

Full Length Research Paper

Anabolic drugs consumption of high school students participating in school championships of physical education

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This paper aims to analyse the use of anabolic drugs among Greek students participating in school championships of physical education (PE). In order to do it, a survey was conducted during the 2008 to 2009 academic year in suburban, urban and metropolitan areas in Greece. The sample was 2,535 high school students from the 10 to 12th grade, participating in the school physical education championships. The results showed that 9.6% of boys and 3.7% of girls reported that they had used anabolic drugs sometime in the past whereas 11.2% boys and 4.8% girls reported that they would intend to use them in the future. This confirms that anabolic steroids are an important problem among adolescents, and educational programs should increase their knowledge about these drugs. Information should come not only from the state, but also from coaches, teachers, trainers and parents.

Key words: Greece, athletics, anabolic steroids, adolescents, boys and girls.

INTRODUCTION

Anabolic steroid consumption often starts in adolescence (Alongi et al., 1995; Anderson et al., 1988; Bahrke et al., 1993; Chillag et al., 1992; DuMitru and Windsor, 1989; DuMitru et al., 1992; DuRant et al., 1995a; Escobedo et al., 1995), and this represents a serious problem. Some studies indicate that approximately two-thirds of the users of steroids normally start by the age of 17 (Broderick et al., 1993; Johnson, 1990).

Adolescents are clearly a population at risk, as they normally do not have accurate information about the risks of this kind of drugs. They might use these substances seeking higher performance without worrying or even knowing about their negative effects. Prevalence of anabolic steroid usage has historically been higher in athletes than in non-athletes (Tanner et al., 1995). This is

the reason why it is important to know the attitudes of high school students participating in physical education (PE) championships towards anabolic steroids.

Former studies confirm that consumption in this sector of the population -adolescents-ranges from 1 and 12% for boys and from 0.5 and 2.9% for girls (Alongi et al., 1995; Anderson et al., 1988; Bahrke et al., 1993; Broderick et al., 1993; Chillag et al., 1992; DuMitru and Windsor, 1989; Dumitru et al., 1992; DuRant et al., 1995a,1997; Escobedo et al., 1995; Wroble et al., 2002).

Regarding students' motivations to participate in school championships, they might be either internal -personal pleasure and satisfaction or external obligation (Deci, 1975; Deci and Ryan, 1985; Sáez, 2008). In case those motivations are external, the students might have some pressure to get good results, and they might be even in a riskier situation in which falling in the temptation of using steroids is easier.

Previous studies (Dumitru et al., 1992) reported that when adolescent users were questioned about their

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motivation to use anabolic steroids, 64% stated to increase their strength; 48% to increase their size; 44% to improve their physical appearance and 17% because their peers were users. Gray (1990) indicates that, in general, they might use steroids to enhance performance.

Physical education at school promotes the physical and mental health of the students, and therefore, must play an important role in adopting healthy and moral attitudes and behaviors (Quennerstedt, 2008). The students' participation in the physical education tournaments becomes a key tool to teach them about those healthy attitudes.

The students practicing sports might benefit from athletics in several ways, such as better academic performance (Barron et al., 2000; Howell et al., 1984; Troutman and Dufur, 2007; Keays and Allison, 1995), improvement of their mental well-being (Greenleaf et al., 2009), increase in productivity (Cornelißen and Pfeifer, 2007), decrease of the stress levels and depression and increase of their sense of mental euphoria (Cai, 2000; Balady, 2000) or even a reduction in the level of negativity and suicide tendencies (Talliaferro et al., 2008). But this situation is changing when those adolescents use steroids. In these cases, they tend to show high-risk behaviors and are more likely to use some other illicit drugs and practice unprotected sex (Ashworth et al., 1993; Chillag et al., 1992; DuRant et al., 1995a, 1995b).

The purpose of this study is to examine the rate of anabolic drugs consumption in adolescents who participate in school competitions of physical education in Greece.

MATERIALS AND METHOD

Participants

The survey was addressed to 2,535 students (1,182 boys, 46.6% and 1,353 girls, 53.4%), from the 10 to 12th grade, from 15 to 18 years old in 16 high schools, in suburban, urban and metropolitan areas, in 8 prefectures of Greece, during the 2008 to 2009 academic year.

From the total number of participants, 42.8% had not participated in any school championship before.

Instrument

The study utilized demographic questions, such as the students' gender, their place of residence, the school and the class they were attending, if they had participated or not for the first time in a school championship, if they were members of an athletic club and in which sport. The students were also asked if they believed that the state policy (incentives and point-bonus) was leading them to the right direction or, if it created a tense level of competition and promoted the use of unfair practices among students to achieve victory by all means. The questionnaire also included two more questions about the use or not of anabolic by students in the past or any intention of using them in the future, in order to get success in the school championships.

