CONSUMPTION OF STIMULATING AGENTS IN SPORT

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Abstract: Nutrition is an extremely important factor for every person, especially those who do sports. Food provides the energy needed for growth, physical activity and other bodily functions. The needs of modern sports are increasingly including various dietary supplements in the diet of athletes. They are indispensable so that athletes can be adequately and better prepared for competitions and sports care in general. The aim of this research is to examine and determine the level of knowledge and attitudes of people from different spheres of society about the consumption of stimulants in sports. The sample of respondents consists of N = 1050 people from different spheres of society. For the purposes of this research, a survey questionnaire was constructed, which was conducted online. All data collected by the survey were processed by descriptive statistics procedures. Frequencies and percentages were calculated from the space of descriptive statistics. Out of the total number of respondents, 49.8% of respondents were engaged in recreational sports, of which a large number exercised in the gym or used to do sports. There were 25.8% of active athletes, while there were a total of 24.4% of those who do not do sports. 56.2% of respondents believe that stimulants are necessary only in professional sports. 22.7% answered that stimulants are necessary in modern sports, while 21.1% said that stimulants are not necessary in modern sports. Most respondents consume 445 proteins (43.3%) and 327 minerals (32.6%). Vitamins are used by 288 (28.7%), amino acids by 286 (28.5%), and herbal preparations by 68 (6.8%) respondents. All offered supplements are consumed by 100 (10%) respondents, while 68 (6.8%) use some other dietary supplements. 36.9% of respondents do not consume supplements at all, while daily consumers of dietary supplements make up slightly more than a quarter of respondents, 25.2% of them. As a source of information on the use of stimulants, they cite nutritionists (27.3%) in the first place, pharmacists (25.5%), doctors (21.6%), trainers (21.3%), and the media (18.3%) and some other persons (10.7%). 28.9% of them think that illicit preparations and stimulants are often used, and 18.5% do not think they are used. A total of 45.4% believe that the use of stimulants is necessary in achieving the desired sports results, while 38.8% state that stimulants are not necessary in sports. According to the answers, 15.9% of respondents do not have enough information on this topic. Knowledge and attitudes about the consumption of illicit stimulants in sports by ordinary people are generally limited, while athletes are much more familiar with this issue. However, modern dietary supplements that more and more people use as dietary supplements have shown that even people who are not in the world of sports have certain knowledge about illicit substances present nowadays.

Keywords: Different spheres of society, stimulants, sports, attitudes, knowledge.

INTRODUCTION

The needs of modern sports are increasingly including various dietary supplements in the diet of athletes. They are indispensable so that athletes can be adequately and better prepared for competitions and sports careers in general. Many scientists and sports workers overlook attitudes related to supplements, and view them differently. Some of them are not allowed for consumption, while others are an urgent need of athletes. Incentives give athletes a certain advantage in strength and endurance. There are more and more people in the world of sports with the attitude that various stimuli are necessary in achieving better sports results, and that as such they are widely used, especially in top sports. The desire for success often overcomes reason, so athletes resort to consuming illicit drugs and this is called doping (Tahiraj, 2015). Training and nutrition play a key role in achieving optimal sports results. Based on that, very significant effects can be achieved in improving training and sports achievements. Inadequate nutrition reduces the overall performance of the athlete, and especially the optimal mobilization of his biological abilities. Nutrition, hydration and recovery are part of the so-called invisible training that has a big impact on the sports result. Training and nutrition are closely related, because intensive training causes increased metabolic, physical and mental activity, and the energy needs of athletes are greater than the needs of people who are not actively involved in sports. The quality composition of food, the relationship between proteins, fats and carbohydrates, the need for vitamins and mineral salts largely depends on the specifics of various sports activities. Different types of effort and load in different sports require proper nutrition, each for itself. Optimal nutrition must take into account not only the specifics of a particular sport, but also the different stages of preparation and competition. These include the preparation period, the pre-competition period, the competition period itself and finally the recovery and regeneration period. It should be taken into account that an athlete who plays a sport in which endurance is the dominant factor requires a different diet than an athlete for whom strength is an important factor (Mikić and Ahmetović, 2006). The use of illicit substances in

