



Beyond Winning: Examining Sociodemographic and Sport Factors Associated with Doping Attitudes in High-Performance Sport Coaches Involved in Olympic Team Sports

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Abstract

Coaches have a significant impact on the lives and development of athletes, so understanding the factors that influence their doping attitudes (DA) are particularly important. The aim of this study was to investigate sport-specific and sociodemographic correlates of DA among high-level sport coaches involved in Olympic team sports (soccer, basketball, handball, and volleyball). The participants were high-level coaches from Kosovo ($n = 113$, age: 42.99 ± 10.9 years). Previously validated questionnaires were used for testing all participants, asking them about sociodemographic-, sport- factors, doping-related-factors (all predictors), and DA (criterion). Logistic regression for binarized criterion (negative DA vs. neutral/positive DA) was applied to define the associations between the studied predictors and the DA as an outcome. The results revealed a greater likelihood of neutral/positive DA among male coaches (OR = 2.01, 95% CI: 1.11–2.33) and among those coaches who believe that doping is prevalent in their sport (OR = 1.55, 95% CI: 1.25–1.87). No further associations between the studied predictors and DA were found. Additional studies analyzing other samples, sports and variables are warranted.

Keywords: performance enhancement; predictors; sport success; logistic regression; coaching



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Introduction

The use of performance-enhancing drugs and techniques (doping) is recognized as one of the most important problems in sports (Kondric, Sekulic, Uljevic, Gabrilo, & Zvan, 2013; Rodek, Idrizovic, Zenic, Perasovic, & Kondric, 2013), and the

global fight against doping in sports is a concerted effort by various organizations, governments, and athletes (Kondric et al., 2011). This fight is essential to maintain the integrity of sport, protect the health of athletes, and ensure a level playing field for all competitors (Özkan et al., 2020). Despite the overall efforts,

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the problem of antidoping rule violation is still ongoing due to several of the most important challenges.

First, and probably most important, is the constant development of new performance-enhancing drugs and methods, which poses a challenge for anti-doping authorities. Second, athletes and organizations involved in doping constantly employ sophisticated methods to avoid detection, such as microdosing or the use of masking agents. Furthermore, it is clear that anti-doping programs require significant financial resources for testing, research, and education. Finally, some countries and organizations do not fully cooperate with antidoping efforts, hindering the global fight against doping. While testing and sanctions remain crucial deterrents, education is increasingly recognized as a fundamental pillar in the global fight against doping in sports. It aims to foster a culture of clean sport by proactively addressing the root causes of doping, empowering athletes and supporting personnel in making informed, ethical choices (Liposek et al., 2018; Sajber, Maric, Rodek, Sekulic, & Liposek, 2019).

In developing educational anti-doping programs, the correlates of doping attitudes (DA) are specifically targeted (Varfolomeeva, Kozyreva, & Beresneva, 2023). The idea is to target athletes with positive DA, which will allow the development of targeted and precise anti-doping education. For this purpose, numerous studies have examined the different factors associated with DA in sports, including sociodemographic, cultural, sport, and psychological correlates of doping (Versic, Uljevic, & Pelivan, 2022). For this purpose, sociodemographic factors are frequently studied. Specifically, in a study examining the correlates of DA in different types of sports, religiousness was found to be a protective factor against doping in weightlifting, whereas racket sport athletes who observed doping behavior in their sport were more likely to engage in doping themselves (Rodek et al., 2013). Social factors, including the influence of coaches and contact with doping users, also contribute to doping attitudes and behaviors (Zucchetti, Candela, & Villosio, 2015). A review reported that younger age, male gender, and higher levels of competitiveness, and perception of a lenient anti-doping climate are linked to increased likelihood of doping (Ntoumanis, Ng, Barkoukis, & Backhouse, 2014).