Procedure

The PE school tournaments where students of junior high and high school participate in Greece, and was carried out according to norms of the Greek Ministry of Education and are conducted in 4 phases as follows: phase A: in-campus championship, phase B: local school championship, phase C: inter-regional games and phase D: National Greek games. The students are trained and compete under the instruction of their schools' PE teachers within their schools' timetable, as that is part of the schools' duties. Students (boys and girls) of the champion teams of all sports in national level receive considerable "entrance-points" for their enrollment in higher education (colleges and universities). This is an important reason why the final phase (D) of the competition among the teams is tough. This distracts them from their basic goal which should be the participation per se and the "fair play".

During the early stages of the tournament (A and B phase), the feeling of entertainment and fun prevails, because most students seek relaxation, participation and social interactions (making new friends). But as they progress, (C and D phase) and as the number of participants is reduced due to the qualification system, winning is the higher goal, to enjoy the privileges awarded to the winners (state benefits) and to achieve a greater social acceptance and recognition.

One of the difficulties of this kind of survey with adolescents under 18 years is the achievement of permissions to perform it. This is why in this case the survey was conducted after receiving the permission by Ministry of Education. Parental permission was also necessary and so it was collected before distributing the questionnaires.

A total of 2,600 questionnaire forms were distributed by the authors during the different phases of the school tournaments (A, B, C and D phases) as they were held during the academic year 2008 to 2009 in schools as well as in fields or courts where the games were to take place, before they started. The residence area of the students and the schools attended were chosen with the method of random sampling, in a representative sample of students.

After the students were given instructions on how to complete the questionnaire, appropriate explanations and answers were provided. The questionnaires were anonymous and their completion time was about 15 min.

The researchers informed the students that their participation was completely voluntary and the received answers would be used for research purpose.

Finally, 2,535 valid questionnaires were collected. The quantitative data were analyzed using SPSS version 15.0. A descriptive analysis and Chi-squared tests were used to determine statistical significance where appropriate.

RESULTS

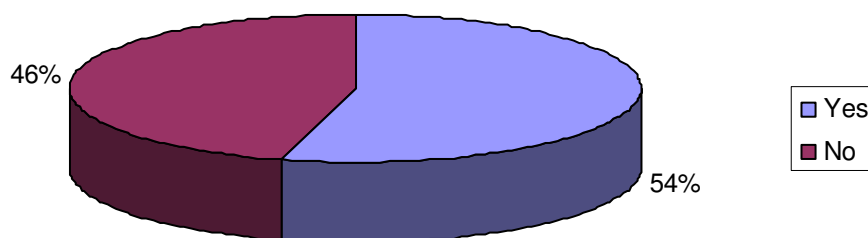
The results show that out of the 2,535 participants who completed the questionnaire, 54.8% were boys and 45.2% girls, being this statistically significant ($P < 0.001$). Strong differences ($P < 0.001$) were also found in relation with participation and place of residence, with a high percentage of participants coming from suburban areas, but no significant differences were found regarding social class levels.

More students took part in team sports (46.4%) than in individual sports (8.6%). Among team sports, football had the highest participation rate in boys (17.1%), while in girls, it was volleyball that reached the first place (15.3%). In individual sports, the greatest percentage for both boys

Table 1. Use of steroids by adolescents participating in Greek PE championships.

	Have used steroids (%)	Have never used steroids (%)	Would use steroids in the future (%)
Boys	9.6	91.4	11.2
Girls	3.7	97.3	4.8

Are the State policies on steroids going in the right direction?

**Figure 1.** Adolescents' opinion on the State policies regarding steroids consumption.

and girls was noticed in track (4%), followed by swimming (1.7%). At the same time 38.0% of students were also active members in sports clubs, whereas 62.0% were not.

Regarding the use of anabolic drugs, 9.6% of boys and 3.7% of girls reported that they had used them sometime in the past, whereas 11.2% boys and 4.8% girls reported that they would intend to use them in the future (Table 1).

Finally, 68% of the participants believe that the state initiatives giving some preference to enter in the university to students achieving points in these championships create fierce competition and promote the use of unfair means among students for achieving victory in all costs. Although, 54.2% of them said that the state policies were leading them to the right direction (Figures 1 and 2).

