

## ORIGINAL SCIENTIFIC PAPER

# Factors Associated with Potential Doping Behaviour in Windsurfing

Sime Versic<sup>1</sup>, Ognjen Uljevic<sup>1</sup> and Katarina Pelivan<sup>1</sup><sup>1</sup>University of Split, Faculty of Kinesiology, Split, Croatia**Abstract**

Windsurfing is dynamic water Olympic sport in which surfer is using wind force to generate forward motion on the water while maintaining balance on the board. Although is fast-raising and popular sport, previous studies have not addressed the issue of doping in this sport. The main aim of this study was to identify predictors of potential doping behaviour in windsurfing. The sample of participants included 48 senior windsurfers (40 males, 8 females, average age 31.1) in slalom class. The testing occurred during European Championship 2014. The participants filled previously validated questionnaires that included socio-demographics and doping-related factors variables. Descriptive statistic parameters were calculated and binary logistic regression was used to determine association between predictors and criterion (potential doping behaviour). Only 60% participants showed negative attitude towards potential usage of doping, while the rest of them were positive or neutral. Logistic regression identified only opinion about penalties for doping offenders as a predictor of potential doping behaviour in windsurfers (OR: 2.99, 95% CI: 1.44-6.2). The results of this study showed that windsurfers who advocate higher penalties for doping offenders are less likely to use doping. The lack of association of other variables with the criterion can probably be attributed to the heterogeneous sample of windsurfers since most of them are recreational sailors. In future studies windsurfers for other disciplines and additional predictor variables should be included.

**Keywords:** windsurfing, doping, slalom, doping knowledge

**Introduction**

One of the burning problems of modern sport is the use of prohibited substances, commonly known as doping (Baron et al., 2007). Doping violations include the consumption of performance-enhancing substances that are on the list, annually revised by the World Anti-Doping Agency (WADA), or the use of prohibited techniques such as covering up traces of doping in the body (Mazzeo & Di Onofrio, 2019; Mazzeo, Santamaria, & Montesano, 2019). WADA conducts regular testing of athletes, either during training period or during competition, and in case that traces of drugs are found in an athlete's blood or urine sample, the athlete bears certain consequences. They are most often of a sports nature, in terms of deleting the results achieved with the help of doping and exclusion from competi-

tion for a certain period of time (Petroczi, 2016; Zvan, Zenic, Sekulic, Cubela, & Lesnik, 2017). Recently, another, preventive approach has been used in the fight against doping. The basis of this way of combating the use of doping is in researching and analysing the factors related to potential doping behaviour (PDB). In numerous studies, the connection between various socio-demographic, sports, doping and many other groups of factors that can either prevent or "push" an athlete in the direction of doping consumption has been investigated (Devic et al., 2018; Zvan et al., 2017). In this way, specific anti-doping programs can be created for certain groups of athletes.

Windsurfing is discipline of sailing and is globally very popular at both recreational and competitive levels (Dyson, Buchanan, & Hale, 2006). It was invented in 1960s in Southern



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California and has six disciplines which can be divided in race boarding and slalom as two major divisions based on differences in equipment and type of activity (Dyson et al., 2006; Nathanson & Reinert, 1999). Windsurfing is physically highly demanding sport as it requires the whole body strength and endurance while maintaining balance position on the board and speed of the movement in line with the wind (Dyson et al., 2006). In general, prevalence of doping in sailing is very low with only 0.4% of positive findings among all sailing disciplines, including windsurfing where there was no any positive finding in windsurfers in RS:X discipline (WADA, 2019). However, since increased popularity and number of competitions worldwide, there is a clear need to investigate doping issues in the population of windsurfers in order to keep it as doping-uncontaminated sport. The analysis of scientific literature showed there are no any studies regarding this topic. Therefore, the main aim of this study was to examine doping factors and attitudes toward doping issues among windsurfers and evaluate correlates of potential doping behaviour.

