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Please cite this article: ANALYSIS OF KNOWLEDGE AND ATTITUDES OF THE STUDENTS AT COLLEGE OF HEALTH AND PROFESSIONAL STUDIES REGARDING THE USE OF STIMULATIVE SUBSTANCES IN SPORTS

ANALIZA ZNANJA I STAVOVA STUDENATA ZDRAVSTVENIH STUDIJA O UPOTREBI STIMULATIVNIH SUPSTANCI U SPORTU


UDC:

DOI: https://doi.org/10.2298/VSP170214078S

When the final article is assigned to volumes/issues of the Journal, the Article in Press version will be removed and the final version appear in the associated published volumes/issues of the Journal. The date the article was made available online first will be carried over.
Analysis of knowledge and attitudes of the students at College of health and professional studies regarding the use of stimulative substances in sports

Analiza znanja i stavova studenata zdravstvenih studija o upotrebi stimulativnih supstanci u sportu

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**Introduction:** Since the beginning of competitive sports, athletes have been trying to improve their abilities by taking various substances. The problem of using prohibited substances is not strictly tied to elite athletes; it is also present in general population.

**Aim:** To test the knowledge and attitudes of the students regarding the use of stimulative substances and dietary supplements in sports.

**Methods:** A cross-sectional study was performed among students at College of health and professional studies. The data was collected by filling in an especially designed questionnaire.

**Results:** Knowledge of prohibited substances and methods was characterized as “good” with 24.2% of respondents, namely 8.09% of males and 16.1% of females; whereas knowledge of the adverse effects of prohibited substances and methods on health was demonstrated by 17.7%, which is 9.03% of male respondents and 8.72% of female respondents.

**Conclusion:** Student population is not knowledgeable enough about the problem of prohibited substances use and the negative effects the substances have on one’s health. The comparative analysis of our and European researches on knowledge, attitudes and uses of prohibited substances show a rather uniform prevalence rate. Not being aware of the adverse effects shows the need to further educate students.

**Key words:** anabolic steroids, dietary supplements, students, sports, doping

**Sažetak/Apstrakt**

**Uvod:** U takmičarskom sportu, sportisti pokušavaju da poprave svoje sposobnosti uzimanjem različitih supstanci. Problem korišćenja nedozvoljenih supstanci nije isključivo vezan za elitne sportiste, već je prisutan i u opštoj populaciji.

**Cilj:** Ispитати знанje и ставове студената у вези са употребом стимулативних супстанци и дјететских сусплмената у спорт.

**Metode:** Спроведена је студија пресека студентске популације у Високој здравственој шкoli strukovnih студија у Београду. Подаци су прикупљени попунјавањем posebно dizajniranog upitnika.

**Rezultati:** Dobro znanje o nedozvoljenim supstancama i metodama, kao „добро znanje“
pokazalo 24,2% (8,09% ispitanika muškog pola i 16,1% ispitanika ženskog pola), a o
neželjenim efektima zabranjenih supstanci i metoda na zdravlje, pokazalo 17,7% (9,03% ispitanika muškog pola i 8,72% ženskog pola).

Zaključak: Populacija studenata nema dovoljno znanja o problemu upotrebe nedozvoljenih supstanci i svim njihovim negativnim posledicama po zdravlje.
Komparativna analiza našeg i evropskih istraživanja znanja, stavova i upotrebe nedozvoljenih supstanci ukazuje na približno ujednačene stope prevalencije. Nepoznavanje neželjenih efekata ukazuje na potrebu za dodatnom edukacijom studenata.