DISCUSSION

This study was undertaken to examine the use of anabolic drugs by 15 to 18 year old students participating in Greek School Championships, and also some of their attitudes towards the state policies in relation with physical education school championships. As regards the 6.4% (9.6% boys and 3.7% girls) of students who used anabolic drugs in the past (in order for their team to win in the school games, although they knew about their harmful effects), it seems to be higher than in other countries. In U.S.A., for example, in the last two decades, the respective numbers only rose to those levels in some

special circumstances and years (Alongi et al., 1995; Anderson et al., 1988; Bahrke et al., 1993; Broderick et al., 1993; Chillag et al., 1992; DuMitru and Windsor, 1989; Dumitru et al., 1992; DuRant et al., 1995a; DuRant et al., 1997; Escobedo et al., 1995; Wroble et al., 2002). The higher percentage of males using steroids is also in line with previous studies analysing the beliefs of other groups of age such as pre-adolescents (Wroble et al., 2002), and shows a tendency towards greater risk-taking behaviours in all males below 18 years old.

Regarding the state's inducements for students to participate in school championships, only half of the respondents (54.2%), said that they were leading the students to the right direction. This point of view is further enhanced by the significantly high percentage (68%) of students who stated that these inducements encourage the use of unfair practices among students only to achieve victory, in any possible way. It is transparent through these answers that most of these students disagree with the particular policy, because it does not promote fair competition, nor the mass participation which are the most essential and initial goals of school and especially, the lesson of physical education.

Finally, number one in the students' preferences came the state's policy inducements-bonus points (35.5%), since students see in that option a way out for their entrance to colleges and universities. This is an external motivation that could jeopardize future participation in physical activity of subjects and, therefore, calls into

Do the State initiatives create fierce competition and promote the use of unfair methods?

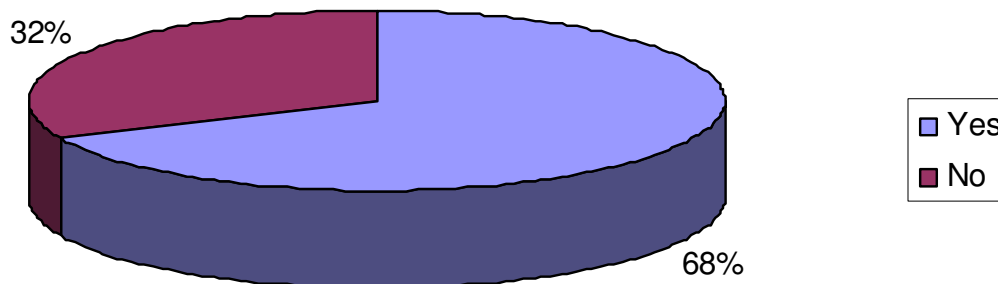


Figure 2. Adolescents' opinion on the State initiatives giving preference to enter in the university to students achieving points in PE championships.

question the school championships program itself.

These apparently contradictory results, together with the high values obtained for the questions regarding the intention to use steroids in the future, show the need of starting a state policy of prevention and information for this age group. Educational resources should be available to a larger number of students than now. The belief of Greek adolescents that their performance could improve with those illicit methods increases the risk of consumption, and perhaps makes necessary a rethinking of the development of school sports championships in Greece.

In 2002, only 64% of pre-adolescents had had steroid side effects explained to them (Wroble et al., 2002). Almost a decade after, the situation in a developed country like Greece remains unchanged or is, perhaps, even worse, as those pre-adolescents have become adolescents.

In his age, inappropriate sources of information on anabolic steroids were available to them, and the possibility to experiment with something they do not understand is even higher than when they end adolescence. So, it is crucial that they have sufficient knowledge in order to avoid this problem. The situation then is not acceptable and makes convenient to start information campaigns about the risks of this practice. Not only the government, but also parents, coaches, teachers and any other professionals in touch with adolescents need to take a more active role in this education (Cordente et al., 2008).

The most important limitation of this study is that the survey was only conducted in Greece. Each country has a different policy regarding steroids, being more or less flexible, so results could be different if it was conducted in a different country.

Conclusion

Even though steroid consumption rate is not very high among adolescents, their belief that it would increase their levels of self-efficacy is quite dangerous and it is a serious problem. It has been demonstrated that participants in Greek PE School Championships rate is very high.

The "good" effects of steroids in relation with their performance, even without having used them, and perhaps this is the main problem: the lack of real and complete information about the negative effects which creates inappropriate attitudes towards the use of anabolic steroids.

