**Doping in disabled elite sport: Perceptions, knowledge and opinions from the perspective of German and UK coaches**

Kathrin Weber*1*, Laurie B. Patterson2, Cornelia Blank*1*

1Institute of Sports Medicine, Alpine Medicine & Health Tourism, UMIT TIROL, Private University for Health Sciences, Medical Informatics and Technology, Eduard-Wallnöfer-Zentrum 1, 6060 Hall in Tyrol, Austria; kathrin.weber@umit-tirol.at; cornelia.blank@umit-tirol.at

2Carnegie School of Sport, Leeds Beckett University, Fairfax Hall, Headingley Campus, Leeds, LS6 3QS, United Kingdom; L.Patterson@leedsbeckett.ac.uk

Corresponding author:

Prof. Dr. Cornelia Blank,

Department of Psychology and Sports Medicine

Institute of Sports Medicine, Alpine Medicine & Health Tourism, UMIT TIROL

Eduard-Wallnöfer-Zentrum 1, 6060 Hall in Tirol, Austria

Phone: +43 (0) 50 8648 3840

cornelia.blank@umit-tirol.at

**Abstract**

*Objectives:* The phenomenon of doping is rarely researched in Paralympic sport, especially from the coach perspective. This study responds directly to this gap in research by exploring coaches’ doping-related perceptions, knowledge, and opinions of the current anti-doping system in order to inform future interventions specific to disabled elite sport contexts.

*Method:* Eleven coaches from Germany (n=6) and the UK (n=5) working across physiological (n=7) and skill-based (n=4) sport disciplines at an elite level (Paralympic, n=10 and World Championship, n=1) took part in semi-structured interviews. Data were analysed using abductive reflexive thematic analysis (Braun & Clarke, 2019a).

*Findings:* Four themes were developed to capture the coaches’ perspectives. The first represents coaches’ perception that doping is an issue in Paralympic sport. The second theme shows that risk factors to dope are typically multiple and intertwined, stemming especially from financial incentives and pressure to win. Theme three captures coaches’ opinion of differences in testing and education across countries due to budget, resource, or infrastructure issues. Finally, data showed that coaches prefer to refer responsibility for doping prevention to their national anti-doping organisation, rather than taking on personal responsibility for anti-doping efforts.

*Conclusions:* According to the interviewed coaches, doping has the potential to be a big issue in disabled elite sport. The main risk factors of money and pressure to win (earn prize money or funding/sponsorship) are knitted together and can be additionally impacted (negatively) by a nation’s sporting system. These factors should be addressed by thinking both on an individual level (e.g., support dual careers) and a structural/policy level (e.g., aim to have minimum standards to level the global inconsistent anti-doping systems, including anti-doping education/testing). Furthermore, coaches should take their role and be proactively made aware of their responsibility in doping prevention to coach clean and protect their athletes properly.

**Keywords**

Disabled elite athletes, coach, doping, drug use in sport, anti-doping system, thematic analysis

**1. Introduction**

In recent years, the anti-doping research community in able-bodied elite sport acknowledged that an athlete-centred focus to understand doping might only reveal parts of the overall picture (e.g., Engelberg & Moston, 2016; Patterson & Backhouse, 2018). Indeed, researchers began to evidence that situational factors might play an important role in explaining doping behaviour (e.g., Allen et al., 2014; Gatterer et al., 2019). These factors include social agents like teammates, peers outside of sports (Lentillon-Kaestner & Carstairs, 2010), parents (Madigan et al., 2016) and coaches (Martin et al., 2014; Ommundsen et al., 2006). Coaches, in particular, have been recognised as influential agents in athlete (anti-)doping (e.g., Allen et al., 2014; Engelberg & Moston, 2016; Patterson & Backhouse, 2018). Specifically, coaches have been involved in encouraging and/or supplying athletes with prohibited substances and/or methods (McLaren, 2016; Ungerleider, 2001). But at the same time, coaches are also protective agents (Engelberg & Moston, 2016; Kirby et al., 2011; Patterson & Backhouse, 2018) and important sources of information concerning issues associated with doping (Blank et al., 2014; Engelberg & Moston, 2016). In fact, in the latest World Anti-Doping Code (WADC; hereafter referred to as ‘the Code’), coaches are described as *“role model[s] for athletes”* (World Anti-Doping Agency, 2021a, p. 137) who should adhere to guidelines and can be sanctioned if they do not. As such, coaches are expected to be responsible for (1) knowing the anti-doping rules and policies; (2) cooperating with doping tests; (3) using their influence to support athletes’ anti-doping attitudes; (4) informing relevant authorities of any prior involvement in doping; (5) complying with any investigations concerning doping issues; and, (6) refraining from personal use of prohibited substances and/or methods according to the Prohibited List (World Anti-Doping Agency, 2021a). The inclusion of coaches in the Code underlines how important they are seen to be in anti-doping efforts and justifies the need for them to be included as a key stakeholder in anti-doping research.

Several studies in able-bodied elite sport have focussed explicitly on coaches to examine their perceptions and actions concerning anti-doping. Research has found that some coaches embody a strong anti-doping stance (Allen et al., 2017; Blank et al., 2014). Similarly, the majority of coaches reject doping and describe it as ‘wrong’, ‘bad’ and/or ‘unfair (Engelberg & Moston, 2016; Patterson & Backhouse, 2018). Although coaches are aware of their influential role in doping prevention (Allen et al., 2017; Engelberg & Moston, 2016), the majority of coaches do not (pro)actively discuss doping, but rather wait and behave reactively when a matter arises (Allen et al., 2017; Engelberg & Moston, 2016; Patterson & Backhouse, 2018). This passivity might be explained by the fact that some coaches do not feel well-informed or knowledgeable about doping-related issues (e.g., Boardley et al., 2019; Patterson & Backhouse, 2018; Rodek et al., 2012). However, Blank et al. (2014) found that coaches had a good level of objective knowledge – yet, their good (objective) knowledge did not seem to modify their behaviour towards anti-doping measures (Blank et al., 2014). Some further possible contributing factors may be that coaches do not feel responsible to lead anti-doping efforts, instead, referring to others (e.g., team doctors, pharmacists, anti-doping officers) (Allen et al., 2017; Engelberg & Moston, 2016; Morgan & Smith, 2018). Another explanation might be that coaches do not think that doping is a problem in the sport they coach (Allen et al., 2017; Morgan & Smith, 2018; Rodek et al., 2012) and that their athletes are ‘safe’ (Allen et al., 2017; Patterson & Backhouse, 2018). This finding fits within the perception that anti-doping education is a waste of time and therefore an interaction is infrequent or only a couple of times per year (Engelberg et al., 2017). Taken together, these findings in able-bodied elite sport are not signalling consistent influencing factors for coaches’ perceptions of their anti-doping responsibility and actions of coaches concerning anti-doping. Furthermore, to our best knowledge, there is no research about coaches’ doping-related perceptions or knowledge in disabled elite sport. Consequently, research with coaches working with elite disabled athletes is needed to enhance our understanding.

In fact, anti-doping research in disabled elite sport is limited in general. So far, existing studies have predominantly chosen an athlete-centred focus to examine the issue of doping. The main finding from this evidence is that doping is an existing issue (e.g., Thevis et al., 2009; Van de Vliet, 2012). Corroborating the presence of ‘visible’ doping in disabled elite sport, the World Anti-Doping Agency (WADA) detected 159 Anti-Doping Rule Violations (ADRVs) between 2013 – 2018 (World Anti-Doping Agency, 2015, 2016, 2017, 2018, 2019, 2020a). Early research suggested that this might be caused by the growing profile of the Paralympic sport in recent years (Collier, 2008; Fagher et al., 2016; Jefferies et al., 2012). Beyond these early insights, very little is known about reasons for doping in elite disabled sport.

To address the lack of research in anti-doping in disabled sports, a broad research project was funded and implemented in Austria, Germany, Switzerland and the UK. In the first phase of the project (Weber et al., 2022), findings from an athlete sample supported earlier evidence that doping in disabled sport is becoming more of an issue due to the growing profile of the sport. In this first study to go beyond investigating prevalence/patterns of ADRVs, Weber et al. (2022) explored Austrian and UK-based athletes’ doping-related perceptions, reasons, knowledge, and opinion of the anti-doping system and found that doping seems to be mainly driven by money, as well as inconsistencies in the anti-doping system (e.g., less testing in some countries and/or uneven anti-doping education globally) that offer loopholes to cheat, such as via misuse of medications/unwarranted Therapeutic Use Exemptions. Of course, an athlete’s opportunity to dope by misusing medications would likely depend on their disability, in terms of what medications (that might have the potential to aid performance, recovery, etc) could be claimed as necessary to help manage the individual’s health. The heterogeneity of individuals’ disabilities can also impact their potential to dope – or ‘cheat’ – in other ways. For example, athletes with a spinal cord injury (SCI) at or above T6 could employ the performance-enhancing method - known as ‘boosting’ (voluntarily induced autonomic dysreflexia), which involves increasing one’s heart rate and blood pressure by, for example, sitting on sharp nails or distending the urine bladder. Notably, Sparkes and Brighton (2020) suggested that boosting among athletes with a SCI may be brought about by the structural obstacles they face, including the fact that they can only compete in a limited number of sports disciplines and the fact that the classification system is based on function and excludes those athletes from being ‘more’ successful. Thus, there is emerging evidence that there are both individual and environmental/structural factors impacting doping in disabled elite sport. As example for the latter, Mauerberg-deCastro et al. (2016) claim that there is a global imbalance in how disabled athletes have access and further opportunities in sport, especially in poorer countries. In detail, interviewed disabled elite athletes criticize the effectiveness of national anti-doping systems in those countries as athletes perceive a lack of doping tests and insufficient anti-doping education (Weber et al., 2022). The current study, which is the second part of the above-mentioned broader research project by Weber et al. (2022), seeks to broaden our understanding by investigating if these factors – and any others – are also identified by other significant parties (i.e., coaches) within disabled elite sport contexts.