Ključne reči: anabolički steroidi, dijetetski suplementi, studenti, sport, doping

Introduction

Testosterone was synthesized in laboratory in 1931 for the first time, thus allowing clinical experiments with this hormone (1). Its use has been around for more than 80 years, and there is much more experience behind the use of testosterone than for some newer medicines physicians prescribe today. The use of stimulative substances with the aim of building up muscle mass and improving sports results spread like fire among sports competitors during the sixties and the seventies of the last century. During that time stimulative substances were unknown outside the locker rooms and little was done to prevent their use. Today, the anti-steroid movement is very strong. Hardly a day passes without some information about the dangers connected to their use being published. At the same time, the use of steroids aimed at improving physical performances has never been higher. The fact that doping is no longer limited to elite athletes is particularly dangerous.
Numerous studies report on doping use being found among the young in amateur and school sports. Many of them use anabolic steroids in order to improve the way their body looks, not to have more success in competitions (2-8).

In the last couple of years, there was a significant shift in researches on doping - from discovery and secondary prevention to primary prevention through education. (9) Important components of these basic prevention strategies are: to identify target groups, to evaluate their knowledge and attitudes concerning doping, as well as to determine efficient initial basis for intervention (10). These studies focus on individuals who do sports, and who might benefit by using these substances; on coaches, whose task is to provide safety in sports, which is in direct connection to the success of their athletes; on physicians and
pharmacists, whose medical advice might influence the knowledge of and attitudes towards the use of stimulative substances (11).

Numerous researches have been performed among the adolescents in order to obtain data on the stimulative substance misuse, their knowledge of the adverse effects, and their attitudes towards taking prohibited substances. The largest number of researches have been performed among the American adolescents, namely the ones doing sports. In the USA, 375,000 of male respondents and 175,000 of female respondents (12) have used AAS (anabolic-androgenic steroids) at least once. Other authors who have performed their researches in the USA state that the percentage of the AAS users is 6.6% (13). In Europe, a research has been performed in six European countries (14), which showed that the percentage of high school children using the AAS is 2.1%.

The aim of this research was to test the knowledge, attitudes and behaviours of the students at the College of health and professional studies regarding the use of stimulative substances and dietary supplements in sports.

**Materials and methods**

There were 321 respondents in this study, 34% of which male and 66% female. All of the respondents attend College of health and professional studies, which makes 16.2% of the total number of students. Average age 21.2 (minimum age 19, maximum age 38, MED 24.0, SD 2.1). The average subject age per gender was not statistically significantly different (t=1.344; p>0.05).

Three departments were included in the survey: 87 medical radiologists (27.1%), 143 physiotherapists (44.5%) and 91 laboratory technicians (28.3%). As for their year of studies, there were 89 first year students (27.7%), 112 second year students (34.9%), and 120 third year students (37.4%). It was determined that 87 respondents were born in Belgrade (27.1%), and 234 (72.9%) were from the provinces.

Majority of students were involved in some type of sports activities: volleyball 18.7%, basketball 15.6%, football 14.3% and body building 10%. Prohibited substances were used by 3.7% of male respondents and 2.2% of female respondents. A cross-sectional study was performed at the College of health and professional studies during the summer semester of 2015/16. The size of a respondent group was determined based on the initial parameters: power of the study - 80%, probability of Type I error (α) - 0.05, minimum difference in the
values of the observed variables - 20%. The research included 321 students at various years of their studies, randomly selected. The respondents had 20 minutes before their classes to voluntarily and anonymously fill in the questionnaires. All students had the same questions and answered them in a same manner. They were guaranteed discretion for their voluntary and anonymous participation. In order to test the comprehensibility of the questions given, the questionnaire had been validated on a small sample of 12 respondents before being made a part of the research. The questions the students had found incomprehensible were paraphrased and the final version of the questionnaire was determined. The questionnaire contained multiple choice questions and the respondents answered by circling answers. The exception was the question about the types of stimulative substances and dietary supplements used by the respondents. This question was answered by naming the substance or supplement being used.

