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SHOULD I REPORT ABUSE? - ATTITUDES TOWARD DOPING TESTING AND ANONYMOUS REPORTING IN THE WHISTLEBOWER PROGRAMME

ALI NAJ PRIJAVIM ZLORABO? – STALIŠČA DO DOPINŠKIH TESTIRANJ IN ANONIMNE PRIJAVE V PROGRAMU ŽVIŽGAVKA

ABSTRACT

Despite all endeavours to prevent it, the use of performance-enhancing substances continues to occur in sports and social science research suggests that doping prevalence is likely much higher than what is found through testing. One of the ways to uncover doping violators is through reporting illicit drug use, through "doping whistleblowing" – the readiness to do so depends highly on the level of our moral development and the motivation to do so. It was exactly this method, which helped uncover some of the biggest doping scandals in sport in the past few years and our purpose in this study was to examine attitudes toward drug testing and anonymous reporting and see, if we can predict an athlete's intention to report anonymously based on attitudes toward drug testing. 255 top athletes and coaches from Estonia and Slovenia-two small, athletically successful countries-participated in this study, 176 male and 79 female, 156 athletes and 99 coaches from team and individual sports. They filled out an attitudes questionnaire about drug testing and an anonymous report. The participants filled out a questionnaire online. We used t – test to compare subgroups of participants and correlation and linear regression to look for relations between doping attitudes and willingness to make an anonymous report. Comparisons of subgroups of participants revealed that female participants are more likely to believe that taking banned substances should be punished but are less likely to make an anonymous report. We also found that coaches seem to be better informed about the issue of doping than athletes and trust NADO more than athletes. We found several correlations between attitudes toward doping testing and those toward anonymous report and we tried to predict the willingness to make an anonymous report. We found several predictors, which were different for men and women. NADOs play an important role in creating conditions, which will enable people to report doping anonymously, but it has to be done both through education and through rigorous testing. This will ensure that whistleblowing can become an active part of the fight for clean sport.

Keywords: doping attitudes, anonymous report, doping abuse, moral development

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IZVLEČEK

Ne glede na ves trud za preprečevanje zlorabe, je uporaba substanc, ki bi lahko izboljševale izvedbo, v športu prisotna, družboslovne raziskave kažejo, da je te zlorabe še precej več, kot jih odkrijejo s testiranji. Eden od načinov za odkrivanje dopinga je uporaba tako imenovanih »dopinških žvižgačev«, pripravljenost za prijavo zlorabe pa je odvisna od motivacije in stopnje našega moralnega razvoja. Prav s pomočjo žvižgačev so namreč v preteklih letih odkrili nekaj največjih dopinških škandalov. Namen naše raziskave je bil preveriti stališča do dopinških testiranj in anonimne prijave in ugotoviti, ali lahko na podlagi teh stališč napovemo pripravljenost narediti anonimno prijavo o kršitvi. V raziskavi je sodelovali 255 vrhunskih športnikov in trenerjev iz Estonije in Slovenije, dveh majhnih, a športno uspešnih držav. Od tega jih je bilo 176 moških in 79 žensk in 156 športnikov in 99 trenerjev, tako iz ekipnih kot individualnih športov. Izpolnili so vprašalnik o dopinških testiranjih in anonimni prijavi, reševanje je potekalo preko spleta. S t-testom smo primerjali podskupine udeležencev, s korelacijo in linearno regresijo pa smo preverjali odnose med stališči do dopinških testiranj in pripravljenostjo narediti anonimno prijavo. Ugotovili smo, da so ženske bolj prepričane, da bi morali jemanje prepovedanih substanc kaznovati, so pa manj naklonjene temu, da bi same prijavile kršitev preko anonimne prijave. Ugotovili smo tudi, da imajo trenerji mnenje, da so bolj ozaveščeni o dopingu kot športniki in v primerjavi s športniki bolj zaupajo nacionalnim protidopinškim agencijam. Našli smo tudi več povezav med stališči in pripravljenostjo narediti anonimno prijavo in poskušali smo predvideti, na podlagi česa bo pripravljenost za anonimno prijavo večja. Ti prediktorji so bili drugačni za moške kot ženske. Nacionalne protidopinške agencije imajo ključno vlogo pri omogočanju anonimnih prijav, pri tem pa morajo delovati tako na področju izobraževanja in rednih testiranj – tako lahko zagotovijo, da bodo lahko žvižgači postali aktivni del boja za čist šport.