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REFERENCES

- Alongi C, Miller DW, Tanner SM (1995). Anabolic steroid use by adolescents: prevalence, motives, and knowledge of risks. *Cl. J. Sport. Med.*, 5: 108-115.
- Anderson WA, Buckley WE, Friedl KE, Streit AL, Wright JE, Yesalis CE (1988). Estimated prevalence of anabolic steroid use among high school seniors. *J. Am. Med. Assoc.*, 260: 3441-3445.
- Ashworth CS, DuRant RH, Newman C, Rickert VI, Slavens G (1993). Use of multiple drugs among adolescents who use anabolic steroids. *New Engl. J. Med.*, 328(13): 922-926.
- Bahrke MS, Kennedy NJ, Kopstein AN, Yesalis CE (1993). Anabolic-androgenic steroid use in the United States. *J. Am. Med. Assoc.*, 270: 1217-1221.
- Balady G (2000). ACSM's guidelines for exercise testing and participation.

- 6th ed. Philadelphia: Lippencott Williams and Wilkens.
- Barron JM, Bradley TE, Waddell TG (2000). The effects of High School athletic participation on education and labor market outcomes. *Rev. Econ. Stat.*, 82(3): 409-421.
- Broderick P, Pickell G, Radakovich J (1993). Rate of anabolic-androgenic steroid use among students in junior high school. *J. Am. Board Fam. Pract.*, 6(4): 341-345.
- Cai S (2000). Physical exercise and mental health: A content integrated approach in coping with college students' anxiety and depression. *Phys. Educ.*, 7(2): 69-76.
- Chillag S, Elliot D, Whitehead R (1992). Anabolic steroid use among adolescents in a rural state. *J. Fam. Pract.*, 35(4): 401-405.
- Cordente CA, García Soidán P, Sillero M (2008). Have parents responsibility in their children current and future health?, 1: 36-48.
- Cornelißen T, Pfeifer C (2007). The impact of participation in sports on educational attainment. IZA discussion paper avail. Soc. Sci. Res. Network.
- Deci EL (1975). *Intrinsic motivation*. New York: Plenum.
- Deci EL, Ryan M (1985). *Intrinsic motivation and self-determination in human behavior*. New York: Plenum.
- Dumitru D, Windsor R (1989). Prevalence of anabolic steroid use by male and female adolescents. *Med. Sci. Sport. Exerc.*, 270: 494-497.
- Dumitru D, Komoroski EM, Rickert VI, Windsor R (1992). Adolescent body image and attitudes to anabolic steroid use. *Am. J. Dis. Child.*, 146: 823-828.
- DuRant RH, Escobedo LG, Heath GW (1995a). Anabolic-steroid use, strength training, and multiple drug use among adolescents in the United States. *Pediatrics*, 96: 23-28.
- DuRant RH, Emans SJ, Faulkner AH, Middleman AB, Woods ER (1995b). High-risk behaviors among high school students in Massachusetts who use anabolic steroids. *Pediatrics*, 96: 268-272.
- Durant RH, Middleman A, Faulkner A, Emans J, Woods E (1997). Adolescents anabolic-androgenic steroid use, multiple drug use, and high school sports participation. *Pediatr. Exerc. Sci.*, 9: 150-158.
- Gray M (1990). Anabolic steroid survey: study group - 10 to 14 year-old youth sports participants. Dissertation at American College of Sports Medicine, Salt Lake City, Utah.
- Greenleaf C, Boyer E, Petrie T (2009). The mediating influences of body image, physical competence and instrumentality. *Sex Roles*, 61: 714-726.
- Howell FM, Miracle AW, Rees R (1984). Do High School Athletics pay?: The effects of varsity participation on socioeconomic attainment. *Sociol. Sport J.*, 1: 15-25.
- Johnson MD (1990). Anabolic steroid use in adolescent athletes. *Pediatr. Clin. N. Am.*, 37: 1111-1123.
- Keays J, Allison R (1995). The effects of regular moderate to vigorous physical activity on student outcomes: A review. *Can. J. Public Health*, 86: 62-65.
- Quennerstedt M (2008). Exploring the relation between physical activity and health, a salutogenic approach to physical education. *Sport Educ. Soc.*, 13(3): 267-283.
- Sáez Rodríguez G (2008). Motivation in different levels and categories in team Sports, 1: 19-29.
- Talliaferro L, Rienzo B, Miller D, Pigg M, Dodd V (2008). High school youth and suicide risk: exploring protection afforded through physical activity and sport participation. *J. School Health*, 78(10): 545-553.
- Troutman K, Dufur M (2007). From high school jocks to college grads: Assessing the long-term effects of high school sport participation on females' educational attainment. *Youth Soc.*, 38(4): 443-462.
- Wroble RR, Gray M, Rodrigo J (2002). Anabolic steroids and pre-adolescent athletes: prevalence, knowledge, and attitudes. *Sport J.*, 5(3): 1-8.