

Sexual Quality Of Life Among Users Of Anabolic Androgenic Steroid Supplements: Prevalence Study In Baghdad Fitness Centers

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Abstract

Background: Sexuality is a fundamental human activity. It relates to how individuals perceive or express their sexuality. sexual health is considered an important contributor to overall quality of life among adults across different age groups. **Objective:** To assess the sexual quality of life, among users of Anabolic Androgenic Steroid supplements among gym-attendants in Baghdad, and its associated factors. **Method:** A cross-sectional study carried out in Baghdad city in the period from 1st of Jan through Mar 2026. Data were collected from 20 gym centers in Baghdad city (10th from Al-Kharkh and 10 from Al-Resafa), 157 Married males, who regularly attend the gyms and currently use dietary or fitness supplements, were collected using standardized questionnaire. **Results:** Poor sexual wellbeing, poor sexual experiences related distress and poor sexual experiences regarding certain mental health aspects during the last 4 weeks were observed among AAS users compared to those using other supplements (P. value =0.003,0.001,0.001) respectively. Significant differences were found in the mean values of all hormones, with higher levels of total testosterone, LH and FSH, among participants who get their AAS from their friends, with lower prolactin levels (P-value = 0.038, 0.022, 0.016,0.022, respectively). Participants who experienced erectile dysfunction had significantly lower prolactin level of 6.7 ± 2.5 ng/ml, compared to 11 ± 3.3 ng/ml in those who did not have this side effect of AAS (P-value=0.001). **Conclusions:** Androgenic anabolic steroids were the third most common supplement used by gym attendees, especially among older age, married, and those with longer duration of gym membership and more frequent days of attendance gym-goers. A negative association was found between using Androgenic anabolic steroids and levels of Sexual Wellbeing and Sexual experiences. lower testosterone levels were detected among users of Androgenic anabolic steroids. Also the current study found that using AAS was associated with high rates of side effects where they reported by (64.3%) of the study participants, the main reported side effects were decreased libido, erectile dysfunction, mood changes, acne/hair loss, gynecomastia and infertility, all these side effect can contribute to poor QoL about both physical and sexual aspects. On the other hand, we found that the use of AAS was significantly associated with poor sexual wellbeing and poor sexual experiences.

Keywords: Sexual Quality of life, Anabolic Androgenic steroid supplements, Regular gym-attendants, Baghdad fitness centers.

1. Introduction

Quality of life (QoL) refers to the overall safety and health of a population or a person, encompassing both favorable and unfavorable elements of their circumstances at a specific point in time. Fundamental elements related to Quality of Life include one's own wellness (physical, psychological, mental, and emotional), interpersonal relationships, academic achievement, occupational conditions, social status, disposable income, a sense of assurance and security, independence, freedom in making choices, sense of identity, and the outside world. (1-3) Sexuality is a fundamental human activity. It relates to how individuals perceive or express their sexuality. It encompasses behaviors conducted solo (e.g., masturbation), with one partner (sexual relations, sexual activity via oral contact, etc.), or with numerous partners (collective sex). Sexual engagement is a significant aspect of social behavior, distinct from mental and physical health, and influences quality of life. The WHO characterizes sexual health as a "state of well-being in all aspects of one's life concerning sexuality; it is not solely the absence of disease, dysfunction, or infirmity".(5-7) Recently, the use of androgenic-anabolic steroids (AAS) among gym attendees has become increasingly common, despite their potential adverse effects on sexual

function, hormonal balance, and overall wellbeing.(8,9)

The WHO has acknowledged its importance by including an item on sexual activity in its assessment of QoL. This concept highlights that sexuality is a natural and integral part of human life and plays a significant role in an individual's quality of life. (10) Sexual satisfaction is strongly associated with general health and well-being. Individuals who report higher sexual satisfaction often experience better psychological stability, improved interpersonal relationships, and greater life satisfaction. (13) Sexual quality of life is influenced by multiple biological, psychological, and social factors. (14) Iraqi studies that investigate the healthy gym attenders are scarce or not performed yet, Therefore, the present study undertaken to help address the present knowledge gap on this topic. Hence, the present study aimed to evaluate the sexual QoL of Iraqi gym attenders and to estimate how frequently the AAS-containing supplements are used and their effects on the sexual QoL of this population.