Ključne besede: stališča do dopinga, anonimna prijava, doping, moralni razvoj

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INTRODUCTION

Anti-doping policies were developed to protect the right of athletes to train and compete in a doping-free environment, and testing is an important tool to secure this right. Although the rules are enacted and enforced regardless of athletes' perceptions of the effort, anti-doping authorities rely on the support and trust of athletes to effectively prevent doping in elite sport and to legitimise the rather extensive anti-doping programme (*World Anti-Doping Code*, 2015). In securing the athletes' right to doping-free sport, doping controls are an important measure (Overbye, 2016).

Doping controls (tests) are conducted to obtain analytical evidence of an athlete's compliance (or non-compliance) with the Code's strict prohibition on the presence/use of a prohibited substance or prohibited method. "Any Athlete may be required to provide a Sample at any time and in any location by an Anti-Doping Organisation with testing authority" (*World Anti-Doping Code*, 2015, pp. https://www.wada-ama.org/en/athletes-support-personnel/anti-doping-process).

Despite scientific advances that make it possible to detect increasingly refined substances and ongoing efforts to strengthen doping controls, the use of performance-enhancing substances (PES) continues to occur in sports. While the proportion of anti-doping rule violations detected by doping controls is less than 2% (WADA, 2016), social science research suggests that doping prevalence is likely much higher (Whitaker et al., 2014). Some studies suggest prevalence rates as high as 35% and question the effectiveness of current doping control systems.

The number of tests at the global level increased significantly until the early 2010s, when optimization through intelligent (evidence-based) testing was recommended (*World Anti-Doping Code*, 2015). Annually, about 280 thousand tests (both urine and blood tests) are performed worldwide, but the percentage of positive cases is not increasing and each year less than 2% of doping tests performed show a positive test result.

Recent studies (Overbye, 2016)suggest that current policies have led to a different kind of inconsistency and new forms of inequality for athletes. Different countries have somewhat different standards and athletes can be treated diffenerently, as different countries implement the code differently, including international standards for doping control and testing – they are not the same in all countries (Overbye, 2016). Wagner and Hanstad (2011) have shown, that national implementation of the Code takes different forms.

Overbye (2016) studied, how elite athletes perceive and trust the functioning of the doping control system in their sport. She found that about one-third of athletes disagree to some extent that the number of tests and the selection of athletes for doping control are appropriate. She found that athletes, who rely on the testing system being effective and working well worldwide show greater distrust or dissatisfaction with the current testing system. The different views of the athletes show that the current anti-doping policy is simultaneously met with sport, (dis)trust and frustration (Overbye, 2016). By including the views and experiences of top Danish athletes, this study confirmed that the current testing system faces obstacles and contributed to the knowledge of some of the challenges WADA faces in implementing the policy.

About 90% of all athletes (Tavani et al., 2012) believed that anti-doping testing should be conducted regularly by sports federations, during training and not only during competitions. 72% felt that only a small proportion of athletes who engage in illegal doping practises are detected during anti-doping controls. Researchers (Dunn et al., 2010)also found that the majority of their participants believed that testing for banned substances is an effective way to deter people from using them.

On the other hand, athletes often have negative attitudes toward testing (Judge et al., 2010) about two-thirds of their participants did not believe that testing protocols were fair. More than half of the athletes believed that drug testing is the most effective way to prevent the use of performance-enhancing drugs in sports, but a large majority agreed that drug testing does not catch all athletes who cheat. From this study, we can also see that participants do not believe that drug testing is an invasion of privacy and accept drug testing as part of participation.