In sum, to add to the scarce body of anti-doping research in disabled elite sport and by acknowledging the fact that coaches are detected to be important influences for athletes, the current study aims to engage with coaches working in disabled elite sport to explore their doping-related perceptions, knowledge and opinions of doping (e.g., prevalence, risk factors) and anti-doping (e.g., the role of organisations). As this study is the first to investigate the perspectives of coaches working in elite disabled sport, no specific theory has been adopted to understand doping behaviour in disabled elite sport from a coach’s perspective. Instead, this research represents an explorative approach to identify coaches’ views of doping in disabled elite sport. With this chosen approach, we aim to inform practical implications, e.g., which content could be helpful to foster anti-doping education for coaches, or which elements within the sporting system need to be targeted more closely. Our work can also provide a foundation on which a theory-based understanding of influencing doping factors/behaviour can be built in the future. The findings hone-in on coaches’ perspectives and triangulate/compare these with existing evidence from the athlete perspective. Moreover, the findings are meant to contribute to a better understanding of the complexity of doping in disabled elite sport.

**2. Method**

This research is the second part of a larger project aiming to develop an understanding of doping and anti-doping in disabled elite sport. Although the method is comparable to that reported in Weber et al. (2022) we have chosen a different sample group – coaches – that is not associated in any way to the athletes’ sampled in the first part of the project (Weber et al., 2022). They were neither the coaches of these athletes nor did they share any other connection to the previously sampled athletes. The interview guide and sampling procedure however is comparable to the approach used in the athletes’ study (Weber et al., 2022).

*2.1. Sample recruitment and participants*

Initial recruitment involved coaches from Austria and the UK. For participation in the study, the coaches had to: 1) be over 18 years of age, 2) coach a sport that is defined under the International Paralympic Committee (IPC), 3) have five years of experience coaching athletes at their highest level (national team and/or athletes who participate at international competitions), 4) currently coaching more than five athletes at their highest level, and 5) be officially recognized as a coach by his/her respective sport federation. During the sampling process, we realized that coaches in Austria either did not meet our inclusion criteria (e.g., coached less than five years) or did not respond to our invitations. Therefore, in line with our funded/ethically approved project proposal, we enlarged our sample to include coaches based in Germany. We have chosen Germany next, because it is one cooperation partner of the whole research project as well as a country in which we know that there are enough coaches who will meet our inclusion criteria. In total, we sent 54 invitation emails to organisations who govern elite disabled sport (according to the official IPC list) and/or sport officials in Germany and the UK, asking them to help with the recruitment of coaches. In addition, 25 coaches were directly contacted via their public email addresses on the sport organisation’s webpage. Based on contemporary thinking, recruitment ended when we were confident we had gained rich and detailed insights according to our research aim (Braun & Clarke, 2019b). Thus, as proposed by Braun and Clarke (2019b), we did not adopt the view that ‘data saturation’ was based on a pre-determined number of interviewees.

Overall, 11 coaches (female, n=1; male, n=10) with a mean age of 42.6 years (*SD*=11.5; [24;61]) were recruited (UK: *M*=33.6, *SD*=5.5; Germany: *M*=50.2, *SD*=9.6); of those n=10 participated due to our personal invitation. English-speaking (n=5) and German-speaking coaches (n=6) covered 11 different team and individual sports. Of those, n=7 were primarily physiological (strength and endurance, e.g., swimming) and n=4 skill-based (e.g., shooting) sport disciplines. At the time of being interviewed, all participants were coaching athletes on a Paralympic level except for one, whose athletes were competing at World Championship level. Coaches had a range of experience, with six participants coaching less than 10 years and five for more than 10 years. On average, participants coached disabled elite athletes for 8.5 years (*SD*=3.2) at their highest level of competition (UK: *M*=8.2, *SD*=3.7 years; Germany: *M*=8.8, *SD*=2.8 years). Based on the data protection regulations of our host institutions, no further information on socio-demographic details of the sample can be disclosed. For example, we cannot list the specific sports because it might endanger coach’s identity within smaller sport disciplines as the Paralympic coach community is rather small.

*2.2. Interview details*

This study was the second part of a larger research project and some details of the method have been previously reported in an athlete-focussed publication (Weber et al., 2022). The interview guide used with both coaches (in this study) and athletes (in Weber et al., 2022) explored doping-related perceptions, knowledge, and opinions in a disabled elite context. The seven sections of the guide were: 1) opening (e.g., Can you tell me about your coaching career to date?), 2) perception of prevalence of doping in disabled elite sport, 3) perceptions about the factors which lead to doping, 4) own definition of “clean athlete”, 5) perceived preventative measures in disabled elite sport (e.g., Are you aware of any anti-doping work being undertaken in your sport?), 6) perceived trustworthiness of sport authorities and agencies in addressing doping (e.g., Do you believe that organisations like the IPC or WADA can lead a collaborative movement for doping-free sport?), and 7) closing questions (e.g., Is there anything you would like to add?). For the full interview guide, please refer to the supplemental online material.

The use of semi-structured interviews allowed rich and detailed insights into coaches’ views and experiences (Smith & Sparkes, 2016) and, at the same time, consistency and comprehension was achieved because all interviewees were asked the same main questions (Sparkes & Smith, 2014). Within the interview process, it was possible to ask spontaneous questions, which came up during the conversation and gave the interviewee a certain range of flexibility (Braun & Clarke, 2013).

Before we conducted the individual interviews, all participants were asked to fill in a demographic sheet (e.g., age; coaching sport discipline) and provide informed consent. To develop trust and show that we are interested in them, we encouraged the coaches to ask questions about the project, talked with them before the interview (e.g., how they feel) and verbally assured that the interview is anonymous. Additionally, we explained that we will not name their specific sport or other socio-demographic data which might reveal their identity within a publication. All interviews were conducted by the first author at a ‘place’ (including virtual platform) and time of the interviewees’ convenience. While all UK interviews were conducted in person (November/December 2019), the German interviews had to take place via an online Zoom meeting or a phone call (May/June 2020) due to the Covid-19 pandemic. On average, the interviews lasted for *M*=46:35 minutes (*SD*=17:03) (Germany: *M*=45:12, *SD*=21:54; UK: *M*=48:14, *SD*=7:38).

*2.3. Data analysis*

With participants’ permission, each interview was audio-recorded to facilitate verbatim transcription. Names of the interviewees were replaced with pseudonyms to ensure their anonymity. To protect the identity of the only female we have used ‘he’ as the chosen personal pronoun for every person in the findings section. Prior to data analysis, every participant was invited to check their transcript for accuracy (Braun & Clarke, 2013). The software programme NVivo 12.6.0 (QRS International, 2019) facilitated the analysis process. A reflexive thematic analysis (Braun & Clarke, 2006) was chosen to abductively explore the transcripts in depth and identify central meaning. This process began with familiarisation of the coaches’ transcripts before we generated codes and grouped them into initial themes. Through a recursive (‘back and forth’) process, involving re-reading the transcripts, revising the codes, and discussing the overall themes as a team, we could summarize our data in four themes. For transparency, having performed an inductive reflexive thematic analysis with the athletes’ data in the first part of this research project (Weber et al., 2022), we were aware of being influenced by these findings. The four themes of the athletes were: (1) doping happens even in the Paralympics, (2) doping is driven by several factors, but especially money, (3) the anti-doping system works, but not completely, and (4) cheating on classification should be considered doping (Weber et al., 2022). Despite these known themes, we initially analysed the coaches’ data inductively, primarily searching for their deeper meaning and understanding in relation to our aims. In the following process of grouping the codes and developing initial themes, we compared our findings with the athletes’ codes and themes in a more deductive way (specific comparisons are made in our discussion). This revealed many similarities in the findings and helped us to clearly connect and differentiate the coach and athlete perspectives, before giving the final themes appropriate names.