Method:

A cross-sectional study, carried in Baghdad city in the period from 1st of Jan to the end of march 2026. Data were collected from 20 gym centers in Baghdad city (10th from Al-Kharkh and other 10 from Al-Resafa), 157 Married apparently healthy males, aged of 18 to 35 years, who attend gyms regularly (training ≥ 4 times/week, for ≥ 60 minutes/session, for ≥ 6 months), and currently use dietary or fitness supplements, were included in this study. Multistage sampling technique was applied, to select the study participants, through using a random sampling technique. The Exclusion criteria were; Participants with chronic illness (e.g., diabetes, cancer), History of orchidectomy, testicular cancer, or radical prostatectomy, Current use of medications known to severely impact sexual function (e.g., SSRIs, 5-alpha-reductase inhibitors) or hormones other than (AAS/TRT) Excessive alcohol consumption or illicit drug use. Severe liver or kidney disease. Additionally, participants who used herbal supplements, antioxidants, multivitamins or drugs that may affect erectile function and sex hormones all were excluded.

Data were collected from the participants inside the selected gym centers using a questionnaire that included socio-demographic characteristics, gym-related practices, use of androgenic-anabolic steroids and dietary supplements, physical quality of life assessment, sexual wellbeing, and sexual function-related domains. Anthropometric and laboratory data were also obtained from the participants.

For data analysis, SPSS version 26 (SPSS Inc., Chicago, IL, USA) statistical software, was used. Pearson Chi-square test was used for the test association. Kruskal-Wallis one-way analysis of variance ANOVA, followed by post hoc analyses, were used for mean differences. To pinpoint significant differences between specific groups, post hoc pairwise multiple comparisons were carried out, incorporating Bonferroni correction. A p value less than 0.05 indicated statistical significance.

Results

Distribution of the types of dietary or fitness supplements

Among 157 participants who used dietary or fitness supplements, 64 (40.76) were using Androgenic Anabolic Steroids (AAS) and 93 (59.24%) used other supplements (like Protein powders and creatine. Pre-workout supplements and other supplements were less commonly reported) (Figure 1).

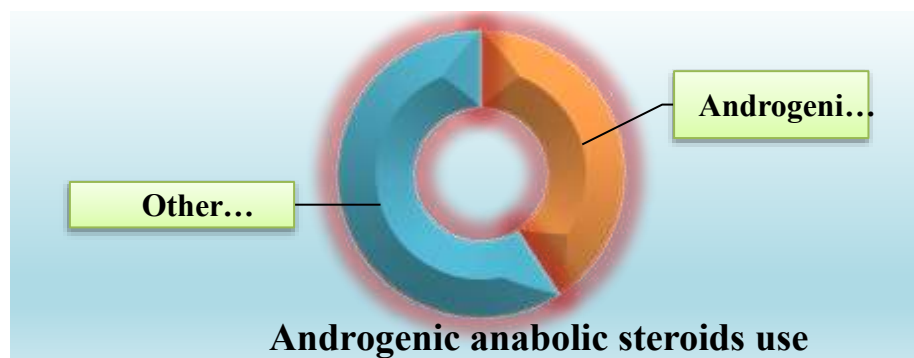


Figure 3. The prevalence of AAS supplement use, among all dietary or fitness supplement users (T=157)

Younger age participants (≤ 20 years), tend to use other supplements, rather than AAS, compared to older participants (20-29 years). The proportion of participants aged (≤ 20 years) who used AAS was 1.6%, compared to 8.6% among those using other supplements, in those aged 20-29 years the proportion was 31.3% used AAS, and 55.9% used other supplements. Conversely, the proportions of participants who used AAS were higher in those aged 30 years and older (P-value =0.001). Higher proportion of participants who used AAS were married compared to those who used other supplements, 79.7% vs. 60.2%, respectively, (P. value = 0.007), (table 1)

Table 1 also depicts a significant association between AAS use and longer duration of gym membership; participants with a duration of >12 months contributed 62.5% of AAS users compared to 38.7% among those using other types of supplements, (P. value <0.009). Participants attending the gym for 3 days contributed 25% of AAS users compared to 45.2% among those using other supplements. Participants attending the gym for 4-5 days contributed 75% among AAS users compared to 54.9% of those using other supplements, (P. value <0.010), (Table 1)

Table 1. The AAS users versus demographic characteristics of all dietary or fitness supplements users (n=157)