## Methods

Sample of participants in this study consisted of 48 windsurfers (8 females, on average 31.1 years old). There were tested between in Bol, island Brač in Croatia, during the 2014 European championship in windsurfing slalom discipline. Tests were conducted with questionnaires on English in groups of at least five athletes who were informed that the survey was strictly anonymous. Participants could refuse to participate, leave some of the questions or the entire questionnaire unanswered, and submitting a completed questionnaire was considered consent to participate in the survey.

All data were collected with previously validated

Questionnaire of Substance Use (QSU) and Knowledge of Doping and Performance-Enhancing Drugs (KD) (Devic et al., 2018). QSU consisted of (i) sociodemographic characteristics, (ii) sport factors and (iii) doping factors. Sociodemographic part included questions regarding participants age, gender, marital status and level of education. Sport factors were sport status, training experience in windsurfing, the highest competitive result achieved in junior and senior competition. Finally, doping factors included following items: self-assessment of doping knowledge, opinion on the main problem of doping in sports, trust in terms of doping and nutrition, source of knowledge about doping and food supplements, number of tests for banned substances during their career so far, opinion on the presence of banned substances in their sport, opinion on penalties for doping and potential usage of doping, i.e. potential doping behaviour (PDB). KD consisted of two sets of 10 claims about doping and nutrition which participants highlight as true or false. In case of correct answer, participants get 1 point and the final result was on the scale from 1 to 10.

Statistical analysis included descriptive measures, frequencies and percentages or mean and standard deviation, depending on the type of the variable. To evaluate association between predictors (socio-demographic, sport and doping factors) and binomial criterion (positive or negative doping behaviour) binary logistic regression was used. For all analyses, Statistica 13.0 (TIBCO Software Inc, USA) was used, and a p-level of 95% was applied.

## Results

Table 1 shows descriptive parameters, showed as frequencies and percentages for non-parametric variables and arithmetic mean and standard deviation for parametric.

**Table 1.** Doping factors in windsurfers – frequencies and percentages

<b>Personal opinion about knowledge on doping</b>	<b>n</b>	<b>%</b>
I have no knowledge	8	16.67
Poor	19	39.58
Average	12	25.00
Good	8	16.67
Excellent	1	2.08
<b>Trust in doping issues</b>		
Nobody	22	45.83
Doctor	10	20.83
Coach	3	6.25
Doctor and coach	13	27.08
<b>Main problem about doping</b>		
Health	21	43.75
Fair play	7	14.58
I'm not sure doping should be prohibited	17	35.41
Doping should be allowed	2	4.17
<b>Opinion about penalties for doping offenders</b>		
Lifelong suspension	11	22.92
First time milder punishment, than lifelong suspension	16	33.33
Suspension for couple of seasons	13	27.10
Financial punishment	6	12.50

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<b>Personal opinion about knowledge on doping</b>	<b>n</b>	<b>%</b>
Doping should be allowed	2	4.17
<b>Potential doping behaviour</b>		
If assured it will help me	1	2.08
If assured it will help me with no health hazard	3	6.25
Not sure about it	14	29.17
I will not use doping	29	60.42
<b>Doping in windsurfing sport</b>		
I don't think doping is used in sailing	19	39.58
Don't know/Not sure	18	37.5
Used, but rarely	9	18.75
Doping is frequent	2	4.17
	<b>Mean</b>	<b>SD</b>
Age	31.1	9.08
Experience in sailing	9.13	8.36
Doping knowledge	2.23	1.48
Nutrition knowledge	4.08	3.25

Results of binary logistic regression are presents in Table 2. It is clear that only variable of Opinion about penalties for

doping offenders is significantly associated with PDB (OR: 2.99; 95% CI: 1.44-6.22).