sport falls under the category of doping, and sports regulators are taking steps to prevent it. Sports are regulated by rules, which include a ban on doping. The most famous of these is the World Anti-Doping Code, implemented by the World Anti-Doping Agency (WADA), which publishes a list of banned substances and methods, in order to "protect the fundamental right of athletes to compete in doping-free sports" and thus ensure "health, honesty and equality of athletes around the world "(WADA, 2019). The first name associated with the use of doping is Abraham Wood, who used opium in 1807 to stay awake for more than 24 hours, and managed to win by crossing 837 kilometers in 138 hours (Aleksić and Savić, 2015). The first proven sporting case of doping was recorded in 1864 at the Bordeaux-Paris bicycle race, using Trimetin. The first victim was cyclist Linton. The epidemic of modern doping today began just over two decades ago, in the 1950s, as a result of the unfortunate combination of the circumstances of the American hammer thrower Harold Connolly. He was later given paralysis, and due to stunted muscles, he was recommended to use the preparation dianabol as a young man. After taking the drug for a long time, the muscles began to develop rapidly, and Connolly won Olympic gold in Melbourne in 1956. That's how anabolics - through Connolly's Olympic gold - entered the sports field. They entered through a small door, and now they cannot be expelled in any way (Mikić and Ahmetović, 2006). The potential properties of stimulants in increasing athletic performance are based on their impact on the central nervous system and the ability to perceive fatigue. They increase alertness, boost self-confidence and stimulate the heart and blood flow to the trained muscles. They achieve this by increasing their secretion of neurotransmitters and activating their receptors. WADA lists over 60 substances with similar content in this category (Docherty, 2008). The Finnish weightlifter, Kangasnjemi, an Olympic ace and world champion by his own admission, was under emotional pressure for many years after he stopped taking anabolics, in serious psychological crises, in a severe depressive state, apathetic, anxious and irritable. Swedish wrestler Svenson felt similarly. These first dopings had great consequences, they also caused high blood pressure, headaches and urinary problems, and they also increased cholesterol levels. If these pills are taken in large quantities, instead of contraceptives, they become hormonal doping of unprecedented proportions that really improves sports results, but reduces most other things and causes negative and sometimes catastrophic consequences for the body (Mikić and Ahmetović, 2006). WADA highlights the results of 269,878 samples analyzed during 2013, of which 5,962 (2.21%) indicated "atypical findings". The relatively recent introduction of blood sample tests was made possible by a study conducted on 2737 athletes, mostly long-distance runners, who indicated that the prevalence of doping in blood (any method that increases red blood cell mass and increases oxygen transport) is 14% (Sottas, 2011). Violations of doping rules were also observed in Paralympic sports, in less than 1% of cases. When test results were positive, they were usually anabolic agents, and sports were mostly strength disciplines (Bird et al., 2016). At lower levels of competition, the prevalence of illicit substances is as follows: 43% anabolic androgenic steroids (AAS) and 12% growth hormone (hGH) or insulin-like growth factor (IGF-1) in young male weightlifters. It is estimated that 4-6% of male and 1.5-3% of female athletes have taken AAS over a period of time (Harmer, 2010). Long-term adaptations, such as structural and physiological changes in the skeletal muscles and cardiovascular system, increase the body's ability to cope with the demands of subsequent training and activities, for example through increased oxygen delivery and utilization capacity or increased contractile muscle protein. which they can accomplish. Such adaptations, ie improvements, enable a person to potentially reach higher levels of performance in subsequent trainings or competitions (Bird et al., 2016). The prevalence of doping can be determined by surveys or doping tests of athletes, but both methods have drawbacks. Survey data are limited by different definitions of doping and taking certain banned substances due to social reasons rather than reasons for improving sports performance (say cannabinoids), as well as unreliability in terms of honestly reporting one's own illegal behavior (Harmer, 2010). On the other hand, data obtained from clinical tests of blood or urine samples may underestimate the degree of doping if the time of sampling does not correspond to the time window in which the substance or its metabolites are present in the sample. The use of doping agents is not limited to competitive sports. They are widely used for aesthetic reasons and "body styling" for both younger and adult men and women. Because it is primarily about increasing muscle mass and reducing the proportion of adipose tissue, AAS are the most common. Cases in which the U.S. Drug Enforcement Administration (DEA) has seized millions of doses of steroids and hGH indicate widespread use of doping agents (Bird et al., 2016).