**Instruments**

Surveying the respondents was done by using the anonymous epidemiological questionnaire. The respondents gave answers to short questions (both open-ended and closed-ended questions) by writing down relevant information or by choosing from the provided answers. Main research questions were sorted into four categories: a) Sociodemographic data (gender, age, place of birth, family income, sport the respondent is engaged in, current year of studies, exam pass rate and satisfaction with oneself as a student); b) General perception, knowledge of doping substances and methods and knowledge of adverse effects of doping to one’s health (9, 10, 11); c) *Performance Enhancement Attitude Scale* (PEAS) (15) The scale is used to measure general doping attitudes. Doping attitude is defined as a predisposition of an individual to use prohibited doping substances and methods. The scale consists of 17 attitude statements, which are measured on a six point Likert-type scale ranging from strongly disagree 1 to strongly agree 6. No neutral middle point is offered, and all 17 items are scored in the same direction; d) Use of substances and/or supplements in order to enhance sports performance or improve physical appearance.

**Statistical data processing**

Incomplete questionnaires (9 in total) were not processed. Collected data was reviewed and coded, then processed and presented in tables and charts along with a commentary of the
aforementioned, depending on the nature of the observed variable. Description of numerical characteristics in our paper was performed by using classical methods of descriptive statistics, namely by arithmetic mean and median of mean values, and as for measures of variability by standard deviation, coefficient of variation and standard error, as well as by minimum and maximum values. Relative numbers are used in all tables. Distribution of numeric variables in our paper was checked by using the Kolmogorov-Smirnov test, normal distribution was tested. Variables that met this criterion, that is, that had normal distribution, were further analysed by parametric methods; non-parametric methods were used on those that did not meet the said criterion. The analysis of results, depending on the nature of variables themselves, used Pearson’s chi-squared test, in the form of goodness-of-fit test and contingency tables, in order to compare the differences between frequencies of non-parametric characteristics, namely for one or two characteristics. We used Student’s t test for two sets of data to compare the means of parametric characteristics. As a non-parametric addition to independent samples we applied Rank Sum Test; and to dependent samples - Wilcoxon signed-rank test. When performing linkage analysis of our characteristics, we used methods of one-tailed parametric correlation and regression, as well as non-parametric correlation, depending on data distribution. For analysis purposes, three scores were defined: score 1 represents the points won on that part of the questionnaire concerning general knowledge of doping where higher number of points meant greater knowledge, score 2 for the knowledge of side effects where higher number of points meant greater knowledge of effects, and score 3 concerning the attitude towards doping (substances and supplements for strength enhancement) where higher number of points meant more pronounced positive attitude towards doping. In all analytical methods applied the significance level was set at 0.05. Program SPSS 20.0 of the Department for Medicinal Statistics and Informatics, Faculty of Medicine in Belgrade, was used to make a data base and process the data.
Results

Students’ knowledge of and attitudes towards the use of prohibited substances and supplements in sports

Table 1. Descriptive statistical values for calculated scores
“Good knowledge” was demonstrated by 31.2% respondents for General knowledge of doping, and by 34.2% respondents for knowledge of doping and doping side effects.

Table 2. Score comparison per gender
Average score comparison according to the gender of our respondents showed there is a statistically highly significant difference in all three scores; scores for General knowledge of doping and Knowledge of doping side effects were higher with female respondents, whereas male respondents had higher average scores for Attitudes towards doping.

Table 3. Score comparison per department
Average score comparison per department of our respondents showed there is a statistically significant difference in scores achieved for General knowledge of doping and Attitudes towards doping: laboratory technicians had the highest average scores, that is, the greatest knowledge of doping, and physiotherapists had the poorest general knowledge. Medical radiologists had the smallest score for Attitudes towards doping which means that they have the most pronounced negative attitude towards doping, and the highest score was achieved by physiotherapists who, therefore, have the least pronounced negative attitude towards doping. There was no statistically significant difference in Knowledge of doping side effects scores per department.

Table 4. Score comparison per study year
Analysis of the average score values per subjects’ study year has shown that there is a statistically significant difference only in the “Attitudes on doping” score, wherein the subjects in the second and the third year of studies had lower, and the first-year students had the highest average values. No statistically significant differences between study years have been recorded in the score values of the General knowledge and Knowledge of doping side effects.

Table 5. Score comparison per habit of engaging in sports
Analysis of the average score values regarding the habit of engaging in sports has shown that there is no statistically significant difference in average values of all three observed scores.