Athletes believe (Ćorluka et al., 2011; Rodek et al., 2012) that first offenders should receive a lenient sentence and second offenders should receive a life sentence. Almost half of the participating Croatian athletes (Šajber et al., 2013)believe that a financial penalty is the correct sanction for doping offenders, while one-third of the participants would opt for a life ban and one-fourth for an initially lenient, then life ban. Similarly, Iranian athletes were found to be against the free use of all drugs (Halabachi et al., 2011) and strongly believe in doping controls, the same result was found among Iranian coaches (Seif Barghi et al., 2015). Studies uniformly confirm that the majority of athletes oppose doping and support doping controls - both in terms of attitude and behavioural intention (Judge et al., 2010).

How willing we are to report doping abuse also depends on our level of moral development. Kohlberg defined three stages of moral orientation, each consisting of two stages (Papalia et

al., 2003) - this is a theory related to Piaget's theory of cognitive development, as it uses a person's thinking to determine the level of moral development (Zupančič, 1990). Kohlberg (Kohlberg, 1984) describes three stages of moral development-the pre-conventional, conventional, and post-conventional stages, where a person's sense of morality is defined in terms of more abstract principles and values. Although we would expect people who are at this highest stage to be most ready to "blow the whistle" (Kohlberg, 1984), this stage is rarely reached. Moral development is a difficult construct to measure because what we are willing to say and what we do can differ considerably (Bucik, 1997).

Cognitive theories of moral development understand moral maturity as understanding the society in which we live-the more complex the society, the more complex one's morality must be in order for the person to successfully adapt to it (Marjanovič Umek & Zupančič, 2004). Since doping abuse is a complex issue, the athlete's morality should be at the highest possible level in order to respect the rules and regulations and truly understand the importance of doping to the sport and to each individual athlete.

Moral development, according to Kohlberg, depends on the level of cognitive development, but also on motivation (Thomas, 1992) - a person may be able to act at a higher moral level, but does not show it in a certain environment because it may be "dangerous" for them to do the right thing. It also depends on taking on social roles - a person may take on different roles in different environments, which also means they will make moral decisions at different levels. Finally, moral development also depends on the structure of rights in social groups and institutions - groups that promote decision making and responsibility, where the principles of equality and reciprocity apply, will stimulate moral development far more than rigid groups and institutions based on authority (Kroflič, 1997). This means that we should focus heavily on education and understanding as a means of prevention, rather than punishment, in promoting the moral development of athletes.

Although there are various mechanisms for investigating or detecting illicit drug use in sport, such as oral and written evidence, academic research, and investigative journalism, encouraging individuals to report illicit drug use (in other words, to be a "doping whistleblower") has received increased attention in research (Erickson et al., 2017). Whistleblowers have become increasingly important and impactful in exposing doping in sport. Recent examples include Russian insiders whose allegations led to the country's exclusion from some sports at the 2016

Summer Olympics in Rio de Janeiro and from the entire 2018 Winter Olympics in Pyeongchang.

The increasing prevalence of whistleblowing in sport has led to the need to understand the conditions underlying the intent of whistleblowing. Whistleblowing involves the reporting of an illegal (or unethical) act by an observer who has inside information about the wrongdoing (Goldsmith, 2015). Track and field athletes appeared willing to contribute (Whitaker et al., 2014)to the elimination of doping in athletics by blowing the whistle, while rugby league players revealed a moral dilemma by suggesting that they would all abide by a code of silence and not report a teammate for doping despite disagreeing with the teammate's actions.

Over the past fifteen years, there have been an increasing number of high-profile whistleblowing cases in sports. One of the first cases of whistleblowing in doping was when Trevor Graham, a former track and field coach from the United States, anonymously called the U.S. Anti-Doping Agency and alerted them to undetectable anabolic steroids being distributed to world-class athletes (USADA, 2023). The case, which became known as the BALCO scandal, was at the time the largest doping scandal in the history of athletics, also involving sprinters and baseball stars. Whistleblowing was also a reason for one of the biggest doping scandals in cycling. Landis, a former teammate of Lance Armstrong, blew the whistle on Armstrong after he himself was caught blood doping. The case ended with Armstrong being stripped of his seven Tour de France titles and ordered to pay millions in compensation (The Wall Street Journal, 2015).