WORKING METHODS

The sample consisted of people of different ages and genders. A total of 1,050 people from different spheres of society were surveyed. The largest number of respondents came from the field of sports. Some are active athletes, and some play sports recreationally or have done so. Also, there were a number of people who were not active in any sport. The research was conducted in accordance with the recommendations of the Declaration of Helsinki and participation was voluntary

Table 1. The structure of the sample of respondents with regard to gender

Gender	Percentage (%)
Male	60,4
Female	39,6
Total	100,00

Table 2. The structure of the sample of respondents with regard to age

Age	Percentage (%)
15-20	12,6
20-25	36,9
25-30	29,3
Over 30	21,2
Total	100,00

The questionnaire consisted of two parts. In the first part, the socio - demographic characteristics of the research participants were examined, and in the second part, the respondents were examined about the consumption of stimulants in sports. For the purposes of this research, an online anonymous questionnaire was purposely formulated, consisting of 20 multiple-choice, closed-ended questions. All data collected by the survey were processed by descriptive statistics procedures. Frequencies and percentages were calculated from the space of descriptive statistics. The statistical program for personal computers SPSS for Windows-version 20.0 was used for data processing.

RESULTS

Table 3. Review of respondents' answers to the question: "Do you practice sports?"

Variables	Percentage (%)
Yes, actively	25,8
Recreationally	49,8
I don’t practice sports	24,4
Total	100,00

Table 4. Review of respondents' answers to the question: "Are you familiar with the consumption of stimulants in sports?"

Variables	Percentage (%)
Yes	37,6
No	29,7
Partially	32,7
Total	100,00

Table 5. Review of respondents' answers to the question: "Do you think that stimulants are necessary in modern sports?"

Variables	Percentage (%)
Yes	22,7
Yes, but only in professional sports	56,2
No	21,1
Total	100,00

Table 6. Review of respondents' answers to the question: "Do you use different supplements?"

Variables	Percentage (%)
Yes	50,0
No	50,0
Total	100,00

Graph 1. A review of the most widely used dietary supplements

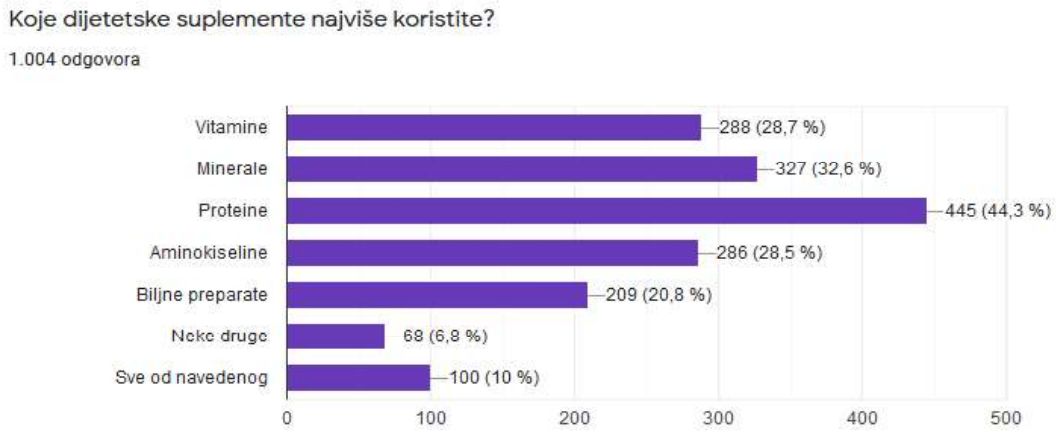

Table 7. Review of respondents' answers to the question: "How often do you use dietary supplements?"

Variables	Percentage (%)
Daily	25,2
2-3 times a week	37,9
Never	36,9
Total	100,00

Table 8. Review of respondents' answers to the question: "Have you had any side effects since using the supplements?"

Variables	Percentage (%)
Yes	31,5
No	68,5
Total	100,00

Table 9. Review of respondents' answers to the question: "Where do you get the supplements you use?"

Variables	Percentage (%)
Farmacy	25,4
I order online	32,8
At the gym	30,8
From my coach	11,0
Total	100,00

Table 10. Review of respondents' answers to the question: "What are the main reasons for using illicit stimulants in sports?"

Variables	Percentage(%)
Health promotion and dietary supplement	16,5
Energy boost	19,1
Weight loss or gain	21,2
Building muscle mass	15,0
Achieving better sports results	16,6
All of the above	11,5
Total	100,00

Graph 2. The most important sources of information on the use of stimulants in sports

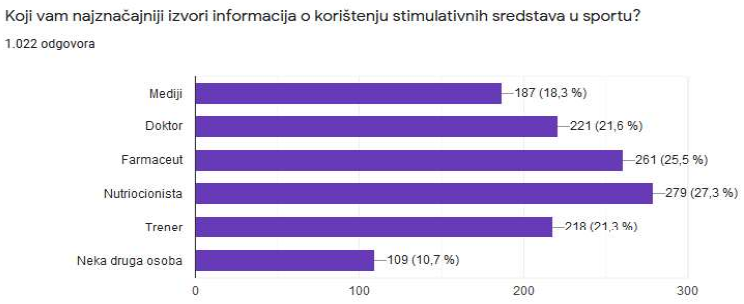

Table 11. Review of respondents' answers to the question: "Do you feel that you are sufficiently and adequately informed about the benefits and risks of using stimulants in sports?"