Variables		Androgenic anabolic steroids use (n=64)		Other supplements use (n=93)		P value
		No.	%	No.	%	
Age (years)	<20years	1	1.6	8	8.6	0.001*
	20 - 29	20	31.3	52	55.9	
	30 - 39	34	53.1	28	30.1	
	40 - 49years	9	14.1	5	5.4	
Marital status	Married	51	79.7	56	60.2	0.007*
	Divorced/ Widowed	8	12.5	11	11.8	
	Separated	5	7.8	26	28.0	
Educational level	Intermediate school	-	-	2	2.2	0.302
	Secondary school	2	3.1	10	10.8	
	Bachelor's degree	59	92.2	77	82.8	
	Diploma	2	3.1	2	2.2	
	Master's degree	1	1.6	2	2.2	
Employment status	Student	7	10.9	13	14.0	0.742
	Employed	36	56.3	54	58.1	
	Unemployed	21	32.8	26	28.0	
BMI (Kg/m²)	Normal (18.5-24.9)	14	21.9	37	39.8	0.054
	Overweight (25-29.9)	44	68.8	51	54.8	
	Obese (30-34.9)	6	9.4	5	5.4	
Duration of gym membership	6months	-	-	2	2.2	0.009*
	>6 - 12	24	37.5	55	59.1	
	>12months	40	62.5	36	38.7	
Weekly gym attendance (days)	3	16	25.0	42	45.2	0.010*
	4	38	59.4	33	35.5	
	5	10	15.6	18	19.4	
*Significant, Pearson Chi-square test (χ^2 -test) at P≤ 0.05 level.						

A poor sexual wellbeing, poor sexual experiences/ distress and poor sexual experiences regarding certain mental health aspects in the last 4 weeks, all were among AAS users compared to those using other supplements. (P. value =0.003,0.001,0.001, respectively) (Table 2).

Table 2. The AAS users versus levels of Physical Quality of life and Sexual QoL of all dietary or fitness supplements users

		Androgenic anabolic steroids use (n=64)		Other supplements use (n=93)		P value*
		No.	%	No.	%	
Physical Quality of life in the last 4 weeks	Poor	22	34.4	19	20.4	0.051
	Good	42	65.6	74	79.6	
Sexual Wellbeing In the last 4 weeks	Poor	18	28.1	9	9.7	0.003
	Good	46	71.9	84	90.3	
Sexual experiences related distress during the last 4 weeks	Poor	12	18.8	3	3.2	0.001
	Good	52	81.3	90	96.8	
Sexual Experiences regarding certain mental health aspects during the last 4 weeks	Poor	21	32.8	11	11.8	0.001
	Good	43	67.2	82	88.2	
Pearson Chi-square test (χ^2 -test) was used in comparison at P≤ 0.05 level.						

None of biochemical and hormonal parameters showed significant association with the type of used supplements except total testosterone which was lower among those used AAS compared to participants using other supplements, the proportion of participants with low total testosterone was 29.7% among AAS users compared to 14% among users of other supplements, (P. value <0.016). , (Table 3).

Table 3. Other supplements users versus levels of biochemical and hormonal levels of all dietary or fitness supplements users (N=157).

		Androgenic anabolic steroids use (n=64)		Other supplements use (n=93)		P value
		No.	%	No.	%	
ALT (SGPT) (IU/L)	High (>45)	18	28.1	23	24.7	0.634
	Normal	46	71.9	70	75.3	
	Mean (SD)	35.86 (17.62)		33.59 (17.83)		0.432
AST (SGOT) (IU/L)	High	13	20.3	18	19.4	0.882
	Normal	51	79.7	75	80.6	
	Mean (SD)	31.06 (12.20)		30.19 (14.08)		0.690
Total Testosterone (ng/ml)	Normal	45	70.3	80	86.0	0.016
	Low	19	29.7	13	14.0	
	Mean (SD)	3.85 (1.67)		4.20 (1.46)		0.159
LH (mIU/ml)	Normal	48	75.0	73	78.5	0.609
	Low	16	25.0	20	21.5	
	Mean (SD)	2.39 (1.88)		2.77 (2.0)		0.235
FSH (mIU/ml)	Normal	48	75.0	76	81.7	0.310

	Low	16	25.0	17	18.3	
	Mean (SD)	2.52 (1.95)		2.82 (1.93)		0.336
Prolactin (PRL) (ng/ml)	High (>17)	2	3.1	9	9.7	0.114
	Normal	62	96.9	84	90.3	
		Mean (SD)	10.53 (3.57)		11.29 (4.2)	
*Pearson Chi-square test (χ^2 -test) used to compare frequencies; Students-t-test used to compare mean values at P≤0.05 level. SD: standard deviation, FSH: Follicle-Stimulating Hormone, LH: Luteinizing Hormone						

SD: standard deviation, FSH: Follicle-Stimulating Hormone, LH: Luteinizing Hormone

Further analysis was performed to assess the association between ALT and AST levels from one side against duration of AAS use, source of AAS and experienced side effect among AAS users, this analysis revealed no significant association with any of these variables, (Table 4).

