Knowledge and Awareness Associated with Illicit Anabolic-Androgenic Steroid Abuse among Recreational Bodybuilders in the State of Kuwait

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The knowledge, attitudes, and awareness of bodybuilders illicit Androgenic-Anabolic Steroids (AAS) and other presumed performance enhancing drugs users in the State of Kuwait were investigated. Anabolic ergogenic substance use, in particular the use of anabolic androgenic steroids, is a serious problem among athletes and none athletes. Fifty Kuwaiti male recreational bodybuilders (15 students and 35 health club members) were recruited from physical education departments and various health clubs in the State of Kuwait. Confidential questionnaires were administered to determine their knowledge and awareness toward the usage and the adverse effects of AAS. They demonstrated a very low physical, moderate sexual and high psychological level of knowledge and awareness. The most common types of AAS used by bodybuilders was Deca-durabolin 50 (100%). Human growth hormone (HGH) was used by 47 (94%). The mean AAS cycle was (4-6 weeks) and 48 (96%) used stacking method. Users received 94% of the information about steroids from coaches and 92% from the internet. The AAS users obtained 96% of their drugs from coaches and friends..

***Key words**: Deca -durabolin, anabolic-androgenic steroid (AAS)*

Introduction

Anabolic-androgenic steroids are usually called "anabolic steroids." Anabolic - Androgenic Steroids (abbreviated AAS) are synthetic forms of the male sex hormone testosterone and its derivatives. The anabolic effects of the drugs promote the growth of skeletal muscle and protein synthesis, and the androgenic effects promote the development of male sexual characteristics (Kanayama et al., 2010).

The use of illicit anabolic androgenic steroids (AAS) for gains in strength and muscle mass is relatively common among certain subpopulations including athletes, bodybuilders, adolescents and young adults. However, these drugs are used legally in the medical field by doctors primarily to treat males who experience delayed puberty and impotence (Sjoqvist et al., 2008).

In the recent decades, a shift from being a problem for athletes only, to be a very serious problem among adolescent and nonathletic (Bahrke et al., 2000, Kanayama et al., 2008,

Kinderman 2006, Potteiger and Stilger, 1994, Sjoqvist et al., 2008) particularly college students (Berning et al. 2008, Kersey 1996, Santos et al., 2011, Tahtamouni et al., 2008) and health club members (Al-Falasi et al., 2008, Baker et al., 2006).

In the past two decades, AAS have been used and abused by a wide variety of athletes in attempt to improve training, endurance, physical performance and body images (Eriksson et al., 2005, Goldfield and Woodside 2009, Hartgens and Kuipers, 2004). The number of elite and recreational athletes of different age groups using illicit AAS is raising in different countries (Al-Falasi et al., 2008, Kersey, 1996, Habeeb et al., 2012, Nicos et al., 2008,Rachon et al., 2006, Tahtamouni et al., 2008, Wanjek et al., 2007, Woerdeman et al., 2004) including Arabic countries such as United Arabic Emirates (Al-Falasi et al., 2008) Jordan (Tahtamouni et al., 2008, WHO 2004), Iraq (Habeeb et al., 2012) and few studies in Kuwait (Al-Shammari et al., 2009, Ghloum 1998, Thiblin and Petersson, 2005). Many studies have shown that the main reason of usage by recreational bodybuilders is to improve muscle size and cosmetic appearance. On the other hand, athletes such as bodybuilders and weight lifters use AAS to enhance the physical performance (Fitch, 2008, Hartgens and Kuipers, 2004, Kanayama et al., 2010, Kanayama et al., 2006, Kanayama et al., 2011, Kanayama et al., 2001, Parkenson and Evans, 2006).

Unfortunately, there are few available data or statistics to reveal the number and the pattern of illicit AAS usage among Kuwaiti male population (Al-Shammari et al., 2009, Kolarov, 2009, Kuwait time newspaper 2012). However, one can observe in many public places and campuses the high number of adolescents especially college students with muscular body build which may indicate the use of illicit AAS.

In order to provide educational information and statistical data to reduce reasons that encourage the illicit AAS use in Kuwait, the researchers decided to conduct the present study to investigate the knowledge, to identify risk factors and raise awareness of the adverse effects associated with illicit AAS use among Kuwaiti college students and health clubs members especially bodybuilders. Therefore, the purpose of the present study was to survey the number of college students, health club members and athletes especially bodybuilders and to test AAS user's knowledge and level of awareness regarding the use of anabolic steroids. In addition, the physiological and pharmacological effects and risk factors of the anabolic steroids used to enhance performance in sports and body image were surveyed. As a result, strategies were suggested to prevent further AAS use by college students, health club members and especially bodybuilders, while also alarming the government and health agencies of the severity of the problem.

Method

A self-administered confidential questionnaire (in Arabic language - (AppendixI) was conducted starting the first semester September 2013. The participating bodybuilders were selected (those choose to be included in the study thus not randomly chosen) from physical education department at College of Basic Education in the State

of Kuwait. Also, bodybuilders were selected from most gym users attending different types of gyms (hotels, social clubs, and commercial health clubs).

