumulation of knowledge which a specific Para sport development model and/or theory can be built on. For practitioners, the findings indicate a need to be cognisant that the range of events within Para track and field as well as classifications further demonstrates the unsuitability of a one-size-fits-all approach across Para sport broadly. Talent programmes must take into consideration the nature of impairment as well as the event discipline. For participation and progression accessibility of equipment and competitive opportunities must also be addressed.

Conclusion

Utilising established athlete development models to outline athletic career pathways from the literature, this study sought to delve into the Para athlete development phases and career pathways for Para track and field athletes. It uncovered that Para athlete development is not linear and the intricacies of the developmental phases called for the creation of a new framework. This study revealed Para track and field specific traits that exert an influence at each stage, these intricacies included the feasibility of participation in non-disabled sport, an individual's education environment the impact of impairment nature on athletic discipline specialisation and the importance of classification for competition.

There are only a limited number of studies that have applied sport development models to Para athletes in an attempt to chart Para athlete careers, and even fewer in a sport-specific context. This study contributes to a small, albeit growing, body of knowledge on Para athlete career pathways and offers new insight into the application of sport development models in Para track and field specifically. The application of sport development models to Para sport holds significant potential for enhancing the development and understanding of athletes with impairments. By identifying and nurturing talent, optimizing performance, and providing appropriate support, these models can enhance the Para athlete experience, increase performance standards, and contribute to the growth and success of the Paralympic movement. However, it is essential to address the challenges related to the nature of impairment, access to equipment and coaching, as well as facility access to ensure inclusivity. Whilst several studies address access to participation opportunities (e.g., Jeanes et al., 2018; Moran & Block, 2010; Quinn et al., 2022), more empirical studies are needed to address specifically as an entry to elite Para sport. With the athletic career pathways of Para athletes being so limited in understanding, there is scope to increase empirical evidence across a range of Para sport contexts, including winter sports, team/individual Para sport, those within the governance of

non-disabled sport (e.g. Para swimming) and those that are disability specific (e.g. Boccia), as well as Paralympic v non-Paralympic sports. Through collaborative efforts and a data-driven approach, the Para sport community can work towards a more inclusive and comprehensive elite sport development framework for Para sport, considering the need for sport-specific contexts, fostering excellence and empowering athletes with impairments on the global stage.

A limitation of this study is its sampling from one nation with a well-developed pathway for Para athletes. The inclusion criteria mean not all event disciplines are included in the sample population. Therefore, some Para athletics events are not represented in the findings, and the heterogeneous nature of the global Para athlete population makes generalization challenging. A study which includes athletes from a range of nations, covering all event disciplines, and testing the findings of this study is recommended.

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