Table 4. Associations of ALT and AST levels against duration of AAS use, source of AAS and experienced side effect among AAS users

Variable		ALT (SGPT) (IU/L)			AST (SGOT) (IU/L)		
		Mean	SD	P value	Mean	SD	P value
The duration of AAS use							
6 months	35.9	18.0	0.977	31.1	11.3	0.866	
> 6- 12 months	35.0	17.8		30.2	13.0		
>12 months	35.0	15.9		32.3	11.9		
The source of AAS used							
Coach/trainer	Yes	32.9	17.2	0.158	29.8	12.0	0.248
	No	38.8	16.7		33.1	11.2	
Friends	Yes	35.1	15.8	0.913	29.9	11.7	0.504
	No	35.6	17.8		31.9	11.8	
Pharmacy	Yes	35.3	21.0	0.989	34	15.1	0.590
	No	35.4	17.0		31	11.5	
Online market	Yes	40.1	19.3	0.486	36.7	11.3	0.233
	No	35	17.0		30.7	11.7	
Other sources	Yes	42.1	17.8	0.322	33.6	8.3	0.612
	No	34.8	17.1		31	12.0	
Have experienced							
Side-effects	Yes	35.8	16.2	0.801	32.4	11.4	0.262
	No	34.7	18.9		29.1	12.1	
1.Decreased libido	Yes	34.8	15.3	0.86	31.8	10.1	0.835
	No	35.6	17.8		31.1	12.3	
2.Erectile dysfunction	Yes	31.8	18.3	0.563	30.4	14.0	0.834
	No	35.8	17.1		31.4	11.6	
3.Mood changes	Yes	35.5	18.4	0.984	34.4	11.3	0.365
	No	35.4	17.1		30.7	11.8	

4.Acne/hair loss	Yes	37.1	16.9	0.533	32.4	11.4	0.538
	No	34.5	17.4		30.6	12.0	
5.Gynecomastia	Yes	31.8	12.8	0.346	28.7	11.2	0.323
	No	36.5	18.2		32	11.9	
6.Infertility	Yes	29.5	13.5	0.542	24.5	13.1	0.310
	No	35.7	17.3		31.6	11.7	

Table 5, illustrates that, none of the hormonal levels showed significant association with the duration of AAS use, no significant differences in mean values of total testosterone, LH, FSH and prolactin. Regarding the source of AAS, Significant differences were found in the mean values of all hormones, with higher levels of total testosterone, LH and FSH, among participants who get their AAS from their friends, with lower prolactin levels, (P. value=0.038, 0.022, 0.016, 0.022, respectively). No significant differences in mean hormonal levels were found among those who get AAS from the coach/trainer, (Table 5).

As well as there were significantly higher testosterone levels, in participants who get the AAS using online marketing, (P-value=0.033). A significant lower mean LH was reported among participants who get AAS from other sources (P. value 0.009), (Table 5). Regarding the side effects and other issues experienced by AAS user participants, there are no significant differences in mean values of almost all hormones across all these issues. Except erectile dysfunction, where participants who experienced erectile dysfunction had significantly lower prolactin level of 6.7 ± 2.5 ng/ml compared to 11 ± 3.3 ng/ml in those who did not have erectile dysfunction, (P. value = 0.001), (Table 5).