It is well known that coaches hold a unique position of influence and trust in the lives of athletes (Liposek et al., 2018). Their role extends far beyond developing athletic skills; they shape attitudes, behaviors, and ultimately, the culture of the sport, making them pivotal figures even in the fight against doping in sports (Liposek et al., 2018; Matosic, Ntoumanis, Boardley, Stenling, & Sedikides, 2016; Nicholls et al., 2020; Sajber, Rodek, Escalante, Olujic, & Sekulic, 2013). There are numerous reasons why coaches should be observed as highly important persons in antidoping efforts. First, coaches are often seen as role models by athletes, especially at younger ages (Sullivan, Paquette, Holt, & Bloom, 2012). Their actions can significantly impact an athlete's perception of fair play and ethical conduct in sports. They create a training environment, which can either foster a culture of clean sport or inadvertently encourage the pursuit of performance at any cost. Also, coaches are responsible for educating athletes about the dangers of doping, the rules, and the available support systems; however, they can help dispel myths and misconceptions and encourage open communication about doping issues. Therefore, identifying the factors associated with attitudes toward doping among coaches, not only athletes, is crucial. However, although a certain number of studies have examined DA in coaches, their knowledge of a problem and their willingness to report doping suspicions, studies have rarely reported correlates of DA in coaches (Backhouse & McKenna, 2012; Whitaker, Backhouse, & Long, 2014).

Therefore, this study aimed to investigate sport-specific and sociodemographic correlates of DA among high-level sport coaches involved in four Olympic team sports (soccer, basketball, handball, and volleyball). We hypothesized that sociodemographic factors would be significantly associated with DA in the studied coaches.

Methods

Participants

The participants in this study were high-level coaches involved in Olympic team sports (handball, volleyball, soccer, basketball) from Kosovo ($n = 113$, age: 42.99 ± 10.9 years). The sample characteristics are presented in Table 1.

Table 1. Characteristics of the study sample (count and percentage in each group)

	Basketball	Handball	Soccer	Volleyball	Total
Females	3 (8%)	5 (21%)	4 (11%)	4 (25%)	16 (14% of all)
Males	33 (92%)	18 (79%)	34 (89%)	12 (75%)	97 (86% of all)
Total	36 (32% of all)	23 (20% of all)	38 (34% of all)	16 (14% of all)	113 (100%)

The participants were invited to participate in the study by their sport federation. At study entry, they were informed that participation was voluntary, that they would remain anonymous, and that no personal details that would allow them to be connected individually with the provided answers would be asked. The study was approved by the ethical committee of the University of Zagreb, Faculty of Kinesiology.

Variables

Previously validated questionnaires were used for testing all participants, asking them about sport factors, sociodemographic factors, and doping-related factors (including DA) (Devic et al., 2018; Sekulic, Bjelanovic, Pehar, Pelivan, & Zenic, 2014; Zenic, Stipic, & Sekulic, 2013).

Sociodemographic questions included questions on age

(in years), gender (male, female), marital status (married/partnership, single), education level (high school, college/university students, college level, university level), and religiousness. The Santa Clara Strength of Religious Faith Questionnaire (SCSRF), a 10-item tool, was used to measure religious intensity and involvement. This questionnaire has been previously validated for use in sports research (Zenic et al 2013.).

The sport factors included questions about the coaches' experience in sports: (i) as athletes and (ii) as coaches (both in years) and their highest competitive achievements as coaches (local competitions, national competitions, international competitions).

Doping-related factors included questions on personal opinion on the main problem of doping in sports (doping is mainly a health hazard, doping is mainly a problem of fair-play, doping is equally a health hazard and a fair-play issue, not

sure), coaches' personal opinions about the presence of doping in their sport (I do not think doping is used, not sure, doping is rare, doping is common), and personal DA (I never suggest the usage of doping, I do not know/not sure, I will suggest the usage of doping if it will help my athletes with no health hazard, I will suggest the use of doping). For the purpose of the later logistic regression calculations (please see Statistics for details), DA was categorized into "Negative DA" (first answer) and "Neutral and positive DA" (remaining answers).

Statistics

Given that most variables were not normally distributed according to the Kolmogorov-Smirnov test, we reported frequencies and percentages for descriptive statistics (with means and standard deviations for normally distributed variables).

To compare genders, we used the Mann-Whitney test for ordinal variables, the chi-square test (χ^2) for nominal variables, and the independent samples t test for normally distributed variables.

