

PREVALENCE AND PERCEPTIONS TOWARD ANABOLIC-ANDROGENIC STEROID USE AMONGST UNIVERSITY STUDENTS

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Summary. Anabolic-androgenic steroids (AASs) are highly sought-after in order to achieve muscle growth and better physical attributes. The study was conducted to measure the prevalence and attitudes towards the use of AASs among university students. 1008 male students from Isfahan University, Iran, between the ages of 18 and 25 years (23.3 ± 1.2 years) completed a questionnaire that investigated participation in bodybuilding, level of sport competition, participation in sports and recreational activities, AASs use, prevalence, knowledge among users, attitudes, as well as intent to continue using AASs in the future. 8% of respondents had used AASs and 6% currently use AASs. 71% of users believed using only a small amount of AASs or using AASs with anti-toxic drugs would not result in any harm, 10% indicated that AASs were harmless and 19% admitted to taking AASs despite knowing the adverse effects. 33% of respondents believed that they needed to use AASs to ensure athletic success and 26% believed that athletes should be allowed to use AASs without consequence. The prevalent use of AASs is a public health concern which implies that educational programmes at university level are needed to educate students about the adverse effects of AASs use.

Key words: attitude; drug abuse; prevalence; steroids; students

INTRODUCTION

The use of different ergogenic substances to increase one's athletic prowess has become a major problem worldwide [8, 18, 31] and is not only limited to professional athletes, but is also becoming more prevalent among amateur athletes, non-athletes and even university students to enhance athletic performance and/or physical appearance [3, 16, 31]. With a history of usage dating back as far as 88 years and once utilized only for their medicinal properties, anabolic-androgenic steroids (AASs) use has increased in recent times due to their anabolic (leads to increases in skeletal mass) and androgenic (masculinisation) qualities [1, 3, 8, 9, 17]. In athletes, AASs are utilized to enhance athletic performance and/or body composition and the International Olympic Committee has indicated that AASs are the substances most commonly found in samples tested positive for doping [4, 13, 26]. In turn, AASs are utilized in adolescents and young adults to increase physical size and body mass, in order to improve physical appearance [22, 31]. This is so since many young men, and media portrayals, advocate a muscular body as an attractive body [33, 34].

Although AASs have a proven effect on athletic performance and physical appearance, AASs use also results in adverse effects on the user. Such adverse effects include inter alia chronic acne problems, nutritional disorders, certain cancers, liver damage, dyslipidemia (specifically increases in low-density lipoprotein and decreases in high-density lipoprotein), hypertension, impaired spermatogenesis and even death [2, 5, 12, 15, 30]. Hence, it is imperative to create awareness among individuals, especially in the youth, against the use of AASs for athletic performance and physical appearance [24, 32].

Of growing concern is the increasing use of AASs in adolescents and young adults since several studies have reported that 1.4-12.0% of males and 0.5-2.9% of females in high-school have used AASs, with two-thirds of these users having already started using AASs from the age of 17 [13, 16, 23]. Similarly, it has previously been demonstrated that 1.1% of NCAA student-athletes in the United States of America make use of AASs [14]. In Jordan, it has been reported that 4.2% of collegiate students and 26% of athletes are current AASs users. The results of that study also indicated that one-third of the students began using AASs before the age of 15 years and that more than half of the athletes began using AASs between 15 and 18 years of age [35]. Interestingly, it has also been found that AASs are used more frequently among students in comparison to any other types of drug [23, 25, 27].

The presence of such serious threats to the health of the young, as well as a wide prevalence of AASs usage has compelled researchers to study the prevalence of these drugs and the level of awareness among users. In this regard, previous research has shown that athletes have no adequate information and pay little attention to the consequences [13, 16, 26], but this information may be limited especially in non-athletic student populations when compared to student-athletes.

The study was conducted to measure the prevalence and attitudes towards the use of AASs among university students

MATERIAL AND METHODS

Selection of subjects: Selected male subjects were students from Isfahan University, Iran between the ages of 18 and 25 years (23.3 ± 1.2 years). Isfahan University is one of the largest universities in Iran with students enrolled from various regions throughout Iran. Before administering the questionnaire, students were informed that their participation was completely voluntary and that all responses were confidential. Of the 1240 registered male students, 1008 (81%) students voluntarily participated in the present study and placed their completed questionnaires in a sealed container. The same coordinators administered the surveys to all students present during classes.

Questionnaire

The questionnaire consisted of 30 items with the first section consisting of 11 questions designed to obtain demographic information regarding age and academic level, as well as their participation in bodybuilding and level of sport competition [28, 37]. The second section investigated participation in sports and recreational activities, while the third section of the survey consisted of a series of questions that assessed AASs use, prevalence, knowledge among users, attitudes, as well as the respondent's intention to continue using AASs in the future.

Data analysis

Descriptive statistics such as percentage, mean, range and standard deviation were used. Independent t-tests were utilized to determine if any significant differences existed between undergraduate and postgraduate students with regards to knowledge, prevalence and attitude variables. Significance levels were set at $P \leq 0.05$. Data were analyzed using Version 21.0 of the Statistical Package for the Social Sciences (SPSS) software (Chicago, IL, USA).