The purpose of this study was to examine attitudes toward drug testing and anonymous reporting among male and female athletes, among coaches and athletes, and among athletes in team and individual sports. We will attempt to find a correlation between attitudes toward drug testing and attitudes toward anonymous reporting and attempt to predict intention to report anonymously based on attitudes toward drug testing.

METHODS

Participants

255 top athletes and coaches from Estonia and Slovenia - two small, athletically successful countries -participated in this study (M_{age}= 32.90 ±14.78 years), of whom 176 were men (M_{age}= 34.60 ± 15.43 years) and 79 were women (M_{age}= 29.11 ± 12.49 years); men were older than

women (t =3.01; sig (t)=0.00). 156 of them were athletes (M_{age}= 24.60 ± 9.15 years) and 99 coaches (M_{age}= 45.98 ± 12.28 years), coaches were older than athletes (t =-14.90; sig (t)=0.00). 166 participants in individual sports (M_{age}= 34.14 ± 15.99 years) and 87 participants in team sports (M_{age}= 30.30 ± 11.63 years), participants in individual sports were older (t = 2.26; sig (t)=0.03).

Instruments

Participants were administered an attitudes questionnaire about drug testing (14 questions) and an anonymous report (3 questions), which they answered on a 5-point scale (1 - I strongly disagree, 5 - I strongly agree) (Makuc et al., 2019). The attitudes questionnaire was part of the questionnaire developed by Konrad Kleiner and Lisa Steinmaurer from the Centre for Sport Science and University Sport at the University of Vienna for an international project on doping in sport. The questions on anonymous reporting were also used in this project and were created by Nina Makuc from SLOADO.

Procedure

Participants were contacted by email as part of an international doping project and asked to complete an online questionnaire. Before completing the questionnaire, they all signed an informed consent form to participate in the study, the rules of the Helsinki declaration were fully accounted for. The National Anti-Doping Agency provided the information on actual cases of anonymous reporting. The data were processed using IBM SPSS Statistics 25.0. We used t – test to compare male and female participant, coaches and athletes and athletes of team and individual sports. Homogeneity of variance was tested with Levene's test for equality of differences, when differences were significant on the level of 0.05, we used a rectified value of t. Pearson correlation was used for checking the correlations, and linear regression to look for relations between doping attitudes and willingness to make an anonymous report. The used level of significance was 0.05.

RESULTS

Table 1. Significant differences in attitudes toward doping control and anonymous reporting between male and female participants, athletes and coaches, and individual and team athletes.

	males		females					95% CI for Cohen's d	
	M	*SD*	*M*	*SD*	*t*	*sig (t)*	*Cohen's d*	*Lower*	*Upper*
the use of banned substances should be punished	3.91	1.06	4.19	0.86	-2.03	0.04	0.23	0.01	0.46
readiness to make an anonymous report if someone was using doping	3.88	1.24	3.53	1.3	2.05	0.04	0.40	0.15	0.66
	athletes		coaches					95% CI for Cohen's d	
	M	*SD*	*M*	*SD*	*t*	*sig (t)*	*Cohen's d*	*Lower*	*Upper*
awareness of possible report of mistakes during doping control procedure	3.48	1.3	3.98	1.24	-3.05	0.00	-0.26	-0.48	-0.05
punishments for doping violations should be more severe	3.67	1.14	4.19	1.11	-3.58	0.00	-0.52	-0.72	-0.32
NADO is a trustworthy organization	3.61	1.11	4.04	1.03	-3.16	0.00	-0.07	-0.12	-0.02
our country has stricter rules regarding doping than other countries	2.08	1.02	1.77	1.07	2.37	0.02	0.32	0.11	0.53
doping controls are a necessary part of elite sport	4.45	0.84	4.72	0.64	-2.89	0.00	-0.31	-0.50	-0.12
knowledge how to make an anonymous report	3.15	1.4	3.55	1.38	-2.19	0.03	-0.34	-0.58	-0.10
anonymous report is a tool to fight for clean sport	3.79	1.09	4.11	1.13	-2.27	0.02	-0.36	-0.60	-0.12
	individual sports		team sports					95% CI for Cohen's d	
	M	*SD*	*M*	*SD*	*t*	*sig (t)*	*Cohen's d*	*Lower*	*Upper*
doping controls are an interference in my life	2.08	1.17	1.74	0.98	2.38	0.02	0.11	-0.13	0.36