Variables	Percentage (%)
Yes	24,5
No	41,0
Partially	34,5
Total	100,00

Table 12. Review of respondents' answers to the question: "Are you familiar with the list of banned substances in sports?"

Variables	Percentage (%)
Yes	29,3
No	37,3
Not enough information	33,5
Total	100,00

Table 13. Review of respondents' answers to the question: "What is your opinion on penalties for those who have used doping or illicit stimulants in professional sports?"

Variables	Percentage(%)
Life ban	18,6
The first time a milder punishment, and the second time a life ban	34,4
Prohibition of participation in competitions for several seasons	33,0
Fines	9,9
It shouldn't be punished	4,1
Total	100,00

Table 14. Review of respondents' answers to the question: "Would you use illegal stimulants?"

Variables	Percentage (%)
If I knew they would be helpful	16,9
If I knew they would be helpful, and will not harm my health	47,7
I would not use it at any cost	35,5
Total	100,00

Table 15. Review of respondents' answers to the question: "Would you take an illicit substance or stimulant if you knew you couldn't be detected?"

Variables	Percentage (%)
Yes	34,7
No	65,3
Total	100,00

Table 16. Review of respondents' answers to the question: "How many times have you been tested for banned stimulants?"

Variables	Percentage (%)
Never	59,7
1-2 times	16,2
2-5 times	17,2
More than 5 times	6,9
Total	100,00

Table 17. Review of respondents' answers to the question: "Do you think that illicit preparations and stimulants are used in your sport in order to achieve the best possible result?"

Variables	Percentage (%)
I don't think they are used	18,5
I don't know if they are used	33,7
They are rarely used	28,9
They are widely used	19,0
Total	100,00

Table 18. Review of respondents' answers to the question: "Do you think that the use of stimulants is necessary in achieving the desired sports results?"

Variables	Percentage (%)
Yes	45,4
No	38,8
Lack of information	15,9
Total	100,00

DISCUSSION

Modern sport is demanding and conceived significantly differently from what it was twenty, thirty or fifty years ago. It requires a different training regime, but also a significantly improved diet with various stimulants and supplements that often exceed the allowable limit (Malacko and Rađo, 2004). The research, which was conducted among the respondents, provided answers to numerous questions about the understanding of athletes, but also people who do not play sports about consumption and general knowledge of the use of illicit stimulants. A total of 61% of respondents are male and 39% female. It should be noted that a larger number of men is mainly related to the fact that the survey is divided into several gyms where the ratio of men to women is approximately as on the question asked. Women are certainly an equal participant in the discussion of this topic, and some of them are also active athletes, and therefore more than competent.

