OPEN ACCESS
Saudi Journal of Medicine
Abbreviated Key Title: Saudi J Med
ISSN 2518-3389 (Print) |ISSN 2518-3397 (Online)
Scholars Middle East Publishers, Dubai, United Arab Emirates
Journal homepage: https://saudijournals.com/journal/sjm/home

Original Research Article

Prevalence, Knowledge, Attitude and Practice of Anabolic Androgenic Steroids Use among Adults Male Fitness Centre Attendees in Bahrain

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DOI: 10.36348/sjm.2019.v04i07.013 | **Received:** 20.07.2019 | **Accepted:** 27.07.2019 | **Published:** 30.07.2019

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Abstract

Anabolic Androgenic Steroids (AAS) are being used widely by athletes and gym attendees to augment their physical appearance and enhance performance. The abuse of AAS has serious and irreversible health risks. ***Objective:*** To estimate the prevalence of AAS use, assess the knowledge, attitude, practice and describe the associated factors of AAS use to improve the general health of adult male fitness centres attendees. ***Design*****:** Cross Sectional Study. ***Setting*****:** Fitness centres in Bahrain. ***Method:*** A total of 235 fitness centres were obtained and only 94 fitness centres met the inclusion criteria. Adult males aged 18-65 years old who attended fitness centres during October 2017 were targeted. Self-administered questionnaires were distributed among 20 randomly selected fitness centres covering the 4 governorates. ***Result:*** Four hundred forty six males were included. The prevalence of AAS use was 14.6%, the highest result was 26.4% found in Muharraq governorate. The majority of AAS users were Bahrainis (17.8%) and aged 30–39 years old (17.9%). Both AAS users and non-users had low knowledge score. Regarding the harmful effects of AAS, 18% of AAS users thought AAS use is bad for health. The most common route of AAS use was the combination of injectable and oral route (63.5%). Significant association was found between AAS use and the use of other supplements such as growth hormones, proteins and amino acid, smoking and energy drink consumption (P=0.05)
Conclusion: This is a pioneer study conducted in Bahrain that showed a lower prevalence of AAS use than other studies reported in the area and will allow further studies to expand on this topic. The lack of knowledge about AAS can be limited by spreading awareness of AAS harmful effects. We recommend strict control of black markets and imposing sanctions.

Keywords: Anabolic, Fitness Prevalence.

INTRODUCTION

Anabolic Androgenic Steroids (AAS) are human synthesized derivatives of testosterone. AAS have anabolic effects like increase in growth of muscle mass and bone strengthening, and androgenic effects such as enhancement in male sexual characteristics which include voice deepening, hair growth and increase in aggressiveness [1-3].

Since the early 1950's, these drugs have been used for their non-clinical effects by many body builders and athletes [1]. Recently the use of AAS has expanded to include young adolescents attending fitness centers[4].

The consequences of this non-medical usage are serious such as; high blood pressure, cardiac ischemia, hyperlipidemia, cirrhotic liver disease, infertility, severe acne, testicular atrophy, reduction in sperm count, increase risk of prostate cancer and significant psychological disturbances such as increase in aggression, mood swings and depression[4].

The abuse of AAS has been a major issue on an international scale. In Germany, a study was conducted during 2005 showed that 13.5% of fitness centre members have used AAS at least once in their lifetime [5]. Another study was done during 2014 in Brazil, showed the prevalence of AAS use was 20.6% among bodybuilders [6].

In the Arabian Gulf region, a study was conducted in the United Arab Emirates during 2008, estimated the prevalence of AAS misuse was 22% [4]. In Kuwait; a study was done during 2015 that showed the prevalence of AAS use was 22.7% with the highest

occurrence among the age of 19-25 years old. Of those participants 70.5% believed that having an optimally muscular body could only be achieved by using AAS and 6.8% believed that AAS usage would have significant harms to health, while 18.2% had appropriate knowledge about AAS side effects [1].

In Kingdom of Saudi Arabia – Riyadh, a study was conducted during 2015 showed the prevalence of AAS use was 30.5% and 20% of the users believed that there are no side effects of using AAS [7].