To evaluate the associations between sociodemographic

factors, sport factors (predictors), and DA, we employed logistic regression. The DA was binarized into two categories: "Negative DA" (scored as 1) and "Neutral and positive DA" (scored as 2). In the first phase, each predictor was independently correlated with the criterion. In the second phase, we performed multivariate logistic regression, with significant predictors simultaneously included in the regression calculation to control for potential covariates. The results are presented as odds ratios (ORs) and 95% confidence intervals (CIs).

Statistica 13.5 (Tibco, Inc., CA, USA) was used for all calculations, and a p value of 0.05 was applied.

Results

Table 2 presents the gender differences in the study variables. Evidently, male coaches were more involved in sports as athletes/players and as coaches than their female peers were (t test = 2.83 and 2.34, $p < 0.05$, respectively). No significant differences were detected in terms of age (t test = 1.58, $p > 0.05$) or religiousness evaluated by SCSRF (t test = 0.91, $p > 0.05$).

Table 2. Descriptive statistics for normally distributed variables with differences between sexes

	Males (n = 97)		Females (n = 16)		T test		
	Mean	Std.Dev.	Mean	Std.Dev.	t value	df	p
Age (years)	43.65	11.04	39.00	9.81	1.58	111	0.12
Experience as a player (years)	16.91	5.55	12.19	9.28	2.83	111	0.01
Experience as a coach (years)	10.64	5.92	7.00	4.60	2.34	111	0.02
Santa Clara Strength of Religious Faith (score)	36.46	5.55	37.75	2.11	-0.91	111	0.37

Male coaches were more likely to be single (not married) than females were (Chi square = 5.13, $p = 0.05$). No significant gender-differences were detected, and/or null frequencies

did not allow calculation of the χ^2 for the remaining variables (Table 3).

The logistic regression results for the binarized criterion DA

Table 3. Descriptive statistics (F – frequencies; % - percentages) and gender differences for nonparametric variables

	Males		Females		Mann-Whitney/ χ^2 (p)
	F	%	F	%	
Marital status (χ^2)					5.13 (0.02)
Single	86	88.66	11	68.75	
Married/partnership	10	10.31	5	31.25	
Education level (χ^2)					-
High school	17	17.53	0	0	
College/University Student	14	14.43	2	12.50	
College degree	49	50.52	11	68.75	
University degree	17	17.53	3	18.75	
Coaching achievement (Mann-Whitney)					0.67 (0.49)
Local level	51	52.58	10	62.50	
National level	29	29.90	3	18.75	
International level	11	11.34	2	12.50	
Prevalence of doping in (their) sport (χ^2)					-
I do not think doping is used	73	75.26	15	93.75	
Not sure	17	17.53	1	6.25	
Used, but rarely	6	6.19	0	0	
Used, often	1	1.03	0	0	

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Table 3. Descriptive statistics (F – frequencies; % - percentages) and gender differences for nonparametric variables

	Males		Females		Mann–Whitney/ χ^2 (p)
	F	%	F	%	
Doping attitudes (χ^2)					-
I will suggest usage of doping if it will help	8	8.25	0	0	
I will suggest usage if there will be no health hazard	5	5.15	2	12.50	
Not sure	23	23.71	2	12.50	
No, never	61	62.89	12	74.50	
Main problem of doping (χ^2)					1.43 (0.69)
Doping is health hazard	59	60.82	8	50.00	
Fair play issue	20	20.62	3	18.75	
Both health hazard and fair play issue	15	15.46	4	25.00	
Not sure	3	3.09	1	6.25	

(negative DA vs. neutral/positive DA) are presented in Figure 1. Among all the studied variables, two correlations reached statistical significance. Specifically, a greater likelihood of positive DA was found for males (OR = 2.01, 95% CI: 1.11–2.33) and for

those coaches who were of the opinion that their sport is doping contaminated (Figure 1A). When both significant predictors were included in the analysis, male sex was retained as a single significant predictor of DA (OR = 1.68, 95% CI: 1.05–2.01) (Figure 1B).