The age structure of the respondents ranged from 15 years onwards. From fifteen to twenty years of age, there were 12.6% of respondents. The largest number of people who completed the questionnaire is between the ages of twenty to twentyfive. Statistically, 36.9% of them belong to this age group. Slightly less than one third or 29.3% of them are between twenty-five and thirty years old. Over thirty years, the survey participants were a total of 12.6%. These figures support the fact that the participants in the research were mostly younger people, and most of them are between twenty and thirty years old. There were 49.8% of recreational athletes, a large number of whom exercised in the gym or once did sports. There were 25.8% of active athletes, while there were a total of 24.4% of those who do not do sports. This set of respondents significantly redirected the results to the fact that they will be different, and that unanimity will not prevail. About the importance and necessity of stimulant means in modern sports, the respondents answered with 56.2% of answers that they are necessary only in professional sports. 22.7% of them answered that stimulants are necessary in modern sports, while slightly less, 21.1% said that stimulants are not necessary in modern sports. The answers to these questions should be sought in the fact that a certain number of respondents are not so well versed in the subject or stimuli and their role in general about sports. A similar study was conducted on a sample of respondents from 187 top athletes. The survey was conducted in sports such as table tennis, tennis and badminton. This research is interesting because all respondents were professional athletes, so the results were quite expected and predictable. The only difference was in the sports and the needs they required. Between 10% and 24% of male athletes surveyed would take doping if such a practice would allow them to achieve better results and not endanger their health, while between 5 and 10% of respondents would take doping regardless of the possible health consequences. The female part of the respondents was generally less oriented towards taking substances, with no difference between sports, except for badminton. 20% of respondents practice going out where alcohol and cigarettes are consumed. It has been found that athletes do not trust doctors and their coaches much when it comes to taking illicit stimulants (Kondrič et al., 2011). When asked about the use of dietary supplements, respondents were able to give more answers or choose some others or all that were offered. According to the survey, most respondents consume proteins and minerals, ie 445 (43.3%) and 327 (32.6%) of them. Vitamins are used by 288 (28.7%), amino acids by 286 (28.5%), and herbal preparations by 68 (6.8%) respondents. All offered supplements are consumed by 100 (10%) respondents, while 68 (6.8%) use some other dietary supplements. This issue is related to all active and recreational athletes, as well as ordinary people. Diet and the use of supplements are a very important factor in modern times when the pace of life is extremely fast and active. Regarding the use of dietary supplements, a larger number of respondents answered that they consume them two to three times a week. 36.9% of respondents do not take them at all, while daily consumers of dietary supplements make up slightly more than a quarter of respondents, 25.2% of them. About 31.5% of respondents had side effects from the use of supplements, while 68.5% of them used supplements without any side effects or problems. Adverse reactions could be reported by those who do sports, as well as recreational athletes, given that a significant number of them use various dietary supplements. About where they get supplements, respondents said that about 32.8% of them order from the Internet. Slightly less respondents take them in the gym, while 25.4% takes them in the pharmacy. The smallest number of respondents, 11% of them receive supplements from coaches. This is certainly about top and active athletes for whom the coach is a mentor and takes care of their diet. In his doctoral thesis, the author conducts research on the relationship of sociodemographic, health and sports predictors with doping factors in sports that require the application of high energy requirements, high technical requirements and high tactical requirements, was done in three studies. The sample of respondents consisted of a total of 293 athletes, who are older than 18 years. When the results were later compared, it was concluded that research shows that substance abuse in sports spreads beyond those that enhance sports performance such as high alcohol consumption. The research also showed that anti-doping tests are significantly advanced, and in the later period it will be much harder to remain negative in tests (Rodek, 2013). Respondents answered similarly and uniformly about the reasons for using stimulants in sports. 21.2% of them believe that the motive for using stimulants is related to the need to reduce or increase body weight. Here, in response, people who lose weight or go to the gym to gain weight can be seen. A total of 19.1% of respondents believe that stimulants are taken to increase energy, while 16.6% of them say that it is about achieving better sports results. The same statistic applies to the answer regarding health promotion and dietary supplementation. A similar study was conducted in London on a sample of a total of 346 athletes, of whom 28 were men and 138 women. The average age was 17 and most athletes were minors. They were respondents from different sports, and most of them played football. About 14% of athletes said they would take illicit stimulants to improve their success without being detected. 10% of them would use illicit stimulants in addition to control if it would bring them some success. This research proved that younger athletes are much more careless and ambitious, and their consumption of illicit drugs is more pronounced (Bloodworth & McNamee, 2010).

