

Doping Knowledge and correlates of potential doping behavior in kinesiology students

Šime Veršić¹, Dora Marić^{1,2}, Damir Sekulić¹

¹ Faculty of Kinesiology, University of Split, 21000 Split, Croatia

² Department of Psychology, Educational Science and Human Movement, Sport and Exercise Sciences Research Unit, University of Palermo, 90100 Palermo, Italy

ABSTRACT:

Introduction: Consumption of banned performance-enhancing substances and prohibited techniques, presents one of the most essential problems in modern sport [1]. Previous researches indicated alarmingly poor knowledge on doping issues in athletes [2]. The aim of this study was to evaluate the level of knowledge on this topic on students of Kinesiology, future coaches, and sport practitioners. Methods: Study included 130 kinesiology students (19.45 ± 1.31 years) from the University in Split both female and male (53 female). Students were tested during the second semester of 2019/2020 academic year. Variables were collected through questions about socio-demographics, and doping-related factors. Descriptive statistics were calculated for age, sports experience, knowledge of doping, and subjective knowledge of doping. The Pearson correlation was used to assess the relationship between variables collected in the study. Results: Descriptive statistics is indicating low doping knowledge with an average score of 1.98 ± 1.79 : while 63% of students declared negative doping attitudes. Correlation analysis identified a statistically significant correlation between KD and potential doping behavior (PDB) (-0.32). Conclusion: Considering the fact that students of Kinesiology are future sports coaches, very low level of their doping knowledge and negative associations between KD and PDB, indicate a clear need for systematic education on doping among them.

Keywords: doping, students, knowledge, kinesiology

INTRODUCTION

Modern professional sport is extremely contaminated by the use of illegal stimulants. Various medical and pharmacological substances for increasing efficiency, collectively called doping, are one of the biggest problems of today's sport. In all professions where success depends on physical abilities and performance, people are looking for a way to do a job better or to get less tired [3]. This is especially the case in modern sports, in which only the first places are getting adequate recognition and in which the career of an athlete is valued exclusively through the prism of the achieved results. Doping in sports, in general, implies violation of anti-doping rules through the consumption of prohibited substances [4].

The problem of doping is twofold - it directly jeopardizes the health of the individual and at the same time it damages the image of sport and its basic values [5]. For these reasons, a lot of time and resources are invested in anti-doping campaigns. There are generally two approaches in the fight against doping. The first one is retributive and refers to the WADA anti-doping system, which involves taking samples of athletes and testing them for illegal substances [6]. Athletes are randomly selected for testing, and in the case of a positive sample, they face the sport and legal consequences. The second approach is preventive, it has been developed in previous years, and is based on the identification of factors related to potential doping behavior (PDB) [1, 7]. The basic assumption is that through the analysis of numerous factors (e.g. sociodemographic, sport, doping, religiousness...), groups of athletes who are at higher risk for doping consumption will be identified, and then this information will

be used effectively in creating specific anti-doping programs.

One of the factors often explored in this context is knowledge of doping [2, 8]. Previous researches indicated alarmingly poor knowledge on doping issues in athletes [9, 10]. Regardless of sports or geographical areas involved, the results of the studies regularly suggested that athletes were quite unaware of the technical, legal, and other aspects of doping. This data becomes even more important when we take into consideration that in many studies, knowledge about doping and nutrition has been identified as a protective factor for PDB [9, 11, 12]. In other words, athletes who have more information and knowledge about doping are less likely to resort to some of the banned drugs.

Some researches have shown that there is no significant difference in doping knowledge between coaches and athletes. In particular, such results were obtained in synchronized swimming where coaches and athletes achieved equally poor results on doping knowledge [10]. Given that coaches very often represent the primary source of knowledge about doping for their athletes, it is extremely important to identify the level of their knowledge and to educate them. The sample of participants consisted of students of Kinesiology, future coaches, and sports practitioners, who are already working or will work in the future with professional athletes. Therefore, the main aim of this study was to evaluate the level of their knowledge on this topic and to identify its relation with their doping attitudes.

METHODS

Participants

This study included 130 kinesiology students (19.45 ± 1.31 years) from the University in Split both female and male (53 female). Students were tested during the second semester of 2019/2020 academic year. All participants were informed about the aims of the study and voluntarily participated in the survey. The questionnaire was applied through the online Survey Monkey platform. The tests were performed live in the presence of examiners and in groups of at least 5 students. At the end of the questionnaire, the respondents sent their results for processing by clicking on the "Submit" option. All data were downloaded from Survey Monkey in a suitable format for processing.

Variables

Variables were collected through two previously validated questionnaires (i) Questionnaire of Substance Use (QSU) and (ii) Knowledge of Nutrition, Doping and Performance-Enhancing Drugs (KND).