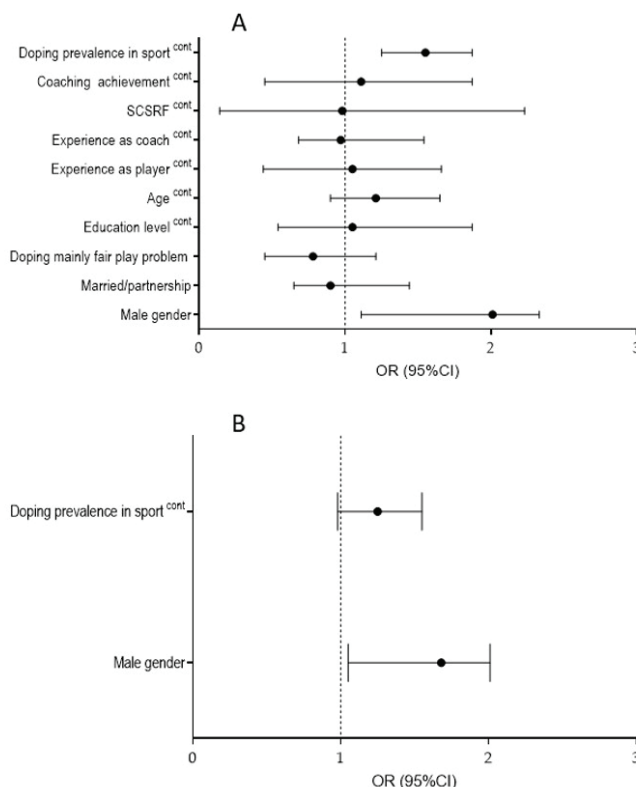


Figure 1. Results of the univariate (Figure 1A) and multivariate (Figure 1B) logistic regressions for the binarized criterion “doping attitudes” with neutral/positive doping attitudes as the reference value (^{cont} indicates variables observed as continuous for the purpose of logistic regression calculation; SCSR – Santa Clara Strength of Religious Faith)

Discussion

There are several important findings of this study. First, there is an influence of gender on DA in coaches, with males being more positively oriented toward doping than their female peers. Second, in addition to gender, sociodemographic

factors were poorly related to DA among coaches. Therefore, our initial study hypothesis could be only partially accepted. Finally, no significant associations between sport factors and DA were established.

Our results revealed a greater likelihood of a neutral/posi-

tive DA among male coaches. We could not find studies where gender differences in DA were established for coaches, but this issue is frequently emphasized in athletes. In most cases, male athletes are more prone to doping than their female peers are (Devic et al., 2018; Kondric et al., 2011). However, the background of these findings in athletes cannot be simply transferred to coaches, since in some cases, the positive DA in athletes is related to physiological factors that could contribute to the “personal usage” of doping among them. For example, “societal pressures” for men to achieve a muscular physique may contribute to the use of performance-enhancing substances, but naturally, this is the case for athletes and not for coaches. Therefore, in explaining the possible background of the greater tendency for positive DA in male coaches, several unique mechanisms and factors should be discussed.

There is no doubt that people who are professionally involved in sports as coaches should be competitive (Popovych, Blynova, Nosov, Zinchenko, & Kononenko, 2021). While both men and women can be highly competitive, societal expectations and norms may place greater pressure on men to win at all costs. Indeed, throughout history and across many cultures, men have often been associated with traits such as strength, competitiveness, and the pursuit of victory (Skillen, 1993). This association has been reinforced through various channels, such as traditional gender roles (men were historically expected to be providers and protectors), sports as a masculine domain (sports have often been viewed as a predominantly male domain), and media representation (i.e., the portrayal of male athletes in the media often focuses on their competitive drive, ambition, and willingness to push boundaries to achieve success). Coaches are not immune to these societal pressures (Kroschus, Garnett, Hawrilenko, Baugh, & Calzo, 2015). Therefore, they may naturally feel pressure to produce winning athletes and therefore feel that their own success and reputation are tied to their athletes’ performance. It could result in pushing athletes to their limits and potentially condone or even encourage doping. Furthermore, by prioritizing winning over everything else, coaches can inadvertently create an environment where athletes feel pressured to use performance-enhancing drugs. Therefore, desire to win can lead some coaches to rationalize or justify unethical practices such as doping, believing it is necessary to level the playing field or achieve success.