*2.4. Philosophical underpinnings & research quality*

As reported in our athlete-focussed study (Weber et al., 2022), the research adopted an interpretative paradigm with the underlying theories of relativist ontology and constructionist epistemology (Sparkes & Smith, 2013). This means that we believe reality is influenced and shaped by social interaction and experience. Consequently, while interviewing the participants and co-creating the findings (Guba & Lincoln, 1994), we were fully aware of our own beliefs, values and autobiographies. In fact, as reflexive researchers, we acknowledge our biographies and influence in the whole process and were mindful of when and how this might have occurred. Hence, we want to explain what we have done to ensure that we co-created consistent findings which are based on the collected data and therefore established rigor in our research (e.g., Castleberry & Nolen, 2018; Smith & McGannon, 2018). During the analysis process, we have gone back and forth in the data to reveal the deep meaning and essence of our interviews. We deeply reflected on each interview after its completion, thought about possible interpretations of the interviews, and regularly discussed the wording of our findings. Taken together, we strengthened the research quality (e.g., coherence, credibility, rigour, width) and were confident we achieved our aim (e.g., Castleberry & Nolen, 2018; Smith & McGannon, 2018; Sparkes & Smith, 2014). We chose a purposeful sample of coaches who could offer insights into disabled elite sport. Furthermore, our findings are of significance and value to inform future research and interventions that are specific to disabled elite sport contexts and coaches working in them.

We acknowledge the fact that our findings are dependent on us as persons and another research group might have taken a different viewpoint during the design, data collection and analysis process. The first author gained experience in wheelchair sport during her university degree in physical education and biology. She has worked in the field of doping for two years, whereas the other authors have over ten respectively almost 15 years of experience conducting anti-doping research with athletes and coaches in able-bodied elite sport. Furthermore, they have been involved in the implementation of doping controls at major sport events, as well as the design and delivery of anti-doping education programmes. This gave the second and third author a wide insight into the affected stakeholders and the anti-doping systems; yet, they did not have prior experience in disabled sport contexts.

**3. Findings**

This research aimed to explore coaches’ doping-related perceptions and knowledge in Paralympic sport, as well as their opinion of the current anti-doping system. The main findings can be summarized within four themes: (1) Diverse cross-country perceptions of prevalence and ways of doping in Paralympic sport, (2) “the more the incentives grow the more athletes might start looking for the edge”, (3) differences in culture and imbalances in anti-doping efforts across countries influence doping risk, and (4) coaches consider anti-doping important, but see others as responsible.

*3.1. Diverse cross-country perceptions of prevalence and ways of doping in Paralympic sport*

All interviewed coaches perceived that doping occurs in Paralympic sport. Yet, descriptions of the issue differed across countries. The UK coaches were more open and direct, like Jamie (UK) who said that *“there is doping taking place in Paralympic sport”* or Taylor (UK) who stated that *“there’s a lot of knowledge of it in terms of experiences of para athletes doping”*, so it happens for *“sure”* (Kelly, UK). Moreover, many coaches stated, *“it’s an ongoing issue and it’s not gonna be solved soon”* (Joey, UK). Jamie (UK) summarized:

*It is more prevalent than the layperson would expect. I think the general population would assume that the amount of doping taking place in Paralympic sport is significantly less than it might be in Olympic able-bodied sport. My perception is that it’s probably closer to being similar.*

In contrast, German (GER) coaches were more cautious/discreet and protective in the way they spoke about doping in disabled elite contexts. For example, Luca (GER) stated that he can imagine *“missteps”* of Paralympic athletes because they might not be knowledgeable*.* He connected these ‘missteps’ to contaminated supplements. Another coach suggested those could also be due to products unrelated to sport, such as *“hair restorer”* (Eddy, GER). When asked how they know about doping in Paralympic sport, the German-speaking coaches revealed that it is sometimes only a *“suspicion”*, which is gained during a *“bar conversation or during dinner”* (Alex, GER). Illustrating the caution that most German coaches exhibited, Billie (GER) said that he would *“lie”* to say that his sport is *“completely clean … but to generalize it … that is very difficult”*.

Although coaches of each country had slightly different perceptions around doping in general, they were all aware of doping in Paralympic sport and gave similar explanations as to how disabled elite athletes commit doping. While it is not officially ‘doping’ (because it is not an anti-doping rule violation according to the World Anti-Doping Code), coaches of both Germany and the UK mainly raised the issue of classification cheating; what Lou (GER) characterized as *“doping of disabled sport”*. Charlie (UK) perceived classification manipulation as a *“bigger issue than doping”* andAlex (GER) suggested that *“ten to twenty percent”* of athletes are incorrectly classified. He went on to explain that athletes can demonstrate their *“impairment a little worse than it is”* (Alex, GER)and Jamie (UK) proposed that athletes *“become very competitive in another class”* to favour their *“performance capability”*. Kelly (UK) reflected on this, stating *“when the athlete starts to compete and you kind of go, hang on a second, there is a large difference between this athlete and the other athlete in the division”*. Summarizing, Jamie (UK) stated:

*That temptation is there in the same ways it is taking performance enhancing substances, because the opportunity to be successful, to earn money, to make a life of an elite sport is there to be hard…there is risk there within classification.*

Alongside classification manipulation, some coaches see *“massive potential”* to gain a *“competitive advantage”* through *“techno doping”* due to material improvement. Luca (GER) suggested that techno doping is mainly prevalent for *“sitting”* athletes using a wheelchair of *“industrially strong nations”*. Another way to ‘cheat’ was seen in medication, like *“analgesics”* which play *“an important role”* (Lou, GER) in Paralympic sport. Due to their impairments, disabled elite athletes need medication, but likewise it is possible to *“push the boundaries of what’s appropriate”* (Jamie, UK). One coach acknowledged that it is a *“difficult balancing act”* to establish what is really necessary and what is being taken beyond this (Alex, GER). The next theme will provide more detailed insight into reasons for doping in disabled elite sport.

*3.2. “The more the incentives grow, the more athletes might start looking for the edge”*

When asked to describe the main reasons for doping, nearly all coaches emphasized the role which money and financial incentives play as potential risk factors in Paralympic sport. Kelly (UK) illustrated:

*Ultimately, it’s, you know, money is the great corrupter and all that. But as soon as the rewards go up, because the stakes are getting higher, therefore, the pressure to compete goes up…The more the incentives grow, the more I think athletes might start looking for the edge … that could drive athletes to stepping over the line, yeah.*

One coach stated that *“if you win a Paralympic gold medal, you[‘re] gonna win a life changing amount of money”* (Billie, GER). Providing the example of Russia, Kyle (GER) suggested that winning a Paralympic gold medal could mean *“100.000€ or a pension for life”.* However, Joey (UK) emphasised that the risk related to money is not standard, because *“every country has their own sort of reward system”*. Indeed, coaches suggested that in some nations the *“temptation”* to dope might be higher than in others because money is seen as *an “opportunity in life”,* because there is often some kind of *“social recognition”* and enhancement to the athlete’s *“lifestyle”*.Joey (UK) proposed that this means *“winning is addictive”*, athletes *“wanna win”* and would do *“anything to win”*, because *“winning becomes a habit”.* Taylor (UK) described this as a *“main factor for athletes to dope”*. Furthermore, Alex (GER) explained: *“The more professional it (Paralympics) gets, the more likely it is that you will leave all your ethical and moral principles behind, because you want to, or have to, or would like to, earn money.”* Potential motivations might be *“financial protection of the future”* (Lou, GER), to *“help with looking after your family”* (Joey, UK) or the involved *“prestige [and] sponsorship deals”* (Jamie, UK). Taylor (UK) underlined:

*Sport is a big money area, big money game and therefore the more you win, the more money you get … I think the more money that’s in a sport often gives more sway on athletes to give in [to] doping … As much as there is money and pressure within it, whether that’s personal or external, there’s always going to be someone who leaks through the net and dopes.*

Several coaches discussed that the need to win and earn money can result in *“pressure”* on athletes, sporting clubs and/or sport federations. When medals are attached to *“funding in the next (Paralympic) cycle”*, then it leads to *“lots of pressure in the system, [where] it’s all about money”* (Charlie, UK).

Although coaches strongly felt that money – and pressure to win to earn money – was the main influencing factor for doping in disabled elite sport, they also commented that doping can have a reciprocal, negative effect on an athlete’s potential to earn money. They explained that if you ban doped athletes for life, you would *“reduce the amount of impact for the sport”.* This is because *“no one watches”* anymore, the *“sponsors drop out”,* and the sport loses a lot of *“money”* (Kelly, UK). Kelly (UK) went on to explain the paradoxical nature of doping in relation to money, *“it’s that balance between doing what’s right and doing what keeps the income alive to keep the sport alive”*. Continuing to connect athlete’s decisions to dope to structural and cultural factors, Alex (GER) perceived doping as a *“highly political”* issue as the single nations have the power to make *“decisions where, how, when”* and not WADA.