The abuse of steroids has been a concern to societies and governments worldwide; that includes The World Health Organization (WHO) and The International Olympic Committee (IOC), the latter has begun the fight against doping since 1960s. There has been collaboration between the IOC and the World Anti-doping Agency (WADA) to fight against doping since 1999[8].

In Bahrain, according to the National Health Regulatory Authority (NHRA) - the pharmaceutical regulations department, steroids cannot be given without a doctor's prescription in governmental and private pharmacies. Any breech of the NHRA regulations, will lead to legal accountability [9].

Considering the increased interest in bodybuilding, the exploiting of AAS use and the lack of studies regarding this issue in Bahrain, this study was conducted to investigate the prevalence, knowledge, attitude and practice of Anabolic Androgenic Steroid use among male fitness centre attendees in Bahrain with the aim of improving the overall general health of fitness centres attendees.

METHOD

Study design and population

This is a cross sectional study that involved adult males aged 18 to 65 years old who attended fitness centres in Bahrain during October 2017. Those who cannot read or write in Arabic or English were excluded.

Sampling techniques

A total of 235 fitness centres and clubs were obtained from the websites of Ministry of Industry, Commerce and Tourism (MOICT) and Central Informatics Organization (CIO). Female gyms, personal trainer studios, hotel and resorts facilities, inactive gyms, missed labelled facilities, health clubs that belong to universities, ministry of interior and military were excluded. As a result, 94 fitness centres met the inclusion criteria. The fitness centres were divided according to their location within the four governorates (South, North, Capital and Muharraq). The fitness centres were assigned numbers and five fitness centres were selected randomly from each governorate by a computerized program. Each fitness centre's manager was contacted to obtain consent of participation in the study. Sealed envelopes containing the questionnaires were distributed conveniently among the members.

Sample size calculation

The sample size was calculated using both the simple random and multi-stage random sampling equation. The calculated sample size was 405. To ensure accuracy, the sample size was increased to 450 participants [1, 10].

Instruments/measures

A self-administered questionnaire was obtained from a previously published Kuwaiti study after obtaining the approval [1]. The content validity of the questionnaire was reviewed and assured by a group of experts in the field of sports medicine, statistics, MD researcher, physiotherapist and certified trainer. A pilot study was conducted among 15 participants to ensure clarity and readability of the questionnaire in both Arabic and English versions.

The questionnaire is composed of 5 sections: 8 demographical data questions, 3 questions about prevalence, 3 questions regarding knowledge, 10 questions regarding attitude and 6 questions regarding practice of AAS. It consists of tick-boxes, close-ended and multiple choice questions. The participants who scored less than 7 in the knowledge question regarding adverse effects of AAS use (either wrong answer or "I don't know" answer) were considered as having low score. As for those who scored 7 and above were considered as having a higher score [1].

Data entry and analysis

Data was entered and analysed using Statistical Package for the Social Sciences SPSS software (version 23). Percentages of the results were calculated using the 95% confidence interval. P-value of less than 0.05 was considered statistically significant. Chi-square and t-test were used.

Ethical consideration

A written consent letter was sent to the managers of the fitness centres to explain the purpose of the study and assure confidentiality. As for the participants, a formal consent was taken prior to answering the questionnaire and a unique serial number was given to each questionnaire to maintain participants' confidentiality.

RESULTS

A total of 451 males attending the fitness centres in Kingdom of Bahrain participated in this study. Among the participants, five did not complete the essential questions of the questionnaire and were excluded. Therefore a total of 446 participants were included. The highest response rate was from the southern governorate (28%). The majority of the

population was below the age of 50 years old, 79% of them were Bahraini. Most of the participants were highly educated (graduated from university (64.4%)) and 83.1% were employed. Regarding life style habits, 41.8% were smokers and 25.4% consumed energy drinks (Table 1). In this study, there was no statistical significant difference between AAS users and non-users regarding the age, nationality, monthly income, educational level, marital and employment status (Table 2).