However, it is important to emphasize that the gender differences in this context and the greater likelihood of neutral/positive DA in males are probably influenced by a complex interplay of factors rather than a simple gender binary. As stated previously, traditional gender roles and societal expectations often place greater pressure on men to achieve success and demonstrate dominance, sometimes at any cost. However, certain sports may foster a culture that is more accepting of doping practices, particularly those that emphasize power, strength, and aggression (Rodek et al., 2013). If male coaches are disproportionately represented in such sports, this could contribute to the observed difference. Further, it is known that men might be more inclined toward risk-taking behavior than women are (Byrnes, Miller, & Schafer, 1999). This could translate into a greater willingness to engage in or condone doping practices, despite known health and ethical concerns. Finally, and from our perspective, most important is the fact that, in most sporting contexts, power imbalances favor male coaches. This naturally creates a scenario where they feel more entitled to bend or break the rules to achieve desired outcomes.

The sociodemographic factors observed herein have already been studied in relation to DT in athletes. For example, one study indicated that doping experiences outside competitive sports are more prevalent among individuals with lower education levels (Pedersen & Benjaminsen, 2006). Additionally, religiousness was found to be a significant protective factor against doping behavior, such as weightlifting, in highly energetically demanding sports (Rodek et al., 2013). Further, studies have shown an association between paternity and marital status with doping, with a lower tendency toward doping in athletes who are married and have children (Sekulic, Kostic, Rodek, Damjanovic, & Ostojic, 2009). Meanwhile, this is one of the first studies in which sociodemographic factors were specifically studied as correlates of DA in coaches who are engaged in specific groups of sports—team sports. In general, other than gender (please see the previous discussion), no specific associations between the studied sociodemographic indices and DA were observed. The possible reasons are discussed in the following text.

First, the lack of association between sociodemographic factors and DA among the studied coaches could be attributed to differences in the sports coaches involved. Specifically, our participants were coaches involved in four team sports, which are very distinct in regard to doping. Studies conducted thus far have shown clear differences in the DA of athletes involved in Olympic team sports, with athletes involved in handball being the most vulnerable to doping, followed by basketball players and soccer players, whereas the lowest prevalence of positive DA was found among volleyball players (Sekulic et al., 2016). These differences are probably translated even to coaches involved in these sports. Consequently, such differences and “sport influence” could diminish the influence of the studied sociodemographic factors on DA in observed coaches.

Second, the number of males and females involved in some of the studied sports could also contribute to the lack of association between other sociodemographic factors (predictors) and DA in coaches. Specifically, males are more prone to positive DA than their female peers. At the same time, there is a certain discrepancy in the involvement of male and female coaches in the studied sports. The most balanced situation (although males dominate) is in volleyball (please see Table 1), and this sport is known to have a low prevalence of positive DA (Sekulic et al., 2016). This could also result in certain bias in evaluating the correlations between predictors and criteria, simply because of the previously presented differences in DA in athletes.

In regard to religiousness and possible associations with DA among coaches, specifics of the sample of participants and testing should be briefly presented. Because of anonymity, we did not ask coaches about their specific religious affiliation, and the measurement tool we used allowed us to obtain data on the level of their religiousness irrespective of their affiliation (Plante & Boccaccini, 1997). Although some previous studies confirmed certain protective effects of religiosity against DA in athletes, to the best of our knowledge, all studies performed thus far have examined one specific religion (Rodek, Sekulic, & Kondric, 2012; Zenic et al., 2013; Zvan, Zenic, Sekulic, Cubela, & Lesnik, 2017). Finally, there is a certain possibility that different religions are differentially oriented toward doping, which could bias our results, leading to a nonsignificant association between religiousness and DA among the studied coaches.