The use of drugs to improve physical performance and appearance has been observed for thousands of years. Today, individuals, including adolescents, continue to use a wide range of medications in hopes of improving their athletic performance and looking better. Unfortunately, other than evaluating the use of anabolic-androgenic steroids (AAS), very little is known about the use, safety, and efficiancy of other performance-enhancing drugs and dietary supplements in adolescents. Most studies tell us that 3-12% of adolescent men admit to using AAS at some point in their lives. Among adolescent women, studies reveal that 1-2% state that they have used steroids. In order to change the current use of drugs to improve performance in adolescents, we as a society must confront our dependence on sport and the importance we attach to victory and performance (Yesalis & Bahrke, 2000). According to the respondents, the most important source on the use of stimulants in sports is a nutritionist (27.3%), pharmacist (25.5%), doctor (21.6%), coach (21.3%), media (18.3%) and another person (10.7%). This question also belongs to the "universal" because almost all respondents were able to give a valid answer. Also, it should be emphasized that the respondents had multiple choices in this matter, and that rightly the pharmacist, doctor and coach have the most information on such topics. Respondents gave different answers in the questionnaire about sufficient information about the benefits and risks of using stimulants. 41% of them think that they are not familiar enough, 34.5% answered partially, while 24.5% answered YES. This last answer is probably about professional athletes. 29.3% of respondents are familiar with the list of banned substances in sports. 33.5% of them do not have enough information, while 37.3% of people are not familiar with illicit substances in sports. Penalties for doping are a daily occurrence in sports, and respondents answered these questions quite harshly. They mostly demanded rigorous punishments. 34.4% of them believe that consumers of illicit drugs should be punished after one violation with a milder punishment, and the second time with a life ban. Slightly less, ie 33%, believe that the relevant punishment is a ban on participating in competitions for several seasons, and 18.6% are of the opinion that athletes should be punished with a life ban. A fine was somewhat less represented as an answer, while an almost imperceptible answer was that athletes should not be punished. The issue of taking illicit stimulants was more related to those who play professional sports. The response was quite dominant and negative (NO). As many as 65.3% of them answered like this, while 34.7% of respondents answered in the affirmative (YES). Here it can be noticed that the desire to succeed and achieve a top sports result is ahead of fair play. It should come as no surprise that at all major sports competitions, top athletes are punished for doping. On the other hand, a total of 59.7% of respondents had never been tested for prohibited stimulants. 17.2% of them were tested 2 - 5 times, and 16.2% 1 - 2 times. A number of respondents have been tested more than five times and obviously these are top athletes. Sekulić et all. (2010) investigated the use of substances in 16 female and 9 male professional Croatian ballet dancers using an adequate survey questionnaire. All factors that include those activities outside of training were analyzed. The calculated frequency tables and rank correlation coefficients showed that one third of male dancers do not lead a healthy life and practice going out to places where alcohol and tobacco are consumed. In this survey, as many as 20% of women consume more than a pack of cigarettes a day. Almost 25% of dancers would use doping if it meant a successful ballet performance, regardless of the negative health consequences. In men, the risk of potential "doping" behavior increases with age, while in women the level of education is negatively associated with smoking, but positively with potential "doping" habits and behavior. The results indicate an evident need for more specific medical and/or psychological assistance in professional ballet. Similar research has been conducted by a number of authors. Former retired athletes took part in the research. They suggested that there were significantly fewer doping agents during their practice in sports, and those who took doping could hardly be detected unlike today. Current athletes who used a doping motive found it in the fact that they achieve the best possible result and that was the only reason (Erickson et al., 2016). Our research is significant because it offered a completely new approach in which the emphasis was placed on both active athletes and those who have completed their careers. 33.7% of respondents are not familiar with the use of preparations and stimulants in certain sports and think that they are not used. 28.9% of them think that illicit preparations and stimulants are often used, and 18.5% do not think they are used. The last question in the questionnaire referred to the use of stimulants, ie the necessity in achieving sports results. A total of 45.4% believe that the use of stimulants is necessary in achieving the desired sports results, while 38.8% state that stimulants are not necessary in sports. According to the answers, 15.9% of respondents do not have enough information on this topic. The research brought interesting results and is "universal" in that not only top athletes participated in this research, so at the beginning it should be noted that the answers were quite different. When it comes to understanding this topic, people have different views. They can often be attributed to the fact that many of them are not familiar with the consumption of illicit stimulants in sports.

CONCLUSION

Based on the conducted research, it is possible to make a clear conclusion about the knowledge and attitudes of people from different spheres of society about illicit

substances and their application in sports. Talking about this topic has long been marginalized, and those who have been victims of doping are usually stigmatized in society. However, lately, more and more people can read about this topic in the mass media, so that the respondents, some less, and some more are familiar with illicit substances and their application in sports. The answers we came to were expected given the concept of the questions asked and the different attitudes of the respondents. Among the respondents were active athletes and those who use some of the dubious stimulants for improved appearance and muscle mass development. The survey was also conducted in several gyms and sports clubs. In addition to athletes, people who did not have so much contact with illicit substances and some sports in general gave their views on this issue, so the quality of research is viewed from the angle of different attitudes and ideas that are explained in the discussion and results. That is why it is important to mention different data that were obtained because they represent a picture of thoughts and ideas of over a thousand respondents, so they can be used to accurately explain and see a clear attitude of people on this topic. Knowledge and attitudes about the consumption of illicit stimulants in sports by ordinary people are generally limited, while athletes are much more familiar with this issue. However, modern supplements, which more and more people use as dietary supplements, have shown that even people who are not in the world of sports have certain knowledge about illicit substances present nowadays.

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