To improve the reliability and validity of the questionnaire, a pilot test were conducted at physical education class at the physical education department, in addition, students who selected as assistance were carefully instructed to distribute and learn how to present and collect the survey from the subjects in various designated health clubs. Four students were selected to 4 different provinces in Kuwait based on their house location. The completion of the questionnaire was approved and supervised by several department faculties and all subjects were assured anonymity.

The internal consistency for reliability was rather high (Cronbach alpha = 0.89). In order to improve the consistency even further, the results, were discussed among the researchers and department faculties. The first page (cover page) on the questionnaire provided general information about the study and a list of definitions.

Participants

The researchers selected two groups of Kuwaiti male recreational bodybuilders:

Collegiate students:

Initially, twenty five bodybuilder's recruited, 10 students were asked to answer the questionnaire so the authors can measure the validity and the reliability as well as clarity, length comprehensiveness, time of completion. These student then secluded form the current study. All students were part of the Physical Education Department in the College of Basic Education, Public Authority of Applied Education and Training in the State of Kuwait. All 15 students selected by intentional method and were AAS users

Health clubs members:

All of the bodybuilders were selected randomly from several health clubs (hotels, social clubs, gyms and commercial health clubs) in the State of Kuwait. Those gyms were located in 5 different Kuwaiti provinces (Capital, Hawally, Al-Ferwania, Mubark Alkabeer and Al-Ahmadi). Researchers ensured the equal selection of the subjects from all the provinces and health clubs.

Seventy bodybuilders both AAS users and members of health clubs were randomly selected out of 5 different Kuwaiti provinces. After explaining the purpose of the present study, only thirty five agreed to fully participate in the study, while the rest of the subjects declined the participation for various reasons.

Body composition:

The Body Mass Index (BMI) is a measurement tool that compares a subject height to his weight and the result would show an indication of whether the subject is overweight, underweight or at a healthy weight for his height. According the following BMI Categories: Underweight = <18.5, Normal Weight = 18.5 – 24.9, Overweight = 25 – 29.9, Obese = > 29.9. Weight and height were measured to the nearest 0.1 kg and 0.1 cm, with a Seca portable height stadiometer (Leicester, England). BMI was calculated using the following formula: weight (kg) / [height (m)]^2 (WHO, 2004).

Questionnaire

The confidential questionnaire consisted of several questions

specifically designed to reveal the usage of anabolic steroids and to test the knowledge and level of awareness of recreational male Kuwaiti collegiate students bodybuilders. The questionnaire was distributed by bodybuilders who are students and member in health clubs. The response rate was 82%. A list of coded numbers was used in the questionnaire to ensure the confidentiality of all subjects. A sealed envelope was used after the compilation of the questionnaire and handed in to the researchers.

The questionnaire consisted of 92 questions subdivided under ten sections. The first and second sections inquired about demographic information such as: age, weight, height, body mass index (BMI). The participants were asked whether they are competitive athlete, had ever used anabolic steroids (yes/no), are you using other drugs beside AAS? (yes/no), academic qualifications, smoking status and finally marital status.

The third section investigated the characteristics of AAS usage including: type (brand name), daily doses, weekly doses, years of usage, frequency of daily usage, frequency of last year usage, pattern of AAS administered and steroid cycle and stacking. The participants were asked the number of times they had used AAS during the preceding 12 months (1 time to more than 50 times), the number of times they had used AAS daily (1 time to more than 4 times), type of the AAS used, the daily dosage taken, the length of the AAS course administered (steroid cycle) (1 week more than 3 month). Also, if they are using stacking method (yes/no) and pattern of AAS administered (oral, injection or cream).

The fourth section was concerned with the reasons why they use AAS. All of the following questions were asked in (yes/no) form; improve physical performance, enhance body image, be admired by others, to compare with other bodybuilders, wanted to be stronger, to protect from other people aggression, how satisfied you are with your body image, do you think you are not muscular enough, lack of self-confidence, wanted to get a great body quickly and the final question, wanted to improve myself in sports.

The fifth section consisted of questions regarding side effects such as; sexual, impotence loss of sexual interest, gynecomastia (breast enlargement), sterility, shrinkage of the testicles (testicular atrophy) and **enlarged prostate. Also,** physical side effects such as; acne, hair loss (baldness), cardiovascular changes, liver and kidney cancer, hair growth, hypertension and increased bad cholesterol level in blood (LDL) and decreased HDL cholesterol. And finally, psychological side effects such as; increased aggression and irritability, insomnia, mental depression and mood changes.

The sixth section comprised information regarding the AAS usage. First, a question was asked if it easy to obtain AAS in Kuwait (yes/no). Then followed by questions to clarified the source of AAS information such as; couches in health clubs, friends, medical physician, college program, TV, physical education classes, newspapers, magazines and finally, internet.