Table-1: Sociodemographic characteristics of the participants
Values are numbers (%), n = 446

		(n) (%)
Age	<30	211 (47.5%)
	30-39	165 (37.2%)
	40-49	52 (11.7%)
	50+	16 (3.6%)
	Total	444 (100.0%)
Nationality	Bahraini	350 (79.0%)
	Non - Bahraini	93 (21.0%)
	Total	443 (100.0%)
Employment Status	Employed	368 (83.1%)
	Unemployed	75 (16.9%)
	Total	443 (100.0%)
Monthly income	<500	53 (21.1%)
	500-999	111 (44.2%)
	1000-1999	64 (25.5%)
	2000+	23 (9.2%)
	Total	251 (100.0%)
Marital Status	Single	238 (53.5%)
	Married	195 (43.8%)
	Divorced	12 (2.7%)
	widower	0 (0.0%)
	Total	445 (100.0%)
Education Level	Primary School	2 (0.5%)
	Intermediate School	24 (5.4%)
	Secondary School	96 (21.6%)
	Institution/ Academy	36 (8.1%)
	University	286 (64.4%)
	Total	444 (100.0%)
Governorate	Capital	111 (24.9%)
	Muharraq	93 (20.9%)
	Northern	117 (26.2%)
	Southern	125 (28.0%)
	Total	446 (100.0%)
Smoking status	Yes	179 (41.8%)
	No	249 (58.2%)
	Total	428 (100.0%)
Drinking energy drinks to enhance performance	Yes	108 (25.4%)
	No	227 (53.4%)
	Sometimes	90 (21.2%)
	Total	425 (100.0%)
Values are missing for the monthly income (n=195)		

Prevalence and intention to use AAS

The number of AAS users in the past 12 months was 65 out of 446 participants resulting in a prevalence of 14.6%. The highest result was 26.4% found in Muharraq governorate (P=0.025) (Table 2). From the overall study population, 14.9% were considering using AAS in the future, while 67.3% were not and 17.8% were indecisive.

Knowledge

More than half of AAS users (57.8%) believed that they have enough information about AAS. Friends were found to be the main source of information of AAS (63.6%), followed by the internet (54.3%), both social media and coaches had equal results (33.7%). On examining the knowledge of the AAS harmful effects, a low score (less than 7 out of 13) was found in 14.2% of AAS users and 21.1% had high score (P=0.082).

Use of other supplements

The usage of other supplements (e.g. growth hormone, creatine, hormone stimulant, amino acids, proteins and fat burners) was found to be significantly high among AAS users (P<0.05). The highest product consumed was protein supplements (80%) followed by amino acids supplements (75.4%).

Table-2: Demographical data characteristics of AAS users and non-users

		Users (n) %	Non-users (n) %	Chi-Square P-value
Governorate	Capital	16 (16.8%)	79 (83.2%)	**0.025**
	Muharraq	23 (26.4%)	64 (73.6%)	
	Northern	14 (13%)	94 (87%)	
	Southern	12 (11.3%)	94 (88.7%)	
Age	<30	32 (17.7%)	149 (82.3%)	0.294
	30-39	27 (17.9%)	124 (82.1%)	
	40-49	6 (12.5%)	42 (87.5%)	
	50+	0 (0.0%)	14 (100%)	
Nationality	Bahraini	56 (17.8%)	259 (82.2%)	0.107
	Non - Bahraini	8 (10.3%)	70 (89.7%)	
Employment Status	Employed	58 (17.4%)	276 (82.6%)	0.168
	Unemployed	6 (10.2%)	53 (89.8%)	
Monthly income	<500	8 (16.7%)	40 (83.3%)	0.700
	500-999	16 (15.7%)	86 (84.3%)	
	1000-1999	11 (20%)	44 (80%)	
	2000+	2 (9.1%)	20 (90.9%)	
Marital Status	Single	34 (16.1%)	177 (83.9%)	0.504
	Married	28 (16.1%)	146 (83.9%)	
	Divorced	3 (30%)	7 (70%)	
	widower	0 (0.0%)	0 (0.0%)	
Education Level	Primary School	0 (0.0%)	2 (100%)	0.895
	Intermediate School	5 (22.7%)	17 (77.3%)	
	Secondary School	14 (17.1%)	68 (82.9%)	
	Institution/ Academy	5 (16.1%)	26 (83.9%)	
	University	41 (16%)	216 (84%)	
Smoking	Yes	41 (26.5%)	114 (73.5%)	**<0.001**
	No	21 (9.3%)	204 (90.7%)	
Consuming energy drinks	Yes	23 (22.8%)	78 (77.2%)	**0.050**
	No	32 (16.1%)	167 (83.9%)	
	Sometimes	7 (9.1%)	70 (90.9%)	