One central point why financial incentives and a winning climate are major factors for doping incidents is that *“the profile of Paralympic sport has risen so much”*. Although participants suggested the Paralympic Games are behind the Olympics Games, Charlie (UK) knows, the *“gap is closing”* in recent years. Like Charlie, most UK coaches, described that the Paralympics are on a *“high level now … are becoming more professional … [and the athletes] are becoming like celebrities”*. Joey (UK) told us that *“20 years ago”,* it was a *“part-time training programme”,* but now athletes are *“full-time”,* because it is their *“job” and “that’s the norm now.”* Yet, one of our German coaches, Alex, provided insights that contradicted this notion; he stated that *“99% (of his athletes) [are] not professional athletes”* whereas in the same sport discipline*, the “national team of the UK … gets paid … [and they have] very professional training circumstances”*. The following theme will go more into depth about perceived differences across nations with regard to culture and anti-doping efforts.

*3.3. Differences in culture and imbalances in anti-doping efforts across countries influence doping risk*

In addition to money driving doping behaviour, coaches proposed that doping is driven by *“cultural and ideologist differences”* between countries. This view was particularly strong among coaches from the UK. Joey (UK) said that *“it [doping] could come from a culture of the sport, culture of the organisation, culture of the country …[and] it could become the norm … because you just think it’s normal to do that (doping)”*. Kelly (UK) suggested *“the stakes drive what the environment [and] culture look like”* and explained that *“it’s about being visible … on a political, governance level”.* Taylor’s (UK) insights supported this suggestion, as he commented *“[it’s] only all about power … and they will do anything to get that gold medal around an athlete’s neck”*. He, and several other coaches – from both the UK and Germany – proposed that some countries (e.g., Russia or China) are *“notorious and known well for doping across the board”*.

When discussing cross-country influences on doping risk, coaches described several differences in (inter)national anti-doping systems. Several coaches suggested that it is difficult when the systems of the national anti-doping organisations (NADOs) abroad *“do not work”* and *“play fast and loose”* (Luca, GER), so that dopers are *“always one step ahead of WADA”* (Kyle, GER). This was one of the main issues that coaches brought to our attention related to testing. Many German and UK coaches claimed that their athletes get *“tested very much”*. Yet, the amount of testing is *“not 100%”* the same within the *“180 nations, who start in the Paralympic field”* (Billie, GER). Jamie (UK) agreed that “*the level of testing each country experiences is asymmetric. It’s not the same.”*,suggesting that this is due to accessibility of athletes. He indicated that “*it is difficult to find athletes in Iran, Iraq, Syria, Egypt, Nigeria and test them. … It’s far easier to test athletes from Western European nations, America, Australia.”*

There was general criticism of testing in disabled elite sport contexts, such as Lou (GER) proposing that there are *“worldwide, far too few doping controls”*. Kelly (UK) corroborating the idea that the *“amount of doping control is not that high”.* Coaches perceived that testing is not being undertaken *“as rigorously as it could be”* because *“it’s been quite rare”* at big events and athletes are not *“getting randomly tested out of competition”*. Furthermore, two coaches suggested that *“successful”* athletes, whose *“media profile is higher”*, are tested much more than less successful or young athletes. Drawing out potential differences across nations once more, Taylor (UK) commented that athletes in some countries are tested *“so sporadic that someone could reasonably dope”*. To improve these shortfalls concerning testing, coaches thought it would be *“brilliant”* to have more random out of competition tests including blood tests, so that the athletes *“feel that the threat [of being caught] is real”* (Kelly, UK). Joey (UK) agreed that there was a need to test athletes “*any day, any time, … because otherwise the athletes know you’re coming”.*

This would mean more *“close meshed, regular, [and] intensive”* doping controls (Kyle, GER) to create the same *“international standard … with the same frequency (of doping test) to be comparable worldwide”* (Luca, GER). Jamie (UK) said, *“we want the rest of the world to be elevated to the same level”*. But at the same time, Eddy (GER) wished to have an *“individual assessment”* of all sport disciplines, because he thinks that there are *“too many”* doping tests in his sport relative to the *“tendency to dope”*. He is aware of the *“masses of money”* that are spent on the *“anti-doping fight”*, but sometimes he would like to use the money for his training to improve it. Many other coaches - across both countries - also acknowledged the huge amount of money needed. They wished to increase the budget for testing, for example, through *“support of the state”* (Lou, GER). In addition, WADA, as a *“neutral body”*, should be internationally regarded as the organisation that determines *“who, when and how”* testing will be conducted (Alex, GER). The result would be *“less influence”* of the nations and *“more power for WADA”*. This would include the wish of *“stricter penalty”* (Kelly, UK), because if someone doped intentionally, *“what’s the point of sport? What’s the point in [the] Paralympics if athletes [have] been allowed to compete again?”* (Joey, UK).

Next to testing, nearly all coaches identified education as a third area of disparity across countries. Jamie (UK) explained:

*We get a lot of education domestically. I’m not sure about if that’s the same in countries where the resources are far less. … When we’re in competitive environments around the world, you don’t get the same impression from other nations. … I think there are asymmetries across the world in terms of resource, in terms of education. … There’s a lot more to be done.*

Charlie (UK) reinforced this notion, as he said he cannot imagine that certain countries (like *“Malaysia or Nepal”)* have the same *“strict”* anti-doping education and *“quality”* that he receives in the UK, *“that’s for sure”*. Luca (GER) and Kelly (UK) also shared doubts about the current education system, stating that anti-doping education is *“right”* and should be *“reinforced”*, but they are both not sure how *“practical”* it is and what *“impact”* it really has. When asked how the situation surrounding education could be improved, Jamie (UK) answered that it would need *“two things … more money and the right plan … [because] if you educate, but don’t test, you can’t prove that the education is effective”*. In addition to this, a number of coaches suggested that engaging broader populations in education would enhance anti-doping efforts. Kelly (UK) would *“love to see the education programme expanded earlier into the pathway”*. Taylor (UK) explained that this could help to create a *“good ethical grounding”* and show at an early stage of an athlete’s career the *“implications of doping”* to the people. Charlie (UK) also said he would *“go further down the pathway”* and educate on a *“home nation level”* and *“club level”.* Furthermore, he would educate stakeholder groups beyond the athlete, such as coachesand parents.

Overall, because coaches perceived their national anti-doping system as *“really good”*, they suggested to *“throw* [that system] *out at the rest of the world“* (Charlie, UK). They perceived that this action would create *“equal opportunities”* (Luca, GER) and *“standardisation”* (Charlie, UK)*.* The coaches called for a system that has an *“international general validity”* (Luca, GER) and *“worldwide … equality”* (Lou, GER). In particular, they signalled the need for *“consistency of application of the rules and consistency of sanctions”* (Kelly, UK). Jamie (UK) summarized the coaches’ desire for consistency as follows:

*You’d standardise national anti-doping agencies, you’d select the ones that are operating at the highest level at the moment, you’d replicate that in every single country. As a result, you’d increase education, you’d increase monitoring in terms of whereabouts systems, you’d increase out of competition testing … the first step is to try and bring portions of the world up to a level of understanding and infrastructure that enables them to create a deterrent.*

*3.4. Coaches consider anti-doping important, but see others as responsible.*

Most coaches - especially the German-speaking coaches - underlined their attitude against doping. For example, Lou (GER) thinks that *“everyone is clean and decent”*, Billy (GER) believed in *“fair play”* and *“clean sport”,* and Alex (GER) perceived doping as *“reprehensible and unfair and harmful”*. Furthermore, nearly all coaches – regardless of their context – claimed that there is no *“high affinity”* to dope or that doping would be *“useless”* in the sport discipline they coach, because their athletes are *“ethically sound”*. Yet, there was recognition that not all coaches hold an anti-doping stance. Joey (UK) said, *“I can imagine a little bit of influence, influence of manipulation from very obsessive coaches, who also wanna win.”* He connected the potential negative (pro-doping) influence of some coaches to the main risk factors that have already been discussed in this paper – winning (and the benefits that come from this):

*I’ve always said, coaches are just as competitive as athletes, because we’re in this business to win. We’re not in this business to come last, you know. We wanna try and be the best we can … So, you could possibly see coaches stepping over the athletes and I’m not saying forcing but being quite forceful with athletes which would be borderline bullying.*

Interestingly, Joey (UK) suggested that it is not only coaches who might pressure athletes to dope. He identified a number of other athlete support personnel as responsible for the (toxic) influence of the environment in which athletes are embedded, *“you could potentially see sport science staff, coaches working with doctors to find ways for the athletes who dope without being identified.”* Charlie (UK) believed that *“in some sport probably the parents are the main influences”*.