In Table 1, we can see that several differences were found between the subgroups of our participants. Female participants are more likely to believe that taking banned substances should be punished but are less likely to make an anonymous report if they know that someone is violating the doping rules. Several differences were also found between coaches and athletes - coaches seem to be better informed about the issue of doping than athletes - they are more aware that they can report possible errors during the testing process and know better how to make an anonymous report, also they are more likely than athletes to believe that anonymous reporting is useful in the fight for clean sport. They also believe more than the athletes that the

NADO is trustworthy, are more likely to believe that the penalties for doping rule violations should be harsher and believe that doping controls are a necessary part of elite sport, while the athletes in both participating countries believe more than the coaches that their countries have stricter anti-doping rules than other countries and that this puts them at a disadvantage.

Table 2. Correlations between attitudes to doping testing and readiness to make an anonymous report.

	knowledge how to make an anonymous report	anonymous report is a tool to fight for clean sport	readiness to make an anonymous report if someone was using doping
awareness of possible report of mistakes during doping control procedure	0.40		
NADO's work is highly proficient	0.32		
punishments for doping violations should be more severe		0.32	0.31
NADO is a trustworthy organization	0.43	0.30	

Note: Only significant correlations, higher than 0,30 are shown in the table.

Table 2 shows that knowledge of how to make an anonymous report correlates with awareness that reporting errors in the doping control process is possible and the trustworthiness and competence of the NADO. The belief that an anonymous report is a means to fight for a clean sport correlates with the belief that the punishments for doping offenders are too lenient and with the trustworthiness of the NADO, while the willingness to make an anonymous report correlates with the belief that the punishments for doping offenders should be harsher.

Table 3. Linear regression for readiness to make an anonymous report in male and female participants separately.

		B	Beta	t	sig (t)
men	Constant	0.32		0.45	0.65
	adult athletes should decide on their own regarding doping, external control is redundant	-0.19	-0.22	-2.81	0.01
	our country has stricter rules regarding doping than other countries	0.25	0.22	2.69	0.01
	doping control helps protect clean athletes	0.35	0.31	3.68	0.00
women	Constant	1.11		0.79	0.43
	understanding the procedure before being tested for the first time	0.35	0.39	2.87	0.01
	punishments for doping violations should be more severe	0.27	0.24	1.96	0.05
	doping controls are a necessary part of elite sport	-0.56	-0.30	-1.98	0.05

We ran a regression of attitudes toward doping control on willingness to make an anonymous report when someone uses doping separately for men and women, because we found in Table 1 that men were more willing to make this report. Thus we decided to run a separate regression model for male and female participants. The dependent variable was willingness to make an anonymous report, the predictors were attitudes to doping testing. We found both models were found to be significant (men: R =0.51, R2=0.26; F = 4.05; sig (F) = 0.00; women: R =0.57, R2=0.33; F = 2.25; sig (F) = 0.01). Men are most likely to make an anonymous report if they believe athletes should not make their own decisions about doping, if they believe their country applies doping rules very strictly, and if they believe doping controls help protect clean athletes. Our female participants are most likely to make an anonymous report if they are well acquainted with the testing process, if they believe that penalties for doping violations should be harsher, and if they believe that doping controls are a necessary part of elite sport.