Sports factors, such as sport experience and sport competitive success, are frequently studied in relation to DA in athletes, and the results of previous studies confirmed dynamic

and relatively sport-specific associations in different sports and cultures. For example, while in some sports, greater competitive success was associated with a (more) positive likelihood of doping, in other sports, athletes who achieved better sport success were negatively oriented toward doping (Kondric, Sekulic, & Mandic, 2010; Kondric et al., 2011; Rodek et al., 2012). Additionally, studies highlighted a greater risk for doping in athletes who achieved better success at the youth level, particularly if they did not achieve sport success at later stages of their career (Sekulic et al., 2014). On the other hand, sport factors were not related to DA in the coaches studied here. Possible explanations are briefly discussed in the following text.

Sports achievement was frequently found to be associated with DA in athletes (please see previously). However, sport achievement in athletes is determined by physical factors (i.e., natural talent and physical attributes), training and conditioning (allows athletes to develop their skills and physical capacities), psychological factors (i.e., motivation and goal settings, mental toughness and resilience), and various environmental factors (i.e., socioeconomics, social support, and cultural determinants) (Tucker & Collins, 2012). Doping is clearly associated with some of these factors, mostly physical ones (Nikolopoulos, Spiliopoulou, & Theocharis, 2011). Therefore, it is logical that doping (as a way of enhancing physical capacity) is associated with sport achievement in athletes, either positively (with a higher likelihood of doping in those who do not possess necessary physical attributes) or negatively (with a lower likelihood of doping in those athletes who are physically “well equipped” for success).

On the other hand, factors that determine sport success in coaches are quite different than those in athletes. Competitive achievement in sport coaches is determined by a multifaceted interplay of factors encompassing personal qualities, professional expertise, and external circumstances (Batista et al., 2019; Côté, 2006; Shanmugam & Jowett, 2016). Coaching expertise and knowledge likely play the most important role, with paramount importance to the deep understanding of the sport’s rules, techniques, tactics, and training methodologies. Furthermore, pedagogical and communication skills are also important, with crucial roles of effective teaching, clear communication, and proper ability to motivate and inspire athletes. Coaches need to lead their teams, create a positive environment, resolve conflicts, and make sound decisions under pressure while being able to adapt their primary coaching styles to different athletes and situations. Collectively, it is clear that doping is not related to any of these attributes that contribute to sport achievement. Together, it possibly explains the lack of correlation between sport factors (sport success as the most important factor) and DA among sport coaches, although these factors were consistently found to be important predictors of DA in athletes.

The most important limitation of this study is its cross-sectional nature. Therefore, causality cannot be interpreted, although in some cases, the cause-effect relationship is intuitively clear (i.e., gender is “the cause” and not the “consequence” of DA). Meanwhile, for most variables, a prospective study design in which changes in the studied variables are observed is necessary to clearly elucidate the possible relationships. Additionally, we included more males than females in the sample of participants. However, this is the global situation in sports, where females are generally underrepresented in coaching professions, especially in the team sports we have studied here.

Therefore, our results should be further evaluated in samples involving more females.

This is one of the first investigations on the factors associated with DA, specifically in team sport coaches. Additionally, the highly competitive level of our participants is an important strength of the study. Therefore, although not being the final word on a topic we hope that our results will initiate further research in the field.

Conclusion

Analyzing the factors associated with DA in sports could contribute to the development of more accurate and targeted antidoping education. While coaches play a significant role in the life and development of athletes, the factors associated with their DA are also important. We found that male sex was a risk factor for positive DA among team sport coaches. Therefore, anti-doping education should specifically target male coaches. Future (qualitative) studies should explore the background of this association and the factors that “protect” female coaches from having positive DA.

This study confirmed the association between one’s opinion that doping is present in the sport and positive DA. Although this is one of the first studies where such correlation is emphasized for coaches, the mechanisms of the relationships are relatively well known and include a lack of confidence in anti-doping measures, and level playing field (i.e. concept of the fairness based on the idea that all should play by the same set of rules).

The sport factors observed in this study (i.e., experience, success) were not associated with DA among team-sport coaches, indicating the need to identify other factors that could be correlated with DA among team-sport coaches. In doing so, it would be particularly important to highlight eventual differences in the possibility of achieving sport success in different sports. For example, the popularity of some sports directly defines the possibility of achieving success, which could logically blur the associations between sport factors and DA when participants from different sports are observed as one sample.

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