Attitudes towards AAS

Among AAS users, 28.6% reported that it was difficult to get AAS. Although 51.4% of AAS users recommended using AAS in a correct way, only 9.9% of AAS users mentioned that it should be avoided. On the subject of AAS effects; 24.1% of AAS users agreed that steroids can build up muscles fast and efficiently and 32.1% believed it was necessary for body builders to use AAS. Regarding the harmful effects of AAS use, only 18% of AAS users thought that AAS is bad for health while 44.8% thought the contrary (P< 0.001).

Practice of AAS users

When it comes to using AAS, a combination of oral and injectable routes was the most common practice (63.5%), followed by only injections (26.9%) and an oral route (9.6%). As for those who were using the injectable form, 55.3% were administering it by themselves. Most of AAS users took AAS once or twice in their lifetime (34.6%). The majority of AAS users reported that their workout depends on using AAS (58.8%) with 77.4% got the desired AAS effect.

The predominant reasons for using AAS was to build up muscles (80.8%) (Table 3). A specific seller was the most common source of obtaining AAS (44.2%), followed by friends in the gym (36.5%).

Table-3: Reasons for using AAS

	(n) (%)
To build up muscles	42 (80.8%)
To gain better strengths	17 (32.7%)
Because others are using it	2 (3.8%)
Was recommended by others	3 (5.8%)
I read about it and I liked it	5 (9.6%)
Others	4 (7.7%)

Recommendation to use AAS

The majority of the population reported that AAS use was not recommended for them (58.6%). However, the main sources of recommendation were by friends or gym members (27.7%), followed by coaches (14.4%).

DISCUSSION

The prevalence of AAS use in Bahrain was found to be lower than similar studies reported in the Arabian gulf region [1, 4, 7]. The prevalence might be underestimated; this could be attributed to the convenient selection of the study participants, self-administered questionnaire and fear of legal liability from reporting AAS use despite insuring anonymity and confidentiality [11]. The types of gyms selected randomly could be another contributing factor as certain gyms strictly prohibit AAS use.

This study showed the majority of AAS users were among 30 – 39 years old (17.9%). This is different from what is reported in other studies conducted in Kuwait, Riyadh city and Al Ain city as the majority of AAS users were between 19 – 29 years old[1,4,7]. This highlights an important factor regarding targeting the age group of potential users for the prevention programs [1, 7]. Younger adults are mostly concerned about their body image, which outweighs health risks associated with AAS use; this could be due to strong influence of media about the ideal body image for a young male adult [12-14].

The majority of the socio-demographical data showed no significant association with AAS use. A study conducted in Riyadh showed that there was an association between monthly income, marital and employment status with AAS use, which is against our finding in this study [7]. One of the reasons for such difference in results could be attributed to the low reporting of monthly income in this study. Another explanation could be that young adults' concerns to reach idealized body image minimized the effects of the socio-demographical factors.

Most AAS users thought it was difficult to get AAS, reasons for that could be explained by the need of a controlled prescription and the unavailability of high quality AAS in the black market[9,15]. AAS users believed that AAS is important for building muscles fast and efficiently especially for competitive body builders and it will be beneficial only if administered correctly; such similar findings were observed in other studies in the region [1, 4]. However, only few of the AAS users were concerned about the risk-related effect of AAS which is comparable to previous studies done in Kuwait and Riyadh city [1, 7].