Although coaches were not specifically asked about their own role in doping prevention, most participants discussed who is responsible if doping occurs – and, coaches are divided. Half of the coaches thought that they should be *“aware of what they do”*, give *“good advice”* (Kelly, UK), and if they recognize something *“then they should be also be responsible to say so”* (Joey, UK). On the other hand, coaches stated that athletes are *“autonomous”* and *“decide on their own”*. This means that *“at the core”* it’s a *“personal decision”* (Taylor, UK) and it’s *“athlete’s responsibility 100%”* (Kelly, UK). Supporting this idea, Jamie (UK) stated: *“My first priority is to coach the athletes”*. Regardless of perceived responsibility, and country, another point of consensus was that most coaches described themselves as being well educated and knowledgeable about anti-doping. As they attend *“necessary workshops and educational requirements”* (Jamie, UK), it would be no “*issue to know more”* about it (Joey, UK). They have a *“very good standard”* (Kyle, GER), especially with their *“connection”* to well-working NADOs in their countries and the possibility to “fall back” on them (Billie, GER).

Beyond their own role in anti-doping, coaches emphasized that *“there is also responsibility of the sport to have support for athletes”* (Joey, UK) and prevent doping. Most of the interviewed coaches *“trust”* their NADO or *“hope”* that they are *“doing as much as they can”* (Kelly, UK) and therefore *“fulfil their responsibility”* for clean sport (Taylor, UK). When asked why they think so, Luca (GER) and others said that their athletes get *“tested regularly”* and they receive *“specific education annually”* (Jamie, UK). In Germany as well as in the UK, anti-doping efforts were described as *“very professional”*, *“very strict”* and as embedded in a *“stringent system”*. Indeed, coaches stated it is *“such a good system”* (Charlie, UK) with a *“modern, dynamic and contemporary appearance”* (Billie, GER). The UK coaches emphasized their *“good ethical standpoint”* (Taylor, UK) and the many *“different processes that safeguard them (athletes) and demonstrate good practice”* (Jamie, UK). Kelly (UK) could not imagine that *“an athlete in the UK will be able to claim they were unaware of the system and the protocols”*. The message would be *“if you’re gonna dope, you’re gonna get caught, we’re gonna deal with you”* (Charlie, UK). In Germany, coaches described the *“control mechanisms”* as *“very effective”* (Kyle, GER) and the system as a whole as *“very restrictive”*. Consolidating the coaches’ confidence in their NADO’s efforts, Eddy (GER) said that it is *“bloody difficult to dope”* in Germany with the existing *“framework”* where the athletes get tested all the time.

**4. Discussion**

The purpose of this research was to explore doping-related perceptions and knowledge of coaches’ working in disabled elite sport. We also investigated coaches’ opinion of the current anti-doping system to tailor future interventions to this context. This research is the second part of a larger research study. It reports insights from an independent coach sample (i.e., the coaches in this study had no connection to the interviewed athletes in the first part of the project (Weber et al., 2022)). Addressing the issue of doping from both the coach and athlete perspective enabled the authors to compare the current findings with those capturing the views of disabled elite athletes (Weber et al., 2022).

The thematic analysis revealed that coaches perceive doping as an existing and ongoing issue in Paralympic sport. Coaches signalled that there are multiple, intertwined risk factors for disabled elite athletes to dope. However, money and the resulting pressure to win for money were deemed the most significant influences. These factors might partly be related to asymmetric and rare testing in combination with a lack of anti-doping education; issues which the coaches suggested stem from, and represent, imbalanced anti-doping systems across nations. Relatedly, coaches discussed that risk is greatest among athletes of nations with poor infrastructure and limited resources (including low budgets). To improve the perceived issues abroad, the interviewees recommended standardization of the anti-doping system worldwide, by replicating the approach of their countries in every other country. In this vein, coaches reported that in their home countries anti-doping education works well, and doping control tests are implemented properly. Notably, and perhaps because they perceived their NADO’s work favourably, coaches described their NADOs as the lead for anti-doping prevention. They emphasized their own role was to coach their athletes, rather than being responsible for anti-doping issues.

 When talking about coaches’ responsibility towards doping issues, most coaches either refer to the athletes themselves or their ‘well-working’ NADOs. The circumstance, that the interviewed coaches attribute a lot of responsibility explicitly to their NADO as an external organisation, constitutes a new aspect. Prior to our research, coaches primarily named other athlete support personnel, like a team doctor (e.g., Allen et al., 2017; Engelberg & Moston, 2016; Morgan & Smith, 2018; Patterson & Backhouse, 2018). An additional explanation for coaches’ low interest in undertaking anti-doping responsibilities could be related to the finding that coaches perceive the sport they coach as clean (i.e., doping is not seen as a problem) and, therefore, there is no need to engage in doping prevention. This notion is reported in previous research with coaches (e.g., Allen et al., 2017; Mazanov et al., 2015; Morgan & Smith, 2018; Patterson & Backhouse, 2018). However, going beyond what was previously known, coaches not seeing themselves playing a dominant role in doping prevention might stem from their perception that money has a bigger impact on athletes’ doping behaviour than they would/could have. This is a unique finding as this notion is contrary to the fact that coaches influence their athletes, as supported by previous research (e.g., Allen et al., 2017; Engelberg & Moston, 2016). Based on our findings, coaches should be made more aware of their responsibility according the latest WADC (World Anti-Doping Agency, 2021a). This could be achieved through education that helps coaches to understand, for example, the Code. This document assigns coaches specific obligations to fulfil in order to protect their athletes (and that if they compromise anti-doping rules they can be sanctioned and/or lose their accreditation/job). Additionally, as our interviewed coaches do not think they have much influence, it is important to help coaches to recognise that many athletes are influenced by what coaches say and do (Engelberg & Moston, 2016; Kirby et al., 2011; Patterson & Backhouse, 2018). Such education could draw on recent coach-specific interventions (e.g., CoachMADE programme) that have been effective in aiding coaches to develop need-supportive communication styles when approaching doping-related topics (Ntoumanis et al., 2018). Previous research shows that it might be necessary to make coaches attending an annual doping-related educational programme mandatory, e.g., engagement with education is a requirement of a coaching license or accreditation (Engelberg et al., 2017; Patterson et al., 2019). Given that many coaches are volunteers (North et al., 2020), the education programme could be financed by either the anti-doping federation of the respective country or even by the IPC itself, as it is the umbrella organisation of Paralympic sport. It could even go this far, that coaches have to sign an annual declaration to have fulfilled their obligations according the WADC.

Although coaches distance themselves from being responsible for a doping incident, almost all coaches perceived that doping is an existent, well-known issue in disabled elite sport. This finding corroborates the athlete perspective captured by previous research in disabled elite sport (e.g., Collier, 2008; Van de Vliet, 2012; Weber et al., 2022). It also aligns with WADA’s annual reports of detected ADRVs in sports which are overseen by the IPC (World Anti-Doping Agency, 2015, 2016, 2017, 2018, 2019, 2020a). Coming down to the question, which variables might explain doping in disabled elite sport, coaches often emphasized ‘huge’ imbalances in the anti-doping prevention work of NADOs. Even though coaches repeatedly stated that the anti-doping education and testing works well in their countries, they highlighted asymmetries across other nations. They specifically suggested there are insufficient doping tests worldwide. Furthermore, they described some nations as not testing out of competition as often as they could, which results in perceived ‘sporadic’ testing and inconsistency. This aligns with athlete-based research in both disabled (Weber et al., 2022) and able-bodied elite sport (e.g., Allen et al., 2017). In the current study, additional insights have been gained, whereby coaches named potential reasons, which include the difficulty to find, access and test disabled elite athletes everywhere across the world and budget problems to finance enough tests. Diving deeper into the matter of costs for doping tests, WADA spends per year about 228 million USD for 270,000 doping controls (Maennig, 2014). The fact that testing is expensive might contribute to lower rates of testing in poorer countries as anti-doping might not, or even cannot, be prioritized due to scarce financial resources. Yet, the problem of low resources does not only affect testing, but also negatively impacts the implementation of anti-doping education; this finding is shared by Patterson et al. (2016).

To overcome ‘asymmetries’ in the system, coaches in our study called for a standardization of one anti-doping system worldwide that allows global ‘consistency’ and ‘equality’ – though, they did not directly suggest a solution to achieve this and solve the existing financial issues that some nations face. WADA puts a lot of effort into ‘harmonising’ anti-doping efforts – they introduced the Code and International Standards for this exact purpose. WADA also directly supports national anti-doping organisations through initiatives such as the Code Implementation Support Program (CISP; World Anti-Doping Agency, 2020b) and the Global Learning and Development Framework (GLDF; World Anti-Doping Agency, 2021c) to ensure that all countries, independent of their financial resources, have the chance to fulfil their expectations. Despite these efforts, WADA has existed for only 22 years, and, therefore, it is likely unrealistic to expect that all countries are already elevated to one standard. Importantly, there is an ongoing discussion regarding if a ‘one size fits all’ approach is working/appropriate. This is particularly relevant to anti-doping education, which should be individually adapted to a nation’s culture to honour cultural differences (Blank, 2017; Copeland & Potwarka, 2016; Stewart & Smith, 2008). Therefore, the coaches’ desire for ‘equality’ might be the better focus over their desire for ‘consistency’. This would recognise that some countries need to improve and do more than they are, but we would not expect all countries to do *exactly* the same. Bringing it back to what the coaches in our study recommended, one thing that coaches suggested most countries could do better is introducing anti-doping education for both athletes and their support personnel ‘further down the pathway’ (e.g., Pöppel, 2021). At a young age, no matter in which country/culture, attitudes are formed (Backhouse et al., 2012) and adolescents are open and sensitive to (normative) influences (Ntoumanis et al., 2014). Therefore, at the very least, athletes and support personnel would (hopefully) become knowledgeable about their rights and obligations ahead of when they move on to compete at higher competition levels. Additionally, if values based and skills-building education approaches are adopted, young athletes may learn to deal with pressure situations within their training environment (e.g., competitiveness of peers) (Gatterer et al., 2020). Within this approach, it might help coaches in creating environments that reduce the likelihood of athletes seeking out doping experiences.