The seventh section was concerned about where the bodybuilders obtained the AAS drugs. The options for the questions were as the following:

physician's prescription, couches in health clubs, friends, local pharmacy internet pharmacy order and international mail order.

The eighth section contained questions asking subjects to identify the locations where bodybuilders administered the AAS. The selections of questions were as the following: at home, health club (inside), health club (outside), street, hospital, pharmacy and medical center.

The ninth section investigated information regarding how and by whom the AAS was administered. The selection were by himself, physician, pharmacist, friend, nurse, couch (trainer) and member in health club.

Finally, the tenth section looked at various sources from which they had received knowledge about AAS and side effects associated with AAS use. These questions included: Are you aware of the future side effects on your health, are you aware of the future side effects on physical performance, have you inquired about the drug before usage, would the knowledge of the side effects prevent the usage, is the drug use encouraged violence and aggression, do you know the drug may cause dependence, are you satisfied with your body image, do you think you are not muscular enough, do you believe there is no harm by using AAS. And lastly, are you aware of the counterfeit products that may be harmful? All questions were asked in (yes/no) form.

Statistical analysis

Descriptive data were calculated for all variables was analyzed using percentages. Kuwaiti bodybuilder's body composition (height, weight and BMI) was calculated as mean, standard deviations (SD) and range.

A probability value of ≤ 0.05 was considered significant. Data were analyzed using the Statistical Package of Social Sciences (SPSS) version 17 (Chicago, IL).

Table 1. Adscription of anthropometric and basic characteristics of recreational Kuwaiti recreational male bodybuilders using illicit AAS (n=50).

Variables	Mean ± SD
Age (yrs)	21.9 ±0.6
Weight (kg)	86.5±7.9
Height (cm)	177.7 ±4.9
BMI (kg/m^2)	27.4±2.6

Note: data are expressed as mean ± Standard deviation. BMI: body mass index

Results

Table 1 summarizes the basic characteristics of participants. The mean age was 21.9 ±0.6 year, body weight (86.5±7.9kg), height (177.7 ±4.9cm), and body mass index (kg/m^2) was 27.6±2.6.

Table 2. Current situation and illicit AAS use by Kuwaiti male recreational bodybuilders also, years of usage, daily doses, frequency, the technique it was used and the type of AAS usage numbers of subjects (n) and percentages (%) (n=50).

Variables	Subjects Number and Percentages
Are you a competitive athlete?	
Yes	10 (20%)
No	40 (80%)
Are you using AAS?	
Yes	50 (100%)
No	0 (0%)

Variables	Subjects Number and Percentages
Are you using other drugs beside AAS?	
Yes	40 (80%)
No	10 (20%)
Highest Level of Education	
High school	1 (2%)
Bachelor	45 (90%)
Higher education	4 (8%)
Marital status	
Single	40 (80%)
Married	8 (16%)
Divorced	2 (4%)
Smoking status	
Yes	17 (34%)
No	28 (56%)
Quit	5 (10%)
Years of usage (year)	
1	17 (34%)
2	23 (46%)
3	6 (12%)
4	3 (6%)
>5 yrs	1 (2%)
Daily doses	
< 50mg	1 (2%)
50-100mg	42 (84%)
> 100mg	7 (14%)
Weekly doses (mg)	
<500	1 (2%)
500-1000	26 (52%)
1000-1500	17 (34%)
1500-2000	4 (8%)
>2000	2 (4%)
Frequency of daily usage	
Once	45 (90%)
Twice	5 (10%)
Frequency of use in past year	48 (96%)
Once	2 (4%)
Twice	
Steroid cycle (week)	
4 wks	26 (52%)
6 wks	22 (44%)
8 wks	2 (4%)
Steroid stacking (y/n)	
Yes	48 (96%)
No	2 (4%)
Pattern administered	
Oral	7 (14%)
Injection	42 (84%)
Cream	1 (2%)

Table 2 shows current status of all subjects in the present study with majority 40 subjects 80% are not comparative athletes. However, all subjects 100% are illicit AAS users with 80% are using one or more drugs. The Kuwaiti recreational male bodybuilders are well educated with 98% have an education higher than high school. As a marital status, most of the subjects 80% are single and only 9% are married. In terms of smoking, more than half 66% are not smokers.

Also, shown in Table 2, two years was the mean number of years where illicit AAS was used by 23 (46%) bodybuilders and the frequency of daily usage of past year was one time by 45 (90%). A daily dose of 50 to 100mg was

most used by bodybuilders 42 (84%) where a weekly dose of 500 to 1000mg was used by 26 (52%) and a dose of 1000 to 1500mg by 17 (34%). Four weeks steroid cycle was the more desirable period by almost half the subjects 26 (52%) followed by 6 weeks 22 (44%).

A combinations of two or more different types of anabolic steroids were taken to achieve maximum effects by 48 bodybuilders, forming a majority of 96%. The majority of 42 subjects (84%) use the intramuscular injection method.