Table 5. Hormonal levels against duration of AAS use, source of AAS and experienced side effect among AAS users

Variable		TT (ng/ml)	LH (mIU/ml)	FSH (mIU/ml)	PRL (ng/ml)
The duration of AAS use					
<6 months		3.7 (1.8)	2.6 (1.8)	2.6 (2.0)	10.6 (3.4)
6- 12 months		3.6 (1.6)	2.2 (1.9)	2.4 (2.1)	10.5 (2.7)
>12 months		4.4 (1.6)	2.5 (2)	2.6 (1.9)	10.4 (4.2)
P. value		0.247	0.81	0.952	0.976
The source of AAS used					
Coach/trainer	Yes	3.7 (1.7)	2.2 (1.8)	2.3 (1.8)	10.4 (3.3)
	No	4.2 (1.7)	2.8 (2)	2.9 (2.1)	10.7 (3.7)
	P. value	0.172	0.174	0.154	0.766
Friends	Yes	4.5 (1.5)	3.2 (1.8)	3.4 (2.1)	9.1 (3.6)
	No	3.6 (1.7)	2.1 (1.8)	2.2 (1.8)	11.2 (3.3)
	P. value	0.038#	0.022#	0.016#	0.022#
Pharmacy	Yes	3.8 (2.0)	3.4 (1.8)	2.6 (1.4)	11.5 (3.5)
	No	3.9 (1.7)	2.4 (1.9)	2.6 (2)	10.5 (3.5)
	P. value	0.883	0.261	0.948	0.525
Online market	Yes	5.3 (1.7)	3.2 (2.2)	2.9 (1.8)	11.2 (3.5)
	No	3.8 (1.6)	2.4 (1.9)	2.5 (2)	10.5 (3.5)
	P. value	0.033#	0.356	0.626	0.631
Other sources	Yes	3.9 (1.5)	0.6 (1.0)	1.2 (1.8)	12.3 (3.7)
	No	3.9 (1.7)	2.7 (1.9)	2.7 (1.9)	10.4 (3.5)
	P. value	0.943	0.009#	0.081	0.189
Have experienced					
Side-effects	Yes	3.9 (1.6)	2.4 (2)	2.5 (2.1)	10.8 (3.7)
	No	3.8 (1.9)	2.7 (1.7)	2.7 (1.7)	10.1 (3.1)
	P. value	0.740	0.542	0.746	0.468
Decreased libido	Yes	4.3 (1.5)	2.8 (2)	3.1 (2.2)	9.9 (3.9)

	No	3.8 (1.7)	2.4 (1.8)	2.4 (1.9)	10.8 (3.4)
	P. value	0.271	0.418	0.197	0.382
Erectile dysfunction	Yes	3.7 (1.5)	2.3 (2.1)	2.1 (1.9)	6.7 (2.5)
	No	3.9 (1.7)	2.5 (1.9)	2.6 (2)	11.0 (3.3)
	P. value	0.773	0.767	0.515	0.001#
Mood changes	Yes	4.5 (2.4)	2.8 (2.1)	2.9 (2.1)	12 (2.7)
	No	3.8 (1.6)	2.4 (1.9)	2.5 (1.9)	10.3 (3.6)
	P. value	0.240	0.556	0.519	0.166
Acne/hair loss	Yes	3.8 (1.4)	2.1 (1.8)	2.2 (1.7)	11.5 (3.9)
	No	3.9 (1.9)	2.7 (1.9)	2.8 (2.1)	10 (3.2)
	P. value	0.838	0.220	0.211	0.089
Gynecomastia	Yes	3.7 (1.3)	2.5 (2)	2.6 (2.1)	10.9 (2.9)
	No	4 (1.8)	2.5 (1.9)	2.6 (1.9)	10.4 (3.6)
	P. value	0.525	0.997	0.94	0.603
Infertility	Yes	3.7 (1.5)	2.8 (3.3)	4.1 (3.3)	6.9 (1.4)
	No	3.9 (1.7)	2.5 (1.8)	2.5 (1.9)	10.7 (3.5)
	P. value	0.835	0.734	0.165	0.063
Significant difference between two independent means using Students t-test at 0.05 level					

Discussion

The demographic characteristics of the study participants consistent with the demographic properties that reported in previous Iraqi studies that include gyms members; in the present study, majority of participants aged between 20-39 years, with Bachelor's degree, employed with a mean BMI of 25.7 ± 2.3 kg/m² with only 7.5% obese participants, 81% attended the gym for 3-4 times per week, these findings agreed with that documented by previous Iraqi studies conducted by Mahmood et al. (15), Mekkey & Tizkam (16) and Sakr et al. (17) so as an Iranian study reported almost similar demographic characteristics among gym-attenders (18)