DISCUSSION

Our review of attitudes toward drug testing and willingness to report anonymously confirms some findings of previous studies and sheds new light on this issue. Studies uniformly confirm that athletes believe in strict punishments for doping offenders (Ćorluka et al., 2011; Rodek et al., 2012), but differences between male and female athletes are rarely examined. Our results show that female participants feel more strongly than our male participants that the use of banned substances should be punished, but that they are less willing to report the abuse of banned substances, even through an anonymous channel. This means that men are more forthcoming when it comes to doping rule violations but would act more quickly if they found out someone was doping - so our male participants seem more willing to act.

When looking at differences between coaches and athletes, we found several differences. The coaches in our study show greater knowledge of the rules for doping controls compared to the athletes - for example, they know that you can make a report if you think there has been a mistake during the testing process, they also know how to make an anonymous report, and they see this tool as a useful way to keep doping out of sport. When asked how trustworthy the NADO is, the coaches indicate a more positive attitude than the athletes. Coaches' opinion on doping also seems to be stricter - they say that doping violations should be punished severely, while athletes have a less strict attitude towards it (however, on a 5-point scale, both coaches and athletes score an average of more than 3, which means that they neither agree nor disagree

with the statement). Previous studies have shown that coaches are strongly against doping (Seif Barghi et al., 2015).

Coaches in our study are also more likely than athletes to believe that doping controls should be part of elite sport-so our findings are consistent with those of researchers (Judge et al., 2010) who found negative attitudes toward doping controls among athletes, although this study lacks data from coaches to make a good comparison. It was interesting to find that athletes in both participating countries were more likely than coaches to think that their countries had stricter anti-doping rules than other countries and that this put them at a disadvantage - athletes are likely to be more sensitive when it comes to doping because they are the ones primarily exposed to doping controls and these affect their daily lives much more than coaches'. In the past, national implementation of the code has been found to take different forms (Wagner & Hanstad, 2011). Since athletes share information and frequently communicate with their counterparts from other countries, it is understandable that they have a less positive attitude towards doping controls if they feel that they are treated more strictly than athletes from other countries.

We also compared athletes from team and individual sports and found that athletes from individual sports view doping controls as a greater intrusion into their lives than athletes from team sports - it would be interesting to see if this is just an attitude or reality. That there are differences in perceptions of doping offences and views on doping controls in team and individual sports was also confirmed in interviews, where others noted that track and field athletes seemed willing to report doping, while rugby league players would refrain from reporting a teammate for doping - even though they disagree with the teammate's actions (Whitaker et al., 2014).

Next, we wanted to look for correlations between attitudes toward doping control and views on anonymous reporting and found that people who know more about how doping control is conducted (e.g., that they know they can report irregularities during the control process) and who believe that their NADO is trustworthy and does its job well, i.e., who believe in the NADO's competence, also have more knowledge about how to make an anonymous report. We can assume that people who already know a lot about doping and trust NADO would also be more likely to visit their website, follow their posts, and follow them on social media and thus learn about the whistleblower programme. Following NADO's information and belonging to social groups where knowledge is promoted also promotes moral development (Kroflič, 1997),

and it is easy to understand that people with more knowledge also have more positive attitudes toward the whistleblower programme.

Our results also show that the belief that anonymous reporting is a means to fight for clean sport correlates with the belief that punishments for doping offenders are too lenient and that the NADO is a trustworthy organisation. It is believed that the prevalence of doping is likely much higher (Whitaker et al., 2014) than testing indicates (less than 2% of drug tests performed show positive results). Some studies suggest prevalence rates as high as 35%, calling into question the effectiveness of current doping control systems. Encouraging people to become doping whistleblowers is one of the hopes for the fight for clean sport (Erickson et al., 2017). This is based on the trustworthiness of NADOs and the individual belief of athletes that punishments should be harsher, as well as the belief that testing is not the only solution, as was previously found (Judge et al., 2010). Our results show that willingness to make an anonymous report correlates with the belief that penalties for violations should be harsher. It appears that our participants view anonymous reporting as a tool that can help catch more violators, which would go some way to correcting the fact that violators caught through testing receive a penalty that they view as too lenient. Catching more violators through anonymous reporting could be seen as offsetting lenient penalties.