The most common source of obtaining AAS was a specific seller followed by friends in the gym. This indicates that AAS is acquired from illegal sources which can raise suspicion of the quality and safety of these products [15]. This is an interesting finding as other studies showed that the most common source of AAS was the gym trainers which minimize the effect of trainers as a risk factor in our study [1, 4, 13].

The most common method of using AAS was the combination of the injectable and oral routes which is consistent with other studies done in Kuwait and Jazan city[1,16]. The injections were usually administered by AAS users themselves which exposes them to risks of improper injections' techniques, including: injection site pain, muscle fibrosis, neurovascular damage and infectious diseases like hepatitis and HIV [17].

In this study, it was found that there is a significant association between using AAS and other unhealthy life style habits (smoking and energy drinks consumption) and using other supplements which predispose AAS users to further health related complications; this result is supported by previous published studies[1, 6, 11, 17, 18]. The reason for the intake of multiple supplements could be explained by the desire to achieve faster synergistic effects [19, 20]. Furthermore, AAS users might be at risk for other substances abuse including illicit drugs and alcohol drinks [6, 18].

In assessing the knowledge of AAS harmful effects, there was no statistical significant difference of knowledge level between AAS users and non-users which was low for both, though more than half of the users believed that they had enough information about AAS. These results are similar to studies done in Kuwait and Sweden [1, 18]. The main source of information regarding AAS in our study was friends which correlate with other studies done in Al-Ain city (UAE) and KSA [4, 13]. This low knowledge level could be due to the lack of media awareness of AAS harmful effects and insufficient screening of AAS users by health care professionals as well as improper strong healthy body image perceived by young male adults [7].

LIMITATIONS AND STRENGTHS

The main strength of this study is being the first and leading AAS study in Bahrain, additionally the randomized selection of gyms limited selection bias. While conducting the study, there were some limitations; the selection of participants was through convenient sampling due to limited time frame for data collection. Due to the design of this study, some AAS users might be reluctant to disclose their AAS use in fear of embarrassment as well as legal ligation.

CONCLUSION AND RECOMMENDATIONS

This is a pioneer study conducted in Kingdom of Bahrain that will allow further studies to build up and expand on this topic. This study showed the prevalence of AAS use was 14.6% with the intention to use AAS in the future was 14.9% and the majority of users were below the age of 50 years old. Both AAS users and non-users lacked knowledge regarding the risk of AAS use. These results highlight the importance of tackling this problem among our young adults to minimize the usage, prevent the harmful effects of AAS and decrease the burden on individuals, community and ministry of health. Limiting AAS use can be achieved by spreading awareness of AAS use harmful effects in the society.

Although there are clear rules and regulations regarding AAS use from NHRA, we recommend law enforcement, strict control of black market and imposing sanctions.

Author Contribution

All authors share equal effort contribution towards (1) substantial contributions to conception and design, acquisition, analysis and interpretation of data; (2) drafting the article and revising it critically for important intellectual content; and (3) final approval of the manuscript version to be published. Yes