Next to created environments that do not place excessive pressure on athletes, it is pivotal to enable athletes to cope with pressure. Our interviewed coaches described the intertwined main risk factors of money, pressure, and a habit of winning. According to coaches, disabled elite athletes face both internal (i.e., want to win, social recognition) and external pressure (i.e., maintain sponsorship deals). This finding is congruent with research with disabled elite athletes (Weber et al., 2022) which found that the main risk factors for doping were described in the same complex way – where athletes perceived that doping is driven by a need to win and that winning is connected to money. Athletes also agreed that pressure is tied to winning and money via the fulfilment of expectations like maintaining sponsorship deals and/or satisfying an influencing coach. This ‘theme’ of winning, pressure and money was addressed by disabled elite athletes (Weber et al., 2022) as well as coaches in this paper; therefore, these factors seem to be a significant issue that need to be taken seriously and should be addressed further. The main way to mitigate the central problem of monetary needs is to provide more financial security to athletes. Firstly, prize money could be distributed more evenly. It was shown in a simulation study in able-bodied elite sport that this measure reduces the prevalence to dope up to 40% (Westmattelmann et al., 2020). Secondly, more money could be invested into elite disabled sport. To illustrate, the German State directly supported 959 Olympic and Paralympic athletes with a bonus of 3.5 million euros in 2018. For 2019, the total subsidy amount was raised to 7 million euros (Stifung Deutsche Sporthilfe, 2018). Thirdly, athletes could receive some of the benefits that ‘normal’ employed persons experience, such as maternity pay and sick leave. In this vein, we are also starting to see promising changes, such as the sport sponsor Nike revising its pregnancy policy in 2019 to pay female athletes during maternity leave. Lastly, responsible sports organisations could support a dual career of their athletes to serve as *“financial safety net”* (Defruyt et al., 2020, p. 9). Notably, Erickson et al. (2015) summarized that dual careers can be protective against doping specifically. These structural and policy changes can take long periods of time to achieve and overcoming cultural components that make doping seem ‘normal’ will be challenging. Therefore, bringing it back to the participants in our study, and a level where progress could likely be made more readily, Knight et al. (2018) found that athletes need support of influential others in their sport context to manage their dual careers. This notion is corroborated by Storm et al. (2021) who labelled coaches as a *“key social agent”* (p.11) and support provider for dual careers. Therefore, coaches should be educated on how they could help their athletes to detach from a monetary dependency through their sporting career and following reduce the pressure experienced by their athletes.

*4.1. Limitations*

In the context of anti-doping research, a commonly identified limitation is the phenomena of social desirability. This means that coaches might have answered what they believed was a more socially accepted way instead of stating what they really believe and/or know. To avoid engineered answers, we assured our participants that all data will be anonymised and therefore traceability is reduced to a minimum. A second limitation related to the conduct of the interviews is that one interview was conducted via phone due to a weak internet connection. The fact that we could not react to visual cues in one interview might have biased the interview itself as well as our data. Furthermore, this conversation was the shortest we experienced (23 minutes), so we were initially concerned that perhaps we had not gleaned as many insights as in other interviews. However, we reflected on this as a team and concluded that we had the chance to ask all interview questions and received rich answers. We concluded that this individual was very concise in their answers, as well as being very clear on their opinions on the topic. Therefore, we have perceived no loss of any data compared to other interviews. The third limitation of the interviews relates to the interviewer (the first author). As she is not a native speaker of English, it might be possible that the language barrier influenced the way English-speaking interviewees interpreted the question and phrased their answers. Also, she could not react and rephrase questions as easily as in her mother tongue. To address this circumstance proactively, the first author encouraged the interviewees to indicate if/when anything was unclear for them. As this never/rarely happened, we believe that this did not affect the interviews in their quality and that all participants felt comfortable within the interview situation.

 More generally, the chosen sample could be seen as a limitation regarding generalizability. Following the thoughts of Smith (2018), we rejected a *“statistical-probabilistic”* (p.138) view and want to emphasize the in-depth insights of our findings, capturing coaches’ perspectives in the context of disabled elite sport. To enable *naturalistic generalizability*, we invite readers to consider if our findings resonate with their own experiences. For instance, we ask readers to reflect on if they have been in similar situations to those we describe in our findings and/or if they can see similarities/differences between their perception and our findings (Smith, 2018). Our meaningful quotes and derived interpretations are meant to be challenged in terms of *transferability* to other settings and situations, in regard to if they sound familiar and reasonable (Smith, 2018). This is especially important and vital, as we recruited a gender imbalanced sample of ten male coaches and only one female participant due to the fact that men are more often top-level coaches compared to women (Knoppers et al. 2021). However, with this procedure, we hope to provoke resonance within other contexts (e.g., countries, sport disciplines), although we sampled and analysed eleven elite coaches from two European countries.

In the future, we encourage researchers to engage with a greater diversity of individuals, including seeking increased representation from female coaches and interacting with coaches (and athletes) from more nations, who may face very different individual and structural conditions than those whom we have spoken with so far. In addition, we suggest engagement with coaches (and athletes) who have direct experience of doping. Our study has begun to uncover how and why doping may occur in elite disabled sport. However, hearing from individuals with direct experience of doping may enable a deeper understanding of substances (e.g., medications) and methods (e.g., boosting, techno-doping) used, and this would undoubtedly enhance effective preventive efforts. Within such investigations, we urge researchers to consider the heterogeneity of impairment and specific requirements of sporting practices, as very different forms of doping might arise dependent on individuals’ circumstances. In a similar vein, it is clear that issues are being caused by the way heterogeneously impaired bodies are being organised into ‘classes’ for sporting competition. It was not our intention to explore classification manipulation in our project, but coaches (and athletes, in our previous sample; Weber et al., 2022) consistently raised this issue in our conversations. While classification manipulation is not doping (according to WADA’s definition), individuals in the elite disabled sport community evidently perceive it as a significant threat to the integrity of sport – and possibly the welfare of athletes. Therefore, dedicated research is required to fully understand how and why classification manipulation occurs to inform developments to the system (be it the classes themselves, the process of classification, and/or the introduction of education/support for athletes and support personnel surrounding both).

Lastly, we did not adopt a specific theory *a priori* to understand doping behaviour in Paralympic sport. As this is the first study to investigate the views of coaches working in disabled elite sport, we were open-minded and very broad in the areas explored. As far as we know, there is no existing theory that captures the range of issues we were investigating, as we studied coaches’ perception, their knowledge concerning doping in disabled elite sport, and their opinions of the anti-doping system. We recommend that future studies build on our findings by narrowing the focus to one of these areas. For example, if researchers choose to focus on reasons for doping, they could investigate if a broader range of factors are present (as our study was dominated by discussions of winning and money). Some researchers may determine that a theoretical framework would enhance their investigations in providing an opportunity to establish a wider range of influential factors. If this is the case, we suggest adopting the socio-ecological model (Stewart & Smith, 2008) because both our coach and athlete studies revealed that there are risk factors operating at several levels (intrapersonal, interpersonal and structural); more specific details of how the socio-ecological modal can aid our understanding of doping in disabled elite sport is provided in Weber et al. (2022).

**5. Conclusion**

To the best of our knowledge, this is the first research exploring coaches’ doping-related perceptions and knowledge in disabled elite sport, as well as their opinion of the current anti-doping system. Overall, the thematic analysis revealed that doping is perceived as an existing and ongoing issue in Paralympic sport due to its constant growth including professionalism of the sport, enhanced commercialization, and media coverage. Therefore, greater attention being paid to this context by researchers and practitioners is warranted. In future anti-doping efforts, considerations should be given to the key risk factors of professionalism, money, and pressure to win, which are knitted together and increase the likelihood to dope. According to coaches, these factors are influenced by imbalanced anti-doping prevention leading to asymmetric/rare testing and a lack of anti-doping education. This perception is especially strongly articulated for nations with low infrastructure, low resources, and low budget. Taken together, this study highlighted many different issues in the context of doping in disabled elite sport and demand for improvement. This means to strengthen education for coaches on how to help athletes and/or to remind them of their obligation according to the WADC to protect their athletes. In terms of financial security, dual career support for athletes should be reinforced and likewise policies/sport systems need to adapt to the challenges athletes face (e.g., job security). To research more in-depth, allow specific analysis and honour the single issues to tailor interventions to them, future qualitative as well as quantitative research is required in more countries across the world to illuminate more details about doping in disabled elite sport. As a starting point, a special focus could be on the identified key risk factors of professionalism, financial incentives/money and pressure to win.