We also conducted a regression analysis to see what combination of attitudes influences a person's decision to make an anonymous report when they have information about doping abuse. Because we found differences in attitudes toward drug testing between male and female participants, we ran two separate regressions and found that both regression models were significant. We found that men were more likely to report suspected doping abuse if they strongly believed that external doping control was necessary, implying that people should not make their own decisions about doping. External control provides structure, establishes rules, and enables fair play (Kajtna & Jeromen, 2013), i.e., it provides a sense of safety and security, which is a basic human need, and it is understandable that our participants aspire to a sport where the rules are clear. Most athletes believe in the need for drug testing (Dunn et al., 2010; Tavani et al., 2012) - we can speculate that most male athletes are therefore willing to make a report if they suspect it. This conjecture is supported by the other two beliefs that affected men's willingness to make an anonymous report, namely, the belief that their country is very strict about doping rules and the belief that doping controls help protect clean athletes. We have already found that the athletes in our study believe that their countries are very strict about

doping rules, which confirms our conclusion that male athletes will make a report if they suspect abuse.

The regression model for female athletes shows that they are willing to make an anonymous report if they have a good knowledge of the testing procedure, which usually also means that they are aware of and have a great knowledge of the doping rules, and if they believe in stricter penalties for doping violations. Women are also more likely to file a report if they believe that doping controls are a necessary part of sport. This highlights the importance of NADO's educational efforts. The more people know about doping controls, how important they are, and what WADA has accomplished through doping controls, the more likely they are to actively participate in the fight for clean sport. This is important for both men and women, but our research shows that it may be especially important for women. Education contributes to moral development as it depends on cognitive development (Thomas, 1992). Through education, we could help athletes develop a greater awareness of clean sport and get them to join the fight for clean sport. This in turn would contribute to a better sporting environment for all athletes and make elite sport a safer place for all.

CONCLUSION

In our study, we investigated the attitudes of male and female athletes, coaches and athletes, and athletes in team and individual sports toward drug testing and anonymous reporting. We also sought to determine what attitudes increase the likelihood that athletes will make an anonymous report of doping abuse.

We found that female participants felt more strongly than male participants that taking banned substances should be punished, but they were less likely to report banned substance abuse, even through an anonymous channel. The male participants in our study would act more quickly if they found out someone had doped. We also found differences between coaches and athletes. Coaches report knowing more about doping rules and testing procedures, and they also have a more positive attitude toward the NADO and are generally more firmly opposed to doping. Athletes from individual sports view doping controls as an intrusion into their lives, while team athletes are more accepting of them. We also found correlations between attitudes toward doping control and attitudes toward anonymous reporting, and elaborated on this with a regression analysis that found that men are most likely to report suspected doping abuse if they believe doping control is necessary, if they live in a country that strictly enforces WADA rules,

and if they believe doping control helps protect clean athletes. Women, on the other hand, are most likely to report suspected doping rule violations if they are knowledgeable about the testing process, if they believe that penalties for violations should be harsher, and if they believe in the necessity of testing to maintain clean sport. We believe that NADOs play an important role in creating these "conditions," both through education and through rigorous testing that ensures athletes have an environment and knowledge in which they will participate in the fight for clean sport through the whistleblower programme. An education programme needs to be created to support athletes at all levels in their whistleblowing actions to ensure that doping does not occur(Zhang, 2018). The education programme should not only discuss the meaning, mechanisms, responsibilities, and psychological, social, and economic consequences of doping in sport, but also highlight the reporting options available, the potential risks of reporting (e.g., stress, intimidation), and the measures to protect the integrity and identity of whistleblowers.

Ethics approval and consent to participate

The study was conducted according to the guidelines of the Declaration of Helsinki, all participants signed an informed consent form before participating in the study.

Consent to publication

All authors have read the manuscript and agree that it can be submitted for publication in its current form.

Availability of data and material

The data presented in this study are available on request from the corresponding author. The data are not publicly available due to the sensistity of the topic.

Competing interests

The authors declare that they have no competing interests.

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