**General perception of the use of substances and/or supplements for the increase of strength and muscle definition in sports**

Table 6. Score comparisons with regards to the question: **Do you think that use of substances to improve efficiency in sports is unethical?**

Analysis of the average score values regarding the attitude on the ethics of the use of substances to improve efficiency in sports, in our subjects, has shown that there is a statistically significant difference in the average score values for the Knowledge of doping side effects and Attitudes on doping; therefore, the subjects who deem that the use of substances for improvement purposes is unethical also know more about them, but at the same time they have a more distinct negative attitude on doping. Score values for General knowledge of doping did not significantly differ from the answers to the question: **Do you think that use of substances to improve efficiency in sports is unethical?**

Answering the question: **What are the sources they like using the most to obtain information on doping?**

Our subjects stated that most commonly they obtain information on doping from books (71.9%), their pharmacists (71.3%), which is followed by personal trainers (69.2%), personal physician 67.2%, Internet 65.3%. The interesting thing is that learning about doping from parents was not even within the top five stated sources, with only 55.4% of answers. When average values of the three analysed scores of the first three sources were compared, no statistically significant difference were observed.

**Discussion**

Results of this research have provided certain information on attitudes and knowledge of students from three study departments (physiotherapeutists, laboratory technicians and medical radiologists) regarding the problem of the use of stimulative substances in sports. The research may be of importance due to population covered by the research, since it is a
young population whose priority is victory or better appearance, while their health is of secondary importance.

In scoring of the answers to questions on general knowledge of doping and knowledge of side effects, the answers were rated cumulatively.

Blank et al. states that in his research received almost identical results. (16) Comparison of the general knowledge as well as knowledge of side effects depending on the gender of our subjects, shows that female subjects have shown greater general knowledge on prohibited substances and greater knowledge on adverse effects to the organism compared to the male subjects. Students’ attitudes regarding the use of stimulative substance and dietary supplements show higher average values in male respondents, which indicates that they have a less distinct negative attitude towards doping compared to female respondents. Female respondents had greater knowledge of the problems related to doping as well as side effects, compared to the male respondents.

As opposed to our research, Blank concluded in his research that there was a correlation between gender and knowledge, which could be connected to the fact that there was also correlation between gender and higher participation in sports activities. Male subjects were more engaged in sports and showed better results in terms of knowledge. Experience in the use of stimulative substances in the preceding period had not significantly affected knowledge. It would seem logical that someone who used stimulative substances has greater knowledge of all such substances. (16)

Comparison of the average score values between the study departments of our respondents has shown that students from the laboratory technicians department have the highest average values i.e. the best general knowledge of doping, and physiotherapists have the lowest, that is the poorest general knowledge.

The “good knowledge” limit point is set at 80% of correct answers to the asked questions. (15) In comparison of the general knowledge and the use of stimulative substances, one third of non-using respondents and respondents using stimulative substances have shown “good knowledge”, and the limit point is a result of a greater general knowledge of doping among the non-using respondents. In comparison of the general knowledge and the use of stimulative supplements, non-using respondents have shown “good knowledge” and respondents using supplements have shown worse knowledge, and the limit point is a result of a greater general knowledge of doping side effects among the respondents not using supplements.
In comparison of the knowledge of the adverse effects and the use of the strength increase substances, non-using respondents have shown better knowledge than respondents using prohibited substances, and the limit point is a result of approximately equal number of correct answers to questions regarding respondents’ general knowledge. In comparison of the knowledge of adverse effects and the use of supplements, non-using respondents shown better knowledge than respondents using supplements, and the limit point is a result of a greater general Knowledge of doping side effects among the respondents not using supplements.

Other researchers have found bigger differences in knowledge that respondents have shown “good knowledge” in the section of general knowledge of doping and respondents in the section of Knowledge of doping side effects. (16)

These values of knowledge scores are a strong invitation for further research on the factors which affect general knowledge of doping and knowledge of side effects, which ought to be included in pre-emptive measures for educational purposes.