**Conflicts of Interest**

None.

**Funding**

This research is funded by the Austrian Science Fund (FWF) (P 31864-B).

**Acknowledgements**

We thank all interviewed coaches for their time and their trust to share with us their experiences and perceptions in Paralympic sport. This is much appreciated and will contribute to establish further research in this field.

**References**

Allen, J. B., Morris, R., Dimeo, P., & Robinson, L. (2017). Precipitating or prohibiting factor: Coaches’ perceptions of their role and actions in anti-doping. *International Journal of Sports Science & Coaching*, *12*(5), 577–587.

Allen, J. B., Taylor, J., Dimeo, P., Dixon, S., & Robinson, L. (2014). Predicting elite Scottish athletes’ attitudes towards doping: Examining the contribution of achievement goals and motivational climate. *Journal of Sports Sciences*, *33*, 1–8. https://doi.org/10.1080/02640414.2014.976588

Backhouse, S. H., Patterson, L., & McKenna, J. (2012). Achieving the Olympic ideal: Preventing doping in sport. *Performance Enhancement & Health*, *1*(2), 83–85. https://doi.org/10.1016/j.peh.2012.08.001

Bhambhani, Y., Mactavish, J., Warren, S., Thompson, W. R., Webborn, A., Bressan, E., De Mello, M. T., Tweedy, S., Malone, L., & Frojd, K. (2010). Boosting in athletes with high-level spinal cord injury: Knowledge, incidence and attitudes of athletes in paralympic sport. *Disability and Rehabilitation*, *32*(26), 2172–2190.

Blank, C. (2017). *A road to a new perspective in doping prevention – One size does NOT fit all*. https://ph.au.dk/en/research/research-units/sport-and-body-culture/research-unit-for-sport-and-body-culture/international-network-of-doping-research/newsletters/december-2017/indr-commentary-cornelia-blank/

Blank, C., Leichtfried, V., Fürhapter, C., Müller, D., & Schobersberger, W. (2014a). Doping in Sports: West-Austrian Sport Teachers’ and Coaches’ Knowledge, Attitude and Behavior. *German Journal of Sports Medicine/Deutsche Zeitschrift Fur Sportmedizin*, *65*(10).

Blank, C., Leichtfried, V., Fürhapter, C., Müller, D., & Schobersberger, W. (2014b). Doping in Sports: West-Austrian Sport Teachers’ and Coaches’ Knowledge, Attitude and Behavior. *Deutsche Zeitschrift Für Sportmedizin*, *2014*(10), 289–293. https://doi.org/10.5960/dzsm.2014.133

Boardley, I. D., Grix, J., Ntoumanis, N., & Smith, A. L. (2019). A qualitative investigation of coaches’ doping confrontation efficacy beliefs. *Psychology of Sport and Exercise*, *45*, 101576. https://doi.org/10.1016/j.psychsport.2019.101576

Braun, V., & Clarke, V. (2006). Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77–101.

Braun, V., & Clarke, V. (2013). *Successful qualitative research: A practical guide for beginners*. sage.

Braun, V., & Clarke, V. (2019a). Reflecting on reflexive thematic analysis. *Qualitative Research in Sport, Exercise and Health*, *11*(4), 589–597.

Braun, V., & Clarke, V. (2019b). To saturate or not to saturate? Questioning data saturation as a useful concept for thematic analysis and sample-size rationales. *Qualitative Research in Sport, Exercise and Health*, 1–16.

Castleberry, A., & Nolen, A. (2018). Thematic analysis of qualitative research data: Is it as easy as it sounds? *Currents in Pharmacy Teaching and Learning*, *10*(6), 807–815.

Chan, D. K. C., Tang, T. C. W., Yung, P.-H., Gucciardi, D. F., & Hagger, M. (2019). Is unintentional doping real, or just an excuse?. *British Journal of Sports Medicine, 53*(15), 978-979. doi:10.1136/bjsports-2017-097614

Collier, R. (2008). Most Paralympians inspire, but others cheat. *CMAJ*, *179*(6), 524–524. https://doi.org/10.1503/cmaj.081279

Copeland, R., & Potwarka, L. R. (2016). Individual and contextual factors in ethical decision making: A case study of the most significant doping scandal in Canadian university sports history. *Sport Management Review*, *19*(1), 61–68.

Defruyt, S., Wylleman, P., Kegelaers, J., & Brandt, K. D. (2020). Factors influencing Flemish elite athletes’ decision to initiate a dual career path at higher education. *Sport in Society*, *23*(4), 660–677. https://doi.org/10.1080/17430437.2019.1669324

Engelberg, T., & Moston, S. (2016a). Inside the locker room: A qualitative study of coaches’ anti-doping knowledge, beliefs and attitudes. *Sport in Society*, *19*(7), 942–956.

Engelberg, T., & Moston, S. (2016b). Inside the locker room: A qualitative study of coaches’ anti-doping knowledge, beliefs and attitudes. *Sport in Society*, *19*(7), 942–956. https://doi.org/10.1080/17430437.2015.1096244

Engelberg, T., Moston, S., & Blank, C. (2017). Coaches’ Awareness of Doping Practices and Knowledge about Anti-Doping Control Systems in Elite Sport. *Drugs Education Prevention & Policy*, *accepted*. https://doi.org/10.1080/09687637.2017.1337724

Erickson, K., McKenna, J., & Backhouse, S. H. (2015). A qualitative analysis of the factors that protect athletes against doping in sport. *Psychology of Sport and Exercise*, *16*, 149–155.

Fagher, K., Forsberg, A., Jacobsson, J., Timpka, T., Dahlström, Ö., & Lexell, J. (2016). Paralympic athletes’ perceptions of their experiences of sports-related injuries, risk factors and preventive possibilities. *European Journal of Sport Science*, *16*(8), 1240–1249. https://doi.org/10.1080/17461391.2016.1192689

Gatterer, K., Gumpenberger, M., Overbye, M., Streicher, B., Schobersberger, W., & Blank, C. (2020). An evaluation of prevention initiatives by 53 national anti-doping organizations: Achievements and limitations. *Journal of Sport and Health Science*, *9*(3), 228–239.

Gatterer, K., Niedermeier, M., Streicher, B., Kopp, M., Schobersberger, W., & Blank, C. (2019). An alternative approach to understanding doping behavior: A pilot study applying the Q-method to doping research. *Performance Enhancement & Health*, *6*(3), 139–147. https://doi.org/10.1016/j.peh.2018.12.001

Guba, E. G., & Lincoln, Y. S. (1994). Competing paradigms in qualitative research. *Handbook of Qualitative Research*, *2*(163–194), 105.

Jefferies, P., Gallagher, P., & Dunne, S. (2012). The Paralympic athlete: A systematic review of the psychosocial literature. *Prosthetics and Orthotics International*, *36*(3), 278–289. https://doi.org/10.1177/0309364612450184

Kirby, K., Moran, A., & Guerin, S. (2011). A qualitative analysis of the experiences of elite athletes who have admitted to doping for performance enhancement. *International Journal of Sport Policy and Politics*, *3*(2), 205–224.

Knight, C. J., Harwood, C. G., & Sellars, P. A. (2018). Supporting adolescent athletes’ dual careers: The role of an athlete’s social support network. *Psychology of Sport and Exercise*, *38*, 137–147.

Knoppers, A., de Haan, D., Norman, L., & LaVoi, N. (2021). Elite women coaches negotiating and resisting power in football. Gender, Work & Organization.

Lentillon-Kaestner, V., & Carstairs, C. (2010). Doping use among young elite cyclists: A qualitative psychosociological approach. *Scandinavian Journal of Medicine & Science in Sports*, *20*(2), 336–345.

Madigan, D. J., Stoeber, J., & Passfield, L. (2016). Perfectionism and attitudes towards doping in junior athletes. *Journal of Sports Sciences*, *34*(8), 700–706. https://doi.org/10.1080/02640414.2015.1068441

Maennig, W. (2014). Inefficiency of the Anti-Doping System: Cost Reduction Proposals. *Substance Use & Misuse*, *49*, 1201–1205. https://doi.org/10.3109/10826084.2014.912065

Martin, E. M., Ewing, M. E., & Gould, D. (2014). Social Agents’ Influence on Self-Perceived Good and Bad Behavior of American Youth Involved in Sport: Developmental Level, Gender, and Competitive Level Effects. *The Sport Psychologist*, *28*(2), 111–123. https://doi.org/10.1123/tsp.2013-0005

Mauerberg-deCastro, E., Campbell, D. F., & Tavares, C. P. (2016). The global reality of the Paralympic Movement: Challenges and opportunities in disability sports. *Motriz: Revista de Educação Física*, *22*, 111-123.