It should be noticed that the most frequently used AAS was Deca-durabolin followed by Dianabol, Depo-testosterone and Winstrol-v (Stanozolol) 50 (100%). Human growth hormone (HGH) was used by 47 (94%).

Table 3 different locations, selection of methods and reasons for illicit AAS usage by Kuwaiti bodybuilders administered the illicit AAS drugs, the subjects numbers (n) and percentages (%) (n=50).

Locations	Subjects Number and Percentages
At home	42 (84%)
Health club (inside)	5 (10%)
Health club (outside)	1 (2%)
Car	1 (2%)
Hospital	0 (0%)
Pharmacy	1 (2%)
Medical center	0 (0%)
Himself	42 (84%)
Physician	1 (2%)
Pharmacist	0 (0%)
Friend	2 (4%)
Nurse	2 (4%)
Locations	Subjects Number and Percentages
Couch (trainer)	3 (6%)
Member in health club	0 (0%)
Improve physical performance	48 (96%)
Enhance body image	50 (100%)
Be admired by others	47 (94%)
To compare with other bodybuilders	48 (96%)
Wanted to be stronger	46 (92%)
To protect from other people aggression	48 (96%)
How satisfied you are with your body image	7 (14%)
Do you think you are not muscular enough?	50 (100%)
Lack of self-confidence	28 (56%)
Wanted to get a great body quickly	48 (96%)
Wanted to improve my skills in sports	10 (20%)
Improve physical performance	48 (96%)
Enhance body image	50 (100%)
Be admired by others	47 (94%)
To compare with other bodybuilders	48 (96%)
Wanted to be stronger	46 (92%)
To protect from other people aggression	48 (96%)
How satisfied you are with your body image	7 (14%)

Different locations where bodybuilders administered the illicit AAS are shown in Table 3. A high percent of 42 (84%) bodybuilders administered the AAS at home, 5 subjects (10%) at health club (inside), only 1 (2%) outside health club and one subject (2%) used inside his own car to administer AAS and another subject (2%) used the pharmacy. Finally none of the subjects used the hospital or medical center.

Also, shown in Table 3, the majority of bodybuilders administered the illicit AAS by themselves at home 42 (84%), only 3 (6%) by coaches. Friends and nurse administered represent only 2% of the subjects and nobody asked a pharmacist or a member

in health club for administering the drug.

In addition, bodybuilders' response to questions concerning reasons for illicit AAS usages also illustrated in Table 3. All of the 50 subjects (100%) responded that enhanced body image was the main reason for illicit AAS usage. The second major reason was to improve physical performance, to compare with other bodybuilders, to protect from other people's aggression and wanting to get a large muscular body quickly 48 (96%). Followed by 46 subjects being admired by others (94%), 46 subjects wanting to be stronger (92%), 28 subjects reported lack of self-confidence(56%), 10 wanted to improve themselves in sports (20%). Finally, when body builders were asked how satisfied they were with their body image only 7 responded (14%). When asked about not being muscular enough, all 50 (100%) of the subjects answered that there are not.

Table 4. Knowledge and awareness of Kuwaiti bodybuilder's illicit AAS users numbers and percentages, numbers (n) and percentages (%) (n=50).

Variables	Subjects Number and Percentages
Sexual	
Impotence	9 (18%)
Loss of sexual interest	17 (34%)
Gynecomastia (breast enlargement)	6 (12%)
Sterility	4 (8%)
Shrinkage of the testicles (testicular atrophy)	1 (2%)
Enlarged prostate	0 (0%)
Physical	
Acne	4 (8%)
Hair loss (baldness)	0 (0%)
Cardiovascular changes	0 (0%)
Liver and kidney cancer	4 (8%)
Hypertension	4 (8%)
Increased bad cholesterol level in blood (LDL).	
Decreased HDL cholesterol	1 (2%)
Psychological	
Increased aggression and irritability	47 (94%)
Insomnia	41 (82%)
Mental depression	12 (24%)
Mood changes	35 (70%)

Bodybuilders' knowledge and awareness toward the use of illicit AAS are presented in Table 8. For sexual knowledge and awareness, the most common side effects bodybuilders have knowledge about was loss of sexual interest by 17 subjects (34%), only 9 (18%) subjects noted impotence and other less knowledgeable facts reported side effects including Gynecomastia (breast enlargement) by 6 subjects (12%), sterility by 4 subjects (8%), shrinkage of the testicles (testicular atrophy) by1 subject (2%) and lastly bodybuilders showed no knowledge about enlarged prostate.

In the meantime, bodybuilders physical knowledge and awareness of AAS was very poor, for example, only 4 (8%) said acne, liver and kidney cancer and hypertension. And demonstrated no knowledge of the cardiovascular

changes, hair loss (baldness) and increased bad cholesterol level in blood (LDL) with decreased HDL cholesterol.