Knowledge and attitudes of student population regarding the problem of doping in sports were research subjects of certain authors (9). Melia et al. conducted a survey of five Canadian regions, which included 107 schools in order to determine the prevalence of the use of anabolic-androgenic steroids, their attitudes and knowledge about doping. The results showed that many of them used prohibited substances in the year prior to the survey, and that significant number of respondents stated that they were using other substances in attempts to improve sports results. Results were alarming and unexpected for teachers, healthcare and sports professionals (17).

In score values for general knowledge and knowledge on side effects, no statistically significant differences were recorded between the study years; nevertheless, the difference was registered in the score increases between the study years. This surely indicates the fact that curriculum content is not sufficient for a significant change of the required knowledge.

In analysis of the attitudes on the use of stimulative substances and dietary supplements, we found higher average values in male respondents. So, female respondents had greater knowledge of the problems related to prohibited substances as well as side effects, and male respondents had less distinct negative attitude towards doping compared to female respondents.

Results on the attitude scale largely depend on statements, and this may lead to underestimated results since respondents hesitated to respond honestly. Even in conditions of anonymity, respondents may respond in a manner they believe to be socially desired or expected. Correlations found in this research are significant but not sufficient, which
indicates the fact that there are other unidentified factors which could contribute to a greater knowledge and attitudes regarding the use of stimulative substances.

Our respondents’ study years show that a statistically significant difference exists only when comparing score values for the attitudes, where the students in the second and the third year of studies had lower, and the first-year students had the highest average values. Such a result means that poorly expressed negative attitude on doping at the beginning of the studies is slowly corrected and improved in the subsequent study years, where students have more and more distinct negative attitude on doping, and the physiotherapists had the highest values, as they have the least negative attitude on doping.

Analysis of the average score values for the attitude of our respondents on the ethics of use of substances to improve efficiency in sports, has shown that there is a statistically significant difference between the average score values of the knowledge on side effects and attitudes. Students, who deem that the use of substances for improvement is unethical, also know more about their side effects and have a distinctly more negative attitude on doping. General knowledge of the prohibited substances did not significantly affect perception of ethics.

Students with greater general knowledge on prohibited substances show better general perception in understanding frequency of use of the substance to improve efficiency in sports. Adoption of the new global Anti-Doping Code in 2015 resulted in altered rules. Today it is clear that one cannot possibly test all sports in the same manner and that changes ought to be made to the manner of as well as to the approach to the fight against doping. People and their perception of doping are much more important than new analytical methods. The basis of the doping problem is primarily harmfulness of the effects to certain organ systems caused by the use of doping substances, young people should be especially warned about this (18).

Most common sources used by our students to obtain information on doping, although their selection does not affect the knowledge and attitudes about doping, are printed media, books, pharmacists and personal trainers as well. Slightly smaller but still significant number of reports that are personal physician and Internet. The interesting thing is that learning about doping from parents was not even within the top five stated sources.

In his research, Blank stated that the majority of respondents sought information on the prohibited substances on the Internet in publications and the least often from physicians. As for the supplements, a high number of respondents deemed that they have insufficient
information on supplements, and the majority of respondents stated that they obtained information from multiple sources. Students who obtained information from a single source have mainly referred to media as the source of data on dietary supplements (16). Internet was the main source of information on dietary supplements for the students in Poland (18). Since a large number of respondents obtain information from the media and from friends, the greatest attention should be paid to promotion of proper use of dietary supplements, which is conducted by physicians and pharmacists. In according to foreign research, 72% of physicians and 89% of medical nurses recommend the use of dietary supplements (19).