QSU as a measuring instrument has been repeatedly proven to be highly reliable and valid and consisted of questions related to

[13, 14]: sociodemographic characteristics (including age, gender, marriage status, education level), sport factors (sports experience, age of starting with organized sports activities, highest achieved sports results and doping-factors (subjective knowledge on doping and nutrition, opinion about main doping problem, primary sources of knowledge on doping, number of doping testing, potential doping behavior).

KND questionnaire consisted of 20 questions (10 for nutrition and 10 for doping) [8, 9]. Participants marked each statement as TRUE or FALSE and if the answer was correct they received one point, and the final result is on a scale from 0 to 10 for both categories

Statistical analyses

Descriptive statistic parameters included arithmetic mean, standard deviation, minimum and maximum values for parametric and frequencies and percentages for non-parametric variables. Nonparametric Correlation (Spearman R coefficient of correlation) was calculated to establish association between score on knowledge on doping and nutrition and self-perception of knowledge and PDB. For all analyses, Statistica 13.0 (TIBCO Software Inc, USA) was used, and a p-level of 95% was applied.

STATISTICAL RESULTS

Table 1. Descriptive statistics

Variable	Mean	St.Dev.	Minimum	Maximum
AGE	19,36	1,19	18	22
SE	3,38	0,92	1	5
KD	2,05	1,84	0	7
KN	5,83	2,07	0	10

Legend: AGE – age of participant, SE – sports experience (years), KD – knowledge on doping, KN – knowledge on nutrition

Table 2. Frequencies (F) and percentage (%)

SKD	N	%
No knowledge at all	7	10,94
Low	32	50
Average	20	31,25
Good	1	1,56
Excellent	4	6,25

SKN	N	%
No knowledge at all	0	0
Low	13	20,31
Average	27	42,19
Good	22	34,38
Excellent	2	3,13

PDB	N	%
If I knew it would help me	2	3,12
If it will help, and not harm my health	9	14,06
I don't know if I would use it	14	21,87
I wouldn't use it	39	60,93

Legend: SKD – subjective knowledge on doping, SKN - subjective knowledge on nutrition, PDB – potential doping behavior

Table 3. Spearman R coefficient of correlation

	PDB	SKD	SKN
KD	-0.32*	0.16	0.11
KN	0.09	-0.05	0.18

Legend: KD – knowledge on doping, KN – knowledge on nutrition, SKD – self-perception knowledge on doping, SKN - subjective knowledge on nutrition, PDB – potential doping behavior

DISCUSSION

The aim of this study was to identify the level of KD and KN in kinesiology students and to determine the possible association between knowledge and PDB. Considering the stated goals, the most important findings of this study are (i) alarmingly low level of KD issues and (ii) significantly negative correlation of KD and PDB.

As previously mentioned, KD was detected as an important factor in the analysis PDB [15, 16]. The questionnaire used in this study was also used in previous studies that investigated doping knowledge so the results can be compared with each other. [8, 10, 11, 17]. When the results are compared with a study conducted also on students, a significantly worse result in KD can be noticed (2.05 and 5.1 respectively) [17]. This obvious decline in the level of knowledge is quite surprising. A potential hypothetical explanation for this phenomenon may lie in the fact that there is decline of active athletes among students of Kinesiology in recent years, who have been educated about the problem of doping within their sports collectives. Since this issue has not been systematically analyzed, for clear confirmation of this hypothesis, additional future investigation should be done. Moreover, the respondents in this study also showed less knowledge than rugby players, synchronized swimmers [8, 10, 11]. Therefore, there is a clear need to implement anti-doping educational

program in the curriculum for the study of Kinesiology.

Studies have often attempted to establish a link between KD and PDB in athletes [7, 9, 10, 12, 18]. Although the results are not consistent, KD has been confirmed as a protective factor in samples of synchronized swimmers, tennis players, and athletes in team sports [9-11]. In general, we can assume that the individuals who have more knowledge of doping issues and are more aware of all negative consequences, will have a lower tendency to use it. This finding additionally emphasizes the need for systematic education on doping problematic, for both athletes, and coaches.

On the other hand, no significant association was found between KN and PDB. This result is not in accordance with most of the previous studies that detected KN also as a protective factor for PDB [9, 11]. The authors explained this by assuming that athletes with greater nutritional knowledge would have a better quality diet and use optimal nutritional supplements which would lead to an improvement in their physical capacities and thus reduce the likelihood of doping use [9, 19]. Given that in the here observed sample, is a big difference between KN and KD, it is obvious that KN will not play a big role in PDB, but the level of KD will push individual more or less towards doping.

CONCLUSION

Results of this study showed an alarmingly low level of knowledge on doping issues among students of Kinesiology. Given that they will work with top professional athletes in the future, they should be educated about all health, technical and legal frameworks of doping in order to prevent their athletes from using illegal substances. Coaches should be role models for their athletes and build their authority

with knowledge. This is especially important in the context of doping since the knowledge on that topic is a clear protective factor for PDB.

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