And finally, bodybuilders have more psychological knowledge and awareness. Forty seven 47 (94%) believed that AAS usage increased aggression and irritability, 41 (82%) can cause insomnia and 35 (70%) where aware of mood changes. Only 12 (24%) reported a mental depression.

Table 5. The sources of all information received and where obtained illicit AAS drug by Kuwaiti recreational male bodybuilders, numbers (n) and percentages (%) (n=50).

Variables	Subjects Number and Percentages
Couches in health clubs	47 (94%)
Friends	40 (80%)
Medical physician	31 (62%)
TV	3 (6%)
Physical education classes	3 (6%)
Newspapers	3 (6%)
Magazine	22 (44%)
Internet	46 (92%)
Physician's prescription	5 (10%)
Couches in health clubs	48 (96%)
Friends	48 (96%)
Local pharmacy	31 (62%)
Internet pharmacy order	7 (14%)
International mail order	4 (8%)

The survey contained questions asking subjects to identify various sources they had received information about all forms of illicit AAS drugs are summarized in Table 9.

Of the total bodybuilders AAS users, 47 (94%) reported that their main source of all information including type and side effects acquired from couches in health clubs, followed by the friends 40 (80%). Third sources was the internet 46 (92%) and the medical physician 31 (62%). Sports magazines was another source with 22 (44%). Only 3 (6%) selected TV, physical education classes and newspapers as their sources.

Table 5 also shows the sources where the bodybuilders obtained the drugs, couches in health clubs, friends, local pharmacy, internet pharmacy order and international mail order. Forty eight subjects (96%) stated that they obtained illicit AAS drugs legally from both couches in health clubs and from friends. Local pharmacy 31 (62%) supplied the drugs. International mail order counted for 4 (8%) and only 7 (14%) subjects used the internet to order the drugs. Only 5 (10%) subjects depended on physician's prescription especially for growth hormone.

Table 6. The bodybuilder's knowledge of side effects associated with illicit AAS use, numbers (n) and percentages (%) (n=50).

Variables	Subjects Number and Percentages
Are you aware of the future side effects on your health?	
Y	20 (40%)
N	30 (60%)
Are you aware of the future side effects on physical performance?	
Y	10 (20%)
N	40 (80%)

Variables	Subjects Number and Percentages
Have you inquired about the drug before usage?	
Y	30 (60%)
N	20 (40%)
Would the knowledge of the side effects prevent the usage?	
Y	31 (62%)
N	19 (38%)
Is the drug use encouraged violence and aggression?	
Y	44 (88%)
N	16 (12%)
Do you know the drug may cause dependence?	
Y	9 (18%)
N	41 (82%)
Are you satisfied with your body image?	
Y	9 (18%)
N	41 (82%)
Do you think you are not muscular enough?	
Y	47 (94%)
N	3 (6%)
Do you believe there is no harm by using illicit AAS drugs?	
Y	3 (6%)
N	47 (94%)
Are you aware of the counterfeit products that may be harmful?	
Y	25 (50%)
N	25 (50%)

Table 6 demonstrates that Kuwaiti recreational male bodybuilders illicit AAS drugs users had low awareness percentages 30 (60%) of the adverse effects related to the future use of AAS on their health condition. Twenty (40%) of bodybuilders were aware of the future side effects.

Majority of subjects 40 (80%) repeatedly were aware of side effects on their physical abilities and future performance. Subjects were asked if they inquired about the drug before usage, 30 (60%) answered yes and 20 (40%) answered no. Also, when they asked if the knowledge of the side effects prevent the usage 31 (62%) responded by yes and 19 (38%) reported no. Forty four (88%) believed that the drug use encouraged violence and aggression and 41 (82%) reported that the drug does not cause dependence. One of the very interesting respond to the following questions: are you satisfied with your body image? The answer revealed that 41 (82%) were not. Also, do you think you are not muscular enough? Out of 50 subjects, 47 (94%) responded that they are not and required more muscle. Half of the bodybuilders 25 (50%) did not know that the counterfeit products in the marked that may be harmful?

One of the most interesting responses to the following questions: are you satisfied with your body image? The answer revealed that 41 (82%) were not. Further, researchers asked do you think you are not muscular enough? Out of 50 subjects, 47 (94%) responded that they are not required more muscle. Half of the bodybuilders 25 (50%) did not know that the counterfeit products in the market that may be harmful.

Discussion

The purpose of the present study was to investigate the knowledge and level of awareness among Kuwaiti male recreational bodybuilders (students and members in health club) toward the illicit Androgenic Anabolic Steroids (AAS) use and side effects. The major

finding of the questionnaire in the present study revealed a very low physical, moderate sexual and high psychological level of knowledge and awareness.

High percentage of Kuwaiti male recreational bodybuilders are young with an average age of 19.9±0.6, thus this an indication of the severity of the problem where at the early age bodybuilders may lack the necessary information regarding illicit AAS usage.