REFERENCES

1. Alsaeed, I., & Alabkal, J. R. (2015). Usage and perceptions of anabolic-androgenic steroids among male fitness centre attendees in Kuwait-a cross-sectional study. *Substance abuse treatment, prevention, and policy*, *10*(1), 33.
2. Fahey, T. D. (1998). Anabolic-androgenic steroids: mechanism of action and effects on performance. *Encyclopedia of sports medicine and science. Internet Society for Sport Science*.
3. Ager, H. (2015). *Application of the theory of planned behaviour to explain adult male anabolic androgenic steroid use among gym users* (Doctoral dissertation, University of Lincoln).
4. Al-Falasi, O., Al-Dahmani, K., Al-Eisaei, K., Al-Ameri, S., Al-Maskari, F., Nagelkerke, N., & Schneider, J. (2008). Knowledge, attitude and practice of anabolic steroids use among gym users in Al-Ain District, United Arab Emirates. *Open Sports Med J*, *2*, 75-81.
5. Striegel, H., Simon, P., Frisch, S., Roecker, K., Dietz, K., Dickhuth, H. H., & Ulrich, R. (2006). Anabolic ergogenic substance users in fitness-sports: a distinct group supported by the health care system. *Drug and alcohol dependence*, *81*(1), 11-19.
6. De Siqueira Nogueira, F. R., de Freitas Brito, A., de Oliveira, C. V. C., Vieira, T. I., & Beniz Gouveia, R. L. (2014). Anabolic–androgenic steroid use among Brazilian bodybuilders. *Substance use & misuse*, *49*(9), 1138-1145.
7. Jabari, M., Al-shehri, H., Al-faris, A., Al-sayed, M., Algaeed, F., Al-sobaie, N., & Al-saleh, F. (2016). The prevalence of anabolic androgenic steroid use amongst athletes in Riyadh (Saudi Arabia). *Electronic physician*, *8*(12), 3343.
8. Kious, B. M. (2008). Philosophy on steroids: why the anti-doping position could use a little enhancement. *Theoretical Medicine and Bioethics*, *29*(4), 213.
9. Circular published by NHRA regarding antibiotics, antivirals and corticosteroids drugs use regulations. (2014). Available from: http://www.nhra.bh/files/files/PPR/NHRA-PPR%20CEO%20Circular%201-2014%20on%20Antibiotics%20and%20Cortisons%20Dispensing_20140220.pdf
10. Arya, R., Antonisamy, B., & Kumar, S. (2012). Sample size estimation in prevalence studies. *The Indian Journal of Pediatrics*, *79*(11), 1482-1488.
11. Khullar, N., Scull, N. C., Deeny, M. C., & Hamdan, E. (2016). Prevalence and Predictors of Anabolic-Androgenic Steroid Use among Gym Users in Kuwait: A Preliminary Study. *International Journal of Men's Health*, *15*(2).
12. Tahtamouni, L. H., Mustafa, N. H., Alfaouri, A. A., Hassan, I. M., Abdalla, M. Y., & Yasin, S. R. (2008). Prevalence and risk factors for anabolic-androgenic steroid abuse among Jordanian collegiate students and athletes. *The European Journal of Public Health*, *18*(6), 661-665.
13. Althobiti, S. D., Alqurashi, N. M., Alotaibi, A. S., Alharthi, T. F., & Alswat, K. A. (2018). Prevalence, attitude, knowledge, and practice of anabolic androgenic steroid (AAS) use among gym participants. *Materia socio-medica*, *30*(1), 49.
14. Kanayama, G., Barry, S., Hudson, J. I., & Pope Jr, MD, MPH, H. G. (2006). Body image and attitudes toward male roles in anabolic-androgenic steroid users. *American Journal of Psychiatry*, *163*(4), 697-703.
15. Fink, J., Schoenfeld, B. J., Hackney, A. C., Matsumoto, M., Maekawa, T., Nakazato, K., & Horie, S. (2019). Anabolic-androgenic steroids: procurement and administration practices of doping athletes. *The Physician and sportsmedicine*, *47*(1), 10-14.
16. Bahri, A., Mahfouz, M. S., Marran, N. M., Dighriri, Y. H., Alessa, H. S., Khwaji, M. O., & Zafar, S. M. (2017). Prevalence and awareness of anabolic androgenic steroid use among male body builders in Jazan, Saudi Arabia. *Tropical Journal of Pharmaceutical Research*, *16*(6), 1425-1430.
17. World Anti-Doping Agency. (2009). Dangers of Doping: Get the Facts. [online] Available at: https://www.wada-ama.org/en/resources/education-and-prevention/dangers-of-doping-get-the-facts.
18. Molero, Y., Bakshi, A. S., & Gripenberg, J. (2017). Illicit drug use among Gym-Goers: a cross-sectional study of Gym-Goers in Sweden. *Sports medicine-open*, *3*(1), 31.
19. Baker, J. S., Graham, M., & Davies, B. (2006). Gym users and abuse of prescription drugs.
20. Melia, P., Pipe, A., & Greenberg, L. (1996). The use of anabolic-androgenic steroids by Canadian students. *Clinical journal of sport medicine: official journal of the Canadian Academy of Sport Medicine*, *6*(1), 9-14.