There are numerous research studies on the parents’ role in the behaviour and attitude modulation in terms of prevention of high-risk behaviour related to sexual behaviour and smoking (20). Nevertheless, there are no studies to deal with the parents’ impact on the behaviour of children in connection with some other forms of high-risk behaviour, such as doping. Purpose of such researches would be to assess parents’ knowledge and attitudes depending on the child’s age, as a first step towards proposing educational and pre-emptive intervention. Parents were neglected in doping prevention literature; now, with doping interventions shifting towards prevention and education, this type of assessment are needed, as well as assessments in order to determine knowledge and current education status of target groups, such as parents. Based on the previous research, emphasis of future educational campaigns ought to be put on the contents which regard effects on health.

It is important to point out at the end that correlations obtained in this research are significant but not sufficient, which indicates the fact that there are other unidentified factors which could contribute to greater knowledge and better attitudes regarding the use of stimulative substances;

CONCLUSIONS
The use of stimulative substances is not a only a problem of elite sportsmen, it also exists in general population and represents a general social problem; The results obtained from the student population with regards to the attitudes on the use of prohibited substances, knowledge and informedness of doping adverse effects, justify further similar researches.
Study limitations:
- research was not performed in all departments of the College of health and professional studies;
- questionnaires were completed under a professor’s supervision, which naturally resulted in higher rate of desirable answers;
- although the survey was anonymous, the respondents personally handed in the completed questionnaires to the person performing the survey.
## Tables

### Table 1. Descriptive statistical values for calculated scores

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<th>Scores</th>
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### Table 2. Score comparison per gender

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* p < 0.05
**p < 0.01
Table 3. Score comparison per department

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<td>38.57</td>
<td>14.45</td>
<td>36.18 - 40.96</td>
<td>17.00</td>
<td>74.00</td>
<td>8.005</td>
<td>0.000**</td>
</tr>
<tr>
<td></td>
<td>laboratory technician</td>
<td>91</td>
<td>34.70</td>
<td>13.45</td>
<td>31.90 - 37.50</td>
<td>17.00</td>
<td>68.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Total</td>
<td></td>
<td>321</td>
<td>35.48</td>
<td>13.99</td>
<td>33.94 - 37.01</td>
<td>17.00</td>
<td>74.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

* p < 0.05
**p < 0.01
Table 4. Score comparison per study year

<table>
<thead>
<tr>
<th>Score</th>
<th>Study year</th>
<th>N</th>
<th>X</th>
<th>SD</th>
<th>95% IP for the average</th>
<th>Minimum</th>
<th>Maximum</th>
<th>f</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Bottom limit</td>
<td>Upper limit</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>General knowledge of doping</td>
<td>first year</td>
<td>89</td>
<td>11.05</td>
<td>2.66</td>
<td>10.49</td>
<td>11.61</td>
<td>4.00</td>
<td>15.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>second year</td>
<td>112</td>
<td>11.16</td>
<td>2.92</td>
<td>10.61</td>
<td>11.70</td>
<td>0.00</td>
<td>15.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>third year</td>
<td>120</td>
<td>11.72</td>
<td>2.27</td>
<td>11.31</td>
<td>12.13</td>
<td>3.00</td>
<td>16.00</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>321</td>
<td>11.34</td>
<td>2.63</td>
<td>11.05</td>
<td>11.63</td>
<td>0.00</td>
<td>16.00</td>
<td>2.073</td>
</tr>
<tr>
<td>Knowledge of doping side effects</td>
<td>first year</td>
<td>89</td>
<td>13.66</td>
<td>5.01</td>
<td>12.60</td>
<td>14.71</td>
<td>0.00</td>
<td>20.00</td>
<td>0.586</td>
</tr>
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<td>14.21</td>
<td>4.68</td>
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<td>15.09</td>
<td>0.00</td>
<td>23.00</td>
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</tr>
<tr>
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<td>120</td>
<td>13.57</td>
<td>4.69</td>
<td>12.72</td>
<td>14.42</td>
<td>0.00</td>
<td>21.00</td>
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</tr>
<tr>
<td></td>
<td>Total</td>
<td>321</td>
<td>13.82</td>
<td>4.77</td>
<td>13.29</td>
<td>14.34</td>
<td>0.00</td>
<td>23.00</td>
<td>0.023*</td>
</tr>
<tr>
<td>Attitudes on doping</td>
<td>first year</td>
<td>89</td>
<td>38.91</td>
<td>15.57</td>
<td>35.63</td>
<td>42.19</td>
<td>17.00</td>
<td>73.00</td>
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</tr>
<tr>
<td></td>
<td>second year</td>
<td>112</td>
<td>33.90</td>
<td>13.78</td>
<td>31.32</td>
<td>36.48</td>
<td>17.00</td>
<td>67.00</td>
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</tr>
<tr>
<td></td>
<td>third year</td>
<td>120</td>
<td>34.41</td>
<td>12.55</td>
<td>32.14</td>
<td>36.68</td>
<td>17.00</td>
<td>74.00</td>
<td>3.798</td>
</tr>
<tr>
<td></td>
<td>Total</td>
<td>321</td>
<td>35.48</td>
<td>13.99</td>
<td>33.94</td>
<td>37.01</td>
<td>17.00</td>
<td>74.00</td>
<td></td>
</tr>
</tbody>
</table>