Mazanov, J., Hemphill, D., Connor, J., Quirk, F., & Backhouse, S. H. (2015). Australian athlete support personnel lived experience of anti-doping. *Sport Management Review*, *18*(2), 218–230. https://doi.org/10.1016/j.smr.2014.05.007

McLaren, R. H. (2016). The independent person 2nd report. *World Anti-Doping Agency, Montréal*.

Morgan, S. A., & Smith, J. (2018). Perceptions of Anti-Doping Policy among Collegiate Coaches. *Applied Research in Coaching & Athletics Annual*, *33*, 106–129.

North, J., Piggott, D., Rankin-Wright, A., & Ashford, M. (2020). An empirical examination of UK coaches’ issues and problems, and their support and advice networks. *International Sport Coaching Journal*, *7*(3), 283-294.

Ntoumanis, N., Ng, J. Y. Y., Barkoukis, V., & Backhouse, S. (2014). Personal and Psychosocial Predictors of Doping Use in Physical Activity Settings: A Meta-Analysis. *Sports Medicine*, *44*. https://doi.org/10.1007/s40279-014-0240-4

Ntoumanis, N., Gucciardi, D. F., Backhouse, S. H., Barkoukis, V., Quested, E., Patterson, L., ... & Kaffe, S. (2018). An intervention to optimize coach motivational climates and reduce athlete willingness to DOPE (CoachMADE): protocol for a cross-cultural cluster randomized control trial. *Frontiers in psychology*, *8*, 2301.

Ommundsen, Y., Roberts, G. C., Lemyre, P.-N., & Miller, B. W. (2006). Parental and Coach Support or Pressure on Psychosocial Outcomes of Pediatric Athletes in Soccer. *Clinical Journal of Sport Medicine*, *16*(6), 522–526. https://doi.org/10.1097/01.jsm.0000248845.39498.56

Patterson, L. B., & Backhouse, S. H. (2018). “An important cog in the wheel”, but not the driver: Coaches’ perceptions of their role in doping prevention. *Psychology of Sport and Exercise*, *37*, 117–127.

Patterson, L. B., Backhouse, S. H., & Duffy, P. J. (2016). Anti-doping education for coaches: Qualitative insights from national and international sporting and anti-doping organisations. *Sport Management Review*, *19*(1), 35–47. https://doi.org/10.1016/j.smr.2015.12.002

Patterson, L. B., Backhouse, S. H., & Lara-Bercial, S. (2019). Examining Coaches’ Experiences and Opinions of Anti-Doping Education. *International Sport Coaching Journal*, *6*(2), 145–159. https://doi.org/10.1123/iscj.2018-0008

Pöppel, K. (2021). Efficient Ways to Combat Doping in a Sports Education Context!? A Systematic Review on Doping Prevention Measures Focusing on Young Age Groups. *Frontiers in Sports and Active Living*, *3*, 368. https://doi.org/10.3389/fspor.2021.673452

QRS International. (2019). *Available from: Https://Www.Qsrinternational.Com/Nvivo-Qualitative-Data-Analysis-Software/Home (Accessed 06 June 2020)*.

Rodek, J., Sekulic, D., & Kondric, M. (2012). Dietary supplementation and doping-related factors in high-level sailing. *Journal of the International Society of Sports Nutrition*, *9*(1), 51. https://doi.org/10.1186/1550-2783-9-51

Smith, B. (2018). Generalizability in qualitative research: Misunderstandings, opportunities and recommendations for the sport and exercise sciences. *Qualitative Research in Sport, Exercise and Health*, *10*(1), 137–149.

Smith, B., & McGannon, K. R. (2018). Developing rigor in qualitative research: Problems and opportunities within sport and exercise psychology. *International Review of Sport and Exercise Psychology*, *11*(1), 101–121. https://doi.org/10.1080/1750984X.2017.1317357

Smith, B., & Sparkes, A. C. (2016). Qualitative interviewing in the sport and exercise sciences. *Routledge Handbook of Qualitative Research in Sport and Exercise*, 103–123.

Sparkes, A. C., & Brighton, J. (2020). Autonomic dysreflexia and boosting in disability sport: exploring the subjective meanings, management strategies, moral justifications, and perceptions of risk among male, spinal cord injured, wheelchair athletes. *Qualitative Research in Sport, Exercise and Health*, *12*(3), 414-430.

Sparkes, A. C., & Smith, B. (2013). *Qualitative research methods in sport, exercise and health: From process to product*. Routledge.

Sparkes, A. C., & Smith, B. (2014). *Qualitative research methods in sport, exercise and health: From process to product*. Routledge/Taylor & Francis Group.

Stewart, B., & Smith, A. C. (2008). Drug use in sport: Implications for public policy. *Journal of Sport and Social Issues*, *32*(3), 278–298.

Stifung Deutsche Sporthilfe. (2018, December 13). *Unterstützung für Sporthilfe-Athleten signifikant ausgebaut: Rund 3.650 Euro Kaderprämie 2018*. Stiftung Deutsche Sporthilfe. https://www.sporthilfe.de/ueber-uns/medien/pressemitteilungen/unterstuetzung-fuer-sporthilfe-athleten-signifikant-ausgebaut-rund-3650-euro-kaderpraemie-2018

Storm, L. K., Henriksen, K., Stambulova, N. B., Cartigny, E., Ryba, T. V., De Brandt, K., Ramis, Y., & Erpič, S. C. (2021). Ten essential features of European dual career development environments: A multiple case study. *Psychology of Sport and Exercise*, *54*, 101918.

Thevis, M., Hemmersbach, P., Geyer, H., & Schänzer, W. (2009). Doping im Behindertensport. *Medizinische Klinik*, *104*(12), 918. https://doi.org/10.1007/s00063-009-1190-8

Ungerleider, S. (2001). Faust’s Gold: Inside the German Doping Machine. *New York: Dunne*.

Van de Vliet, P. (2012). Antidoping in Paralympic Sport. *Clinical Journal of Sport Medicine : Official Journal of the Canadian Academy of Sport Medicine*, *22*, 21–25. https://doi.org/10.1097/JSM.0b013e31824206af

Weber, K., Patterson, L. B., & Blank, C. (2022). An exploration of doping-related perceptions and knowledge of disabled elite athletes in the UK and Austria. *Psychology of Sport and Exercise*, *58*(58). https://doi.org/10.1016/j.psychsport.2021.102061

Westmattelmann, D., Sprenger, M., Hokamp, S., & Schewe, G. (2020). Money matters: The impact of prize money on doping behaviour. *Sport Management Review*, *23*(4), 688–703.

World Anti-Doping Agency. (2015). *2013 Anti-Doping Rule Violations (ADRVs) Report*. https://www.wada-ama.org/sites/default/files/resources/files/wada-2013-adrv-report-en.pdf

World Anti-Doping Agency. (2016). *2014 Anti-Doping Rule Violations (ADRVs) Report*. https://www.wada-ama.org/sites/default/files/resources/files/wada-2014-adrv-report-en\_0.pdf

World Anti-Doping Agency. (2017). *2015 Anti-Doping Rule Violations (ADRVs) Report*. https://www.wada-ama.org/sites/default/files/resources/files/2015\_adrvs\_report\_web\_release\_0.pdf

World Anti-Doping Agency. (2018). *2016 Anti-Doping Rule Violations (ADRVs) Report*. https://www.wada-ama.org/sites/default/files/resources/files/2016\_adrvs\_report\_web\_release\_april\_2018\_0.pdf

World Anti-Doping Agency. (2019). *2017 Anti-Doping Rule Violations (ADRVs) Report*. https://www.wada-ama.org/sites/default/files/resources/files/2017\_adrv\_report.pdf

World Anti-Doping Agency. (2020a). *2018 Anti-Doping Rule Violations (ADRVs) Report*. https://www.wada-ama.org/sites/default/files/resources/files/2018\_adrv\_report.pdf

World Anti-Doping Agency. (2020b, May 6). *2021 Code Implementation Support Program*. World Anti-Doping Agency. https://www.wada-ama.org/en/what-we-do/education-prevention/2021-code-implementation-support-program

World Anti-Doping Agency. (2021a). World Anti-Doping Code 2021. *Montreal, Canada: World Anti-Doping Agency*. https://www.wada-ama.org/sites/default/files/resources/files/2021\_wada\_code.pdf

World Anti-Doping Agency. (2021b, August 3). *Global Learning and Development Framework—Backgrounder*. World Anti-Doping Agency. https://www.wada-ama.org/en/resources/governance/global-learning-and-development-framework-backgrounder