**Table 2.** Correlates of potential doping behaviour in females and males.

<b>Socio-demographic, sport and doping factors</b>	<b>OR (95% CI)</b>
Age	1.02 (0.95-1.09)
Gender	1.79 (0.39-8.27)
Educational level	1.35 (0.70-2.62)
Sport status	0.93 (0.40-2.17)
Sport achievement junior level	0.69 (0.21-2.30)
Sport achievement senior level	0.88 (0.45-1.75)
Smoking	1.02 (0.61-1.71)
Alcohol consumption	1.20 (0.67-2.11)
Religiousness	1.05 (0.97-1.13)
Subjective nutrition knowledge	0.94 (0.52-1.70)
Subjective doping knowledge	1.02 (0.57-1.80)
Use of supplements	0.90 (0.43-1.87)
Trust in doping issues	1.48 (0.92-2.39)
Trust in nutrition issues	0.97 (0.59-1.62)
Source of knowledge about doping and nutrition	1.18 (0.77-1.81)
Number of doping tests performed	1.98 (0.41-9.68)
Opinion on the presence of doping in wind-surfing	2.08 (0.99-4.38)
Opinion about penalties for doping offenders	2.99 (1.44-6.22) *
Doping knowledge	1.11 (0.75-1.66)
Nutrition knowledge	1.02 (0.85-1.22)

## Discussion

There are several major points of this study. First of all, looking at doping attitudes we can conclude that 60% windsurfers have negative attitude toward doping, i.e. negative doping behaviour. Around 29% have neutral opinion while approximately 8% showed inclination to doping consumption

(positive doping behaviour. Also, what is partly unexpected when recent trends are taken into account, most windsurfers view doping as a health threat rather than a violation of fair play. Here observed windsurfers showed extremely low level of doping knowledge with only 2.2 average points on KD. Finally, of all observed predictors, only opinion about penalties for

doping offenders showed to be associated with PDB.

If this results are compared with results of previous similar studies, that used the same measuring instruments, we can say that windsurfing has high tendency in doping. For example smaller possibility of doping behaviour was found in Olympic sailing (81.8% of athletes have a negative doping attitude), swimming (71-82%), dancing (71% women and 90% men) and women in racket sports (64.5-100%) ( Devcic et al., 2018; Veršić, 2020; Zenic, 2010; Zvan et al., 2017 ). A similar probability that athletes will reach for banned substances has been observed in team sports (56.7 - 69.9% for men and 58.2 - 66.7% for women), synchronized swimming (62-63%), rowing (60%) and in men in racket sports (52.4 - 66%) (Zenic, 2010; Zvan et al., 2017). Finally, the only two sports with higher potential doping use are rugby (51.4%) and kickboxing (47.8% men, 42.1% women) (Veršić, 2020). However, large number of neutral PDB should be emphasized, as this clearly “worsen” the whole picture. As stated before, windsurfers in this study achieved very low results on KD so this probably resulted in high number of neutral answers regarding PDB as they probably chose that answer (“Not sure about it”) because of their complete ignorance of the whole doping problem. This probably caused them to answer the question about the main problem of doping more conservatively (health related consequences), ie to emphasize the attitude that prevailed in the past but which in recent times has been substituted with a violation of fair play as a major problem.

The only significant predictive factor for PDB in windsurfers is the opinion about penalties for doping offenders. In short, participants who are asking for more rigorous punishments for doping violations are less prone to use doping.

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#### Conflict of Interest

The authors declare that there is no conflict of interest.

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Similar findings were found in the study on Olympic sailors. However, authors of this study have linked that finding and the fact that sailors look at doping as mainly a fair play problem (Veršić, 2020). Author's explanation was that by observing doping in this way, athletes see the ones who consume doping as fraudsters which gain unfair advantage over competitors. For these reasons, it is logical to expect those who are less prone to doping to require heavier penalties for offenders, such as annulment of results and medals to suspension from training and competition for a specified period of time. However, as mentioned before, participants in this study did not put to much emphasize on fair play issues of doping. In light of this, results obtained herein can be explained in the logical context that that windsurfers who do not intend to use doping to improve their performance expect harsher penalties for colleagues who try to gain an advantage by using doping substances.

#### Conclusion

Results of this study indicated very low levels of doping knowledge among windsurfers and relatively high tendency in doping behaviour. It is clear there is a need of systematic education of windsurfers on all aspects regarding doping, including legal, health and many others.

Although windsurfing, as discipline in sailing, is a sport not contaminated by doping, high physical demands and growing popularity worldwide suggest that all preconditions should be made to keep it that way and prevent a possible increase in the consumption of prohibited drugs. In future studies larger sample of windsurfers should be included and also participants from multiple windsurfing disciplines.

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