According to these findings and in line with the study objectives, the prevalence of AAS was 40.8%, which can be considered high, however, Mahmood et al. (15) documented that more than 30% of participants used protein supplements. In Thi-Qar, Sakr et al. (17) stated that 15% of participants used AAS which is lower than the rate reported in our study. An earlier Iraqi study conducted in 2017 by Al-Hemiery et al. (19) showed that among 3200 people represented a nationally representative sample, the lifetime prevalence of AAS use was 1.3%. In Kuwait, a prevalence of AAS use of 35% was documented by Khullar et al., (20) in 2016. In a Saudi study conducted by Al Nozha and ElShatarat (21) included 319 male gym attenders and found that 11.4% of them were AAS abusers. In another Saudi study in Jazan, Bahri et al. (22) found a lifetime prevalence of AAS use of 31%. However, in 2018, Sagoe and Pallesen (23) documented higher prevalence of AAS use in Western countries and the Middle East but lower rates in Africa and Asia. In Jordanian study conducted by AlKasasbeh et al. (24), the proportion of male gym-goers who used AAS was 32.9% which is close to the rate reported in the present study. However, our reported and the Jordanian rates are high compared to that reported in a meta-analysis for the global epidemiology of AAS which indicated an overall prevalence of AAS use of 6.4% among males (25). In Saudi Arabia, the rate of using AAS was 29.3% was reported by Alharbi et al. among 482 participants (26) The wide variation in the prevalence of using AAS could be attributed to the cultural variation across the countries, attitude toward body building, regulatory laws, availability of and accessibility of AAS, socio-economic factors, and effectiveness of health education, believes of peoples, awareness of gym owners and knowledge of gym-goers about these supplements.

Regarding the sources of AAS where the AAS users obtained these supplements, unfortunately, the coach/trainer was the main responsible source; more than half (57.1%) of the study participants got AAS from their coach/trainer, this clearly reflect the effect of coach/trainer to increase the use of these substances by encouraging the gym-goers to consume AAS unaware of their side effects. Friends contributed 31.4% of sources, that may indicate the peer pressure on gym-goers. It is well-known that there are several sources of AAS and they are varied across different countries and even on the national levels, based on the country's laws, enforcement and gym culture. As well as, in the recent time, online markets have become widespread and easily accessible without real legitimate regulations particularly in Iraq where the legality of AAS is poorly defined, additionally, steroids are available in the pharmacies without strict prescription monitoring. (27)

The current study found that using AAS was associated with high rates of side effects where they reported by (64.3%) of the study participants, the main reported side effects were decreased libido, erectile dysfunction, mood changes, acne/hair loss, gynecomastia and infertility, all these side effect can contribute to poor QoL about both physical and sexual aspects. The side effects of AAS have been widely investigated and documented in many studies and litterateurs; The sexual and reproductive effect of AAS have been extensively recognized and documented by many authors. (28)

In the present study according to the scoring of the responses of the study participants toward the QoL questionnaire, with regards to sexual wellbeing in the last 4 weeks, most participants, 85%, showed good sexual wellbeing. We found that the use of AAS was significantly associated with poor sexual wellbeing and poor sexual experiences. In a study conducted in Abu Dhabi, UAE, Manaf Al Hashimi (29) concluded a significant negative impact of AAS abuse on sexual health, libido, sexual function, erectile functionality and fertility. Another study conducted by Freire et al. (30) indicated that AAS misuse was associated with male sexual dysfunction, with symptoms like erectile dysfunction, lower libido as well as depressive symptoms even after long-term cessation of AAS use

The present study found significant lower testosterone levels among those used AAS. In the same context, Rasmussen et al. (41) concluded that former AAS user had lower levels of plasma testosterone and higher rates of hypogonadism. On the other hand, current users of AAS had significantly lower levels of AMH and inhibin B which reflected the impairment in spermatogenesis.

Conclusions:

Androgenic anabolic steroids were the third most common supplement used by gym attendees, especially among older age, married, and those with longer duration of gym membership and more frequent days of attendance gym-goers. A negative association was found between using Androgenic anabolic steroids and levels of Sexual Wellbeing and Sexual experiences. lower testosterone levels were detected among users of Androgenic anabolic steroids. Also the current study found that using AAS was associated with high rates of side effects where they reported by (64.3%) of the study participants, the main reported side effects were decreased libido, erectile dysfunction, mood changes, acne/hair loss, gynecomastia and infertility, all these side effect can contribute to poor QoL about both physical and sexual aspects. On the other hand we found that the use of AAS was significantly associated with poor sexual wellbeing and poor sexual experiences.

Conflict of interest:

The authors declare no conflicts of interest.

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