Even though hard effort was made to recruit as many as subjects to participate in the present study especially from private health clubs yet many declined for different reasons. Therefore, the prevalence of the bodybuilders was not reported. However, one can observe the large number of bodybuilders in these private clubs. In addition, (Al Shammari et al., 2009) in their cross sectional study recruited 229 bodybuilders from 20 male health clubs in Capital and Hawalli province. The authors suggested that the overall prevalence of anabolic steroids use among Kuwaiti bodybuilders was 57.8% also they found that the knowledge regarding anabolic steroids side effects use was low which was in an agreement with the present study findings. In the United State, the AAS usage among high school students ranged between 4-12% (Potteiger and Stilger 1994, Sjoqvist et al., 2008). In the most recent study 2013, (Harrison et al., 2013) fond the prevalence among Americans using AAS before age 20 was 22%. A national survey was conducted using a self-report questionnaire distributed randomly to schools within each of five Canadian regions. Melia et al., 1996, reported a 2.8% of the respondents were AAS users however, they added that the AAS usage is more widespread than may have been assumed. In the present study, we reported a high percentage 82% of responded to the questionnaire.

Tahtamouni et al., 2008, reported a 4.2% and 26% of Jordanian collegiate students and athletes using AAS, respectively. Also, in Jordan, (Wazaify et al., 2014) in more recent study 2014 they investigated the abuse of over the counter products (e.g. growth hormone and thyroxine) by 375 gym clients in gymnasiums in Amman. A total of 31 (8.8%) clients admitted to using anabolic steroids and other hormones to increase muscular power or build muscle mass. This is a very low number of users which may not reflect the real situation.

Habeeb et al., 2012, recruited 172 bodybuilders AAS users from several fitness centers in Baghdad city (Iraq). They reported that less than half of the study participants used AAS. Al-Falasi et al., 2008) used a cross sectional survey among gym users of 18 randomly selected gyms in Al-Ain city during May, 2006. Their study showed a very high prevalence of AAS (22%). In Islamic Republic of Iran, (Nakhaee et al., 2013) conducted a cross-sectional study among body building athletes referring to gyms located in Kerman, Iran. Five gyms were selected randomly and 380 athletes were invited to complete a self-administered anonymous questionnaire. Based on self-reports, the prevalence of AAS use was 24.5%.

Anthropometric data:

Due to the usage of AAS and other types of drugs, the Kuwaiti recreational male bodybuilders AAS users showed an increase in body weight and higher BMI values 27.6±2.6 which was less than the average general Kuwaiti male population (31.4±2.9). Despite this result, mean BMI was greater than typical recreational male bodybuilders (26 ±2) but less than fully trained elite international bodybuilders

AAS users (31±3). The elevated value of BMI for Kuwaiti recreational male bodybuilders is may be due to an increased muscle tissue causing an increase in body weight.

According to the National Institutes of Health provided the following criterion: a BMI of 25 to 29.9 is categorized as overweight where the Kuwaiti recreational male bodybuilders in the present study fall in this category, a BMI of 30 or above is categorized as obese. From Dietary Guidelines provided by the US Department of Agriculture and the Department of Health and Human Services (2000), individuals with a BMI of 18.5-25.0 are considered healthy, 25.0-29.9 are considered overweight and a BMI greater than 30.0 are considered obese (WHO, 2004).

Even though the majority of the bodybuilders 45 (90%) are well educated with at least bachelor degree yet they still smoke and use other drugs in combination with current the illicit AAS drugs.

Types and pattern of AAS usage by Kuwaiti male recreational bodybuilders:

The average years of AAS usage by Kuwaiti male recreational bodybuilders in the current survey were similar to other bodybuilders (2 years) however, they are taking larger daily doses (> 500mg), with more than half the respondents using a weekly anabolic steroids dose in excess of 1000 mg combined with other drugs such as growth hormone. These high doses was in agreement with a study results reported by Parkinson and Evans, 2006) were 298 of 500 (59.6%) bodybuilders surveyed reported using at least 1000 mg of testosterone or its equivalent per week. They also reported that these high doses may cause severe health problems hence 99.2% (496/500) of users reported subjective side effects from AAS use.

Their anabolic steroid cycle also have almost the same time period ranged between 4 wks to 6 wks which is similar to other bodybuilders, moreover 48 out 50 subjects are using another drug (steroid stacking). AAS drugs are often abused in patterns called "cycling," which involve taking multiple doses of steroids over a specific period of time, stopping for the body to rest, and then restarting again. Users also frequently combine several different types of steroids in a process known as "stacking.". Abusers think that the different steroids interact to produce an effect on muscle size that is greater than the effects of each drug individually, a theory that has not been tested scientifically (Kanayama et al., 2010, Sjoqvist et al., 2008).

According to the questionnaire data, the most commonly used AAS is Deca-durabolin, Winstrol-V and Depo-testosterone in both injection and tablets form. Growth hormone is also a choice of many users. Deca Durabolin, which is also known as Deca, is one of the best performance enhancing drugs and it is also used commonly as stack by bodybuilders with combination of steroids.