* p < 0.05
**p < 0.01
Table 5. Score comparison per habit of engaging in sports

<table>
<thead>
<tr>
<th>Scores</th>
<th>You are into sports as</th>
<th>n</th>
<th>x</th>
<th>SD</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>General knowledge of doping</td>
<td>first team member</td>
<td>19</td>
<td>11.36</td>
<td>1.89</td>
<td>0.43</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>recreationally active</td>
<td>248</td>
<td>11.19</td>
<td>2.66</td>
<td>0.16</td>
<td>0.274</td>
<td>0.784</td>
</tr>
<tr>
<td>Knowledge of doping side effects</td>
<td>first team member</td>
<td>19</td>
<td>13.10</td>
<td>4.40</td>
<td>1.01</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>recreationally active</td>
<td>248</td>
<td>13.59</td>
<td>4.87</td>
<td>0.30</td>
<td>0.423</td>
<td>0.673</td>
</tr>
<tr>
<td>Attitudes on doping</td>
<td>first team member</td>
<td>19</td>
<td>34.57</td>
<td>12.31</td>
<td>2.82</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>recreationally active</td>
<td>248</td>
<td>36.01</td>
<td>13.85</td>
<td>0.87</td>
<td>0.438</td>
<td>0.662</td>
</tr>
</tbody>
</table>

* p < 0.05  
**p < 0.01

Table 6. Score comparisons with regards to the question: Do you think that use of substances to improve efficiency in sports is unethical?

<table>
<thead>
<tr>
<th>Scores</th>
<th>Do you think that use of substances to improve efficiency in sports is unethical?</th>
<th>n</th>
<th>x</th>
<th>SD</th>
<th>SE</th>
<th>t</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>General knowledge of doping</td>
<td>Yes</td>
<td>250</td>
<td>11.42</td>
<td>2.57</td>
<td>0.16</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>69</td>
<td>11.01</td>
<td>2.87</td>
<td>0.34</td>
<td>1.153</td>
<td>0.250</td>
</tr>
<tr>
<td>Knowledge of doping side effects</td>
<td>Yes</td>
<td>250</td>
<td>14.19</td>
<td>4.70</td>
<td>0.29</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>69</td>
<td>12.59</td>
<td>4.88</td>
<td>0.58</td>
<td>2.478</td>
<td>0.014*</td>
</tr>
<tr>
<td>Attitudes on doping</td>
<td>Yes</td>
<td>250</td>
<td>30.18</td>
<td>11.31</td>
<td>0.84</td>
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<td></td>
</tr>
<tr>
<td></td>
<td>No</td>
<td>69</td>
<td>34.04</td>
<td>15.62</td>
<td>1.88</td>
<td>-3.115</td>
<td>0.002**</td>
</tr>
</tbody>
</table>

* p < 0.05  
**p < 0.01
Literature


Received on February 14, 2017.
Revised on May 03, 2017.
Accepted on May 11, 2017.
Online First May, 2017.