RESULTS

Of the sampled 1240 registered male students offered the questionnaire, 1008 students voluntarily participated in the present study and returned their completed questionnaires, giving an 81% response rate. Sixty-six percent ($n = 164$) of respondents were found to be active in bodybuilding as a competitive and/or recreational sport. Of those respondents, 51% indicated that they had less than 6 months experience (Table 1). In addition, 68% ($n = 676$) indicated that they participated in a sport other than bodybuilding. Sixteen percent ($n = 160$) of respondents reported that they participated in a sport on at least a city level. Eight percent ($n = 84$) of respondents indicated that they had used at least one AASs during their lifetime, with 6% ($n = 56$) indicating that they currently use AASs. The most common AASs

used were Methane (methandrostenolone) (19.54%), Oxymetholone (marketed as Anadrol and Anapolon) (17.24%), Nandrolone (either as its decanoate ester, in the form of Deca-Durabolin, Eubolin or Retabolil, or phenylpropionate ester, in the form of Durabolin and Fenobolin) (16.09%), Testosterone (16.09%), Methandrostenolone (marketed as Dianabol) (9.20%) and Winstrol (Stanozolol) (8.04%).

Table 1. Bodybuilding experience of sampled Iranian university students (n = 1008)

Type of activity	N	Percentage
Without experience	344	34
Less than 6 months	336	33
6 to 12 months	92	9
1 to 2 years	136	14
2 to 4 years	56	6
More than 4 years	44	4
Total	1008	100.0

Respondents indicated that their major sources of information about AASs have been their friends (43%), athletic magazines (41%), the internet (30%), coach or athletic trainer (12%) and parents (12%). Seventy-one percent (n = 60 of the 84) of users believed using only a small amount of AASs or using AASs with anti-toxic drugs would not result in any harm to the user. Ten percent of respondents (n = 8) indicated that AASs were harmless, while 19% (n = 16) admitted to taking AASs despite being fully aware of the adverse effects. Interestingly, 52% (n = 524) also indicated that they had seen or currently see the adverse effects of AASs on users.

Forty-one percent (n = 412) of respondents indicated that they assumed that only professional athletes use AASs. Fifty-six percent of respondents believed that AASs aid in the improvement of athletic prowess, with 44% (n = 440) stated that the most common reason for the use of AASs is to increase the volume and muscle mass of the body. Thirty-three percent (n = 336) of respondents believed that they need to use AASs to ensure athletic success and 26% (n = 260) believed that athletes should be allowed to use AASs without consequence. Fifty-eight percent (n = 584) indicated that if they knew a drug or a supplement would not pose a health risk, they would use it. Forty-seven percent of users indicated that they had recommended AASs use to others and 63% indicated that they intended using AASs in the future. 52% (n = 524) of respondents indicated that they would use AASs if they were available to them. Of the respondents, 47% (n = 472) indicated that they have friends who use AASs.

Results indicated that no significant difference was found between undergraduate and postgraduate students with regard to knowledge, prevalence and attitude ($P = 0.07$). However, a significant difference was found between those competed at a higher level than those who did not participate competitively ($P = 0.001$). In this regard, those respondents who competed were significantly higher with regards to knowledge and prevalence, but not to attitude ($P < 0.05$).

DISCUSSION

Anabolic-androgenic steroids (AASs) are considered to be a widespread public-health problem and they are commonly used to improve aesthetic appearance and strength in both athletic and non-athletic populations [11]. The abuse of these substances is associated with psychiatric side effects such as affective symptoms, loss of impulse control, aggression and suicide. Somatic adverse reactions of AASs abuse include disturbances in the lipid profile, cardiovascular effects, dermal manifestations and endocrine adverse reactions [11].

The present study revealed that 8% of university students used AASs and that this was higher when compared to previous studies, which have reported AASs use as low as 1.1% [7]. The prevalence of AASs use in different populations of varying nationalities or countries has become a prominent research area in an attempt to determine the cause for the use of such AASs. In the United States of America, it has been found that 5.4% of high-school male respondents and 3.9% of female respondents used AASs [19], with reports of AASs use being as high as 27% in high-school boys and girls [10]. In Sweden, it has been found that 3.6% of 16- to 17-year-old male and 2.8% of female respondents were found to be using AASs [29], whereas in Jordan, 4.2% of university students and 26% of collegiate athletes were found to be using AASs [35].

Given that the vast majority of respondents would not admit to misusing androgenic anabolic steroids, it is safe to hypothesize that the actual percentage is significantly higher. In addition, it has previously been asserted that AASs use is more prominent among athletes, and less so among non-athletes [1, 9], a finding which is supported by the present study. In this regard, it has previously been found that up to 78% of competitive and professional athletes make use of AASs [31, 36].

The AASs most commonly used in the present study were Methane (methandrosthenolone), Oxymetholone, Nandrolone, Testosterone, and Methandrosthenolone (marketed as Dianabol). The findings regarding Oxymetholone and Nandrolone are not surprising since these AASs are considered widely available globally [24, 25, 27].

The average reported number of knowledge in this research of 13.8 can be considered low with attitudes and beliefs lacking any scientific basis, especially when considering the education level of the subjects. Although this finding is unique in this population of university students, it has previously been found that athletes consider themselves as specialists in the use of AASs and subsequently pay less attention to the adverse effects of such use [21]. The finding that users in the present study obtained the majority of their information from non-scientific sources (i.e. friends, athletic magazines, internet, coach or athletic trainer and parents) is a concern and is similar to previous findings [6, 20].

CONCLUSION

The findings of the present study, and that of the previous studies, indicates that although efforts should also be expanded to prevent access to AASs, there is a need for population-specific, AAS-targeted prevention programmes that focus on

the adverse effects of AASs use since an increase in education level has no effect on AASs perception, knowledge and attitude.

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