Human growth hormone (HGH) was used by 47 (94%). HGH is a powerful anabolic hormone that affects all body systems and plays an important role in muscle growth. Many side effects associated with HGH usage include insulin resistance, hypertension, cardiomegaly, ventricular hypertrophy, and abnormal lipids with excessive use (Hoffman et al., 2009). It should be noted that the evidence about HGH enhances sports performance is insufficient (Dean, 2002).

It seems that majority of bodybuilders Kuwaiti male students and health club members administered the

AAS drugs at home 42 (84%) where they feel comfortable and have sense of privacy. The preferred methods of administering AAS was by themselves 42 (84%). There is a less risk of infection and contamination of bodybuilders use the injection method by themselves to control the syringe (quality, content, and sterility).

In terms of drugs sources, the bodybuilders believed that they can obtain AAS from different local sources with no difficulties as a result, 48 (96%) subjects reported they obtained the drugs from couches and trainers in health clubs and local pharmacy. This is one of the reason why government should regulate, control and prevent the AAS drug usage also these drugs maybe counterfeited and may cause health problems for users. In addition, to supervise the pharmacies in their way of distribution drugs without a physician prescription.

Kuwaiti bodybuilders illicit AAS users obtained all information (type and side effects) by couches in health clubs 47 (94%), internet 46 (92%) and friends 40 (80%), respectively. This could be a major problem since these sources may not have the proper knowledge of these drugs and related side effects and may advertise their products only for financial profit.

The most concerned answers regarding the male Kuwaiti bodybuilders use the AAS were when they responded to the following questions, How satisfied you are with your body image? Only 9 (18%) answered that they are. Their responded to the next question; Do you think you are not muscular enough? Forty seven (94%) of the subjects answered no, this is a very alarming situation which may lead to addiction and thus serious health consequences. Almost half of the Polish bodybuilders reported

Same number and percentage 47 (94%) believed that the drug does not cause dependence and there is no harm by using illicit AAS. Despite that the knowledge of the side effects associated with AAS usage, would having more knowledge of the AAS side effects prevent future use? Still large number of the subjects 19 (38%) reported no. Finally, nearly 100% of anabolic steroids users experience subjective side effects suggests that concern over health risks does not influence the patterns of drug use (Sagoe, 2014).

In addition, a significant number of counterfeit products are sold as anabolic steroids by couches and trainers in health clubs and local pharmacy, yet half of the subjects of 25 (50%) were aware that these drugs are harmful.

Knowledge and awareness:

The findings in the present study importantly contributes to our understanding of the knowledge and awareness regarding Kuwaiti recreational male bodybuilders illicit AAS usage and its adverse effects.

The knowledge and attitudes of bodybuilders about the problem of illicit AAS using and abusing has been the subject of research of many authors. (Al-Falasi et al., 2008, Bahrke et al., 2000, Baker et al., 2006, Habeeb et al., 2012, Kanayama et al., 2010, Kersey, 1996, Melia et al., 1996, Parkinson and Evans, 2006, Rachon et al., 2006, Tahtamouni et al., 2008, Wanjek et al., 2007). For instance, (Parkinson and Evans, 2006) surveyed 500 anabolic androgenic steroids users, finding that nearly four out of five AAS users are nonathletic who take these drugs for cosmetic reasons by reducing body fat and increasing muscle size. This finding confirmed that major reason for Kuwaiti male recreational bodybuilders to use AAS is to improve body image.

The adverse effects and potential dangers of illicit AAS use (depending on the length of drug abuse) have been well documented (Bonetti et al., 2008, Hartgens and Kuipers, 2004,. Kicman 2008, Kishner, 2013). Side effects of anabolic steroids include kidney impairment or failure, cardiovascular problems including enlargement of the heart, high blood pressure, and changes in blood cholesterol leading to an increased risk of stroke and heart attack, hepatic dysfunction, and psychiatric and behavioral disturbances (Achar et al., 2010, Baggish et al., 2010, Kindermann 2006, Sculthorpe et al., 2012, Vanberg and Atar 2010). Major personality changes may occur, evident by increasing aggressiveness and intensity that may lead to intense anti-social or psychotic behavior such as "road rage" especially with adolescents (Augustus et al., 2010, Koltz et al., 2007, Nagelkerke et al., 2008, Skarberg et al., 2010). The most important long term adverse effects were lower fertility and the impairment of lipid profile associated with an increased cardiovascular risk (Bonnetti 2008). In addition, more serious psychological consequence of AAS usage is muscle dysmorphia which is a disorder were a bodybuilders become obsessed with the idea that they are not muscular enough. Majority of bodybuilders suffer from muscle dysmorphia tend to hold delusions that they are "skinny" or "too small" but are often above average in musculature (Babusa and Tury, 2012, Goldfield and Woodside, 2009).

Anabolic-androgenic steroids are illegal for use in the State of Kuwait and many other countries such as U.S. and Canada without a doctor's prescription and supervision. There are well over 100 different varieties of anabolic-androgenic steroids in use. In addition, the illicit AAS are usually used in combination with other doping agents such as erythropoietin, growth hormone and thyroxin (Brennan et al., 2011, Calfee and Fadale 2006, Eichner 2007, Harrison et al., 2013, Liu et al., 2008, Meinhardt et al., 2010).

There are at least 100 health clubs, gymnasiums and fitness centers in Kuwait where members can train for cardiovascular and weightlifting (bodybuilders). There is no bodybuilder's federation in Kuwait to neither regulate nor supervise this type of sport. Young athletes and non-athletes join many private health clubs in Kuwait in order to enhance performance and body images. However, the majority of these health clubs are managed by unqualified staffs that encourage the use of illicit AAS disregarding the consequences. Therefore, the use of anabolic steroids and other pharmacological agents is widespread. Finally, one of the major concerns is that recreational bodybuilders using counterfeit drugs sold from different sources, specifically from internet orders and the severe health and mental consequences that may occur with their usage (Maravelias et al., 2005).

Anabolic steroids come in different shapes, forms, sizes, and colors. There are more fakes/counterfeit steroids on the market than there are legitimate/real steroids. Fakes drugs are sold because they are cheap to make and easy to sell. Anabolic androgenic steroids are commonly found on the black market and there is a high demand among recreational bodybuilders and nonathletic population. These drugs predominately modified in oil based injectables and may contain other substances (Outterson and Smith, 2006). The orders can be easily purchased from the black market in several countries such as Thailand, Turkey, Bulgaria, India, Sri Lanka, Egypt, Pakistan, Iran,

Australia and China (Sagoe et al., 2014).

A very low percentage of bodybuilders were aware of the adverse effects associated with illicit AAS usage, especially the effect on sexual behavior and physical problems, but their knowledge of psychological and mental consequences of long term illicit AAS usage was high. The above findings were similar to the results of study by (Al-Falasi et al., 2008, Habeeb et al., 2012, Nakhaee et al., 2013, Parkinson and Evans, 2006, Tahtamouni et al., 2008). Most of bodybuilders knew the great benefits of AAS usage in their physical appearance. In addition, 20 (40%) of the bodybuilders AAS users knew the negative effects of the future use on their health and physical ability.

The high level of psychological knowledge about illicit AAS usage could be associated with the 2012 statistics in the State of Kuwait showed an increase in car accident and death due to speeding; disrespect the road laws, aggressiveness and driving under the influence of drugs (Kuwait time newspaper 2012). The United Nation Development Programme and World Health Organization reported in 2005, there were 28.8 fatalities per person, with a population of 2.3 million and the number of vehicles were 754,000 in comparison with Egypt where the population was 76.1 million and the number of vehicles 2,300,000, however the number of fatalities was much less with only 10.4 per 100,000 people (Mohammed and Hajeeh, 2012, WHO 2004). A total of 227 people were killed in more than 44,000 accidents reported in Kuwait during the first half of 2012, which saw the fatality rate increase by 25 percent compared to the first six months of the last year (Kuwait time newspaper 2012). This could be one reason why 44 (88%) of the subjects believed that the drug use encouraged violence and aggression.

These findings suggest that a joint effort from ministry of health, ministry of education, department of internal affair commerce and public authority for sports and youth must be organized to deal with the risks associated with illicit AAS usage. In addition, a program should be designed to educate young athletes regarding the negative effects of present and future illicit AAS usage. Also, experienced bodybuilders should come forward and discuses their experience that occurred to their body as the result of long term AAS usage. High schools and health clubs should be use as educational setting to educate students and athletes.

The findings also indicate the need for preventive measures and improvement of specific knowledge of doping among students and bodybuilders and their attitude towards doping must be changed in order to increase their awareness toward using androgenic anabolic steroids. Drugs awareness should be part of the school curriculum especially in high school and university. This research can serve as a framework for the same or similar types of research to increase the awareness and prevent the use of AAS among Kuwaiti male recreational bodybuilders.

Conclusion

Kuwaiti male recreational bodybuilder's anabolic steroids users are non-athletes who take these drugs generally for improving physical appearance and body image. The Deca Durablin was their AAS drug of choice

where they been use in it for an average of 4 years with amount much higher than the save amount recommended. They also use other drugs in combination with AAS. Human growth hormone (HGH) was used by 47 (94%). They administer the drug at home and by themselves. Their knowledge of illicit AAS and side effects was very limited and if there was any would be received from their friends. The drugs availability in Kuwait is very easy attainable.

The findings of this investigation could be used to develop educational programs for bodybuilders illicit AAS users in both university campus and private health club. In addition, continuous education should be offered to reduce the factors that encourage AAS usage. Also, firm legislation against possession of AAS should be implemented by different governmental agencies such as Ministry of Health, Ministry of Interior and Ministry of Education.

Acknowledgement

The authors wish to thank all students, members of health clubs and coaches involved for their participation in the current study.

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