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Awareness and Frequency of using Lifestyle Medications among University Students in Kurdistan Region-Iraq

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Abstract

Life style medications (LSMs) are used for the improvement of lifestyle of an individual. These drugs are being taken to modify a non-medical or non-health-related purpose. This study aimed to investigate the extent of using LSMs among university students, reasons for using them, and identify the types, adverse effects to provide helpful information for justification and prevention of this phenomenon. A descriptive observational cross-sectional study was conducted. A questionnaire was designed to target undergraduate medical and pharmacy students at three universities of Sulaimani (UOS), Hawler Medical University (HMU), and University of Duhok (UOD) in Sulaimani, Hawler, and Duhok Cities-Kurdistan Region-Iraq respectively. Student knowledge, awareness of the use of LSMs, the motivations for using these medications were assessed by addressing these aspects in different sections of the questionnaires. The Number of respondents was 209 from which, the number of students who were using LSMs was 149 (71.3%). The source of information on LSMs among those who had aware of using LSMs was advertisement 25(12%), family 28(13.4%), friends 51(24.4%), medical needs 51(24.4%), internet 115(55%) and the pharmacies 4(1.9%). The most frequent agent that has been used by the highest number of the students was caffeine 71(47.7%), followed by dietary supplement 63(42.3%) then cosmetics 48(32.2%). 135 (64.6%) students did not agree on the prevention of the use of LSMs, while the rest 74 (35.4%) encouraged the prevention of LSMs intake by providing many strategies to prevent this phenomenon. In conclusion, prevalence of using LSMs among university students is high and tendency for medicalization of healthy individuals in the aim of better academic performance and improve quality of life is increasing. The prevention of LSMs intake by providing many strategies to prevent this phenomenon was raised by 74 (35.4%) of the participants.

Key words: Life style medications, LSMs, Motives, Prevention strategies, University students

الوعي و تكرار تناول الأدوية النمط الحياة بين الطلبة الجامعات في الاقليم الكردستان-العراق

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الخلاصة

تعتبر ادوية نمط الحياة من الأدوية التي تستخدم لتعزيز نمط حياة الفرد. يتم تناول هذه الأدوية لتحسين غرض غير طبي وغير متعلق بحالة المرضية. إن الهدف من إجراء هذه الدراسة هو معرفة مدى استخدام الأدوية نمط الحياة بين طلبة الجامعات ودوافع استخدامها والتعرف على أنواعها وتأثيراتها السلبية لجمع البيانات المفيدة على هذا الموضوع من أجل تزويد الجامعات بمعلومات قيمة لوضع الضوابط والوقاية من تناولها بين طلبة الجامعات. أجريت دراسة وصفية مقطعية مستعرضة من خلال تصميم استبيان الذي استهدف طلبة المجموعة الطبية منها طلاب وطالبات الكليات الطب والصيدلة في جامعة السليمانية و جامعة هولير الطبية و جامعة دهوك في المحافظات التالية، السليمانية، أربيل و دهوك على التوالي. تم تقييم مدى معرفة الطلاب للأدوية ووعيهم لاستخدام هذه الادوية من خلال الأسئلة الموجودة في الأقسام المختلفة في الاستبيان. استجاب للاستبيان ٢٠٩ طالبا. عدد الطلاب الذين كانوا يستخدمون أدوية نمط الحياة هو ١٤٩ (٧١,٣٪) بينما ٦٠ (٢٨,٧٪) لم يستخدموا هذه الادوية على الاطلاق. تبين بان مصدر المعلومات لهذه الادوية بين أولئك الذين كانوا لديهم علم لهذه الادوية هومن خلال الإعلانات ٢٥ (١٢٪)، الأسرة ٢٨ (١٣,٤٪) ، الأصدقاء ٥١ (٢٤,٤٪) ، من الأحتياجات الطبية ٥١ (٢٤,٤٪) ، من الانترنيت ١١٥ (٥٥٪) ، والصيدليات ٤ (١,٩٪). المادة الأكثر شيوعا استخدامه من قبل الطلاب هو الكافيين ٧١ (٤٧,٧٪) ، يليه المكمل الغذائي ٦٣ (٤٢,٣٪) ثم المستحضرات التجميل ٤٨ (٣٢,٢٪). لم يتفق ١٣٥ (٦٤,٦٪) من طلاب المشاركين على منع استخدام أدوية نمط الحياة بينما أيد الباقون ٧٤ (٣٥,٤٪) على منع تناول هذه الادوية من خلال وضع عديد من الاستراتيجيات لمنع هذه الظاهرة . نستنتج من هذه الدراسة بان نسبة استخدام أدوية نمط الحياة بين طلبة الجامعات عالية جدا والميل الى تناول الادوية من قبل الأشخاص الاصحاء لغرض تحسين أدائهم الأكاديمي وتحسين نوعية الحياة في الازدياد. لقد تم الاقتراح عديد من الاستراتيجيات من قبل نسبة من المشاركين ٧٤ (٣٥,٤٪) لمنع هذه الظاهرة .

الكلمات المفتاحية: أدوية نمط الحياة، دوافع الاستخدام، طرق الوقاية، طلبة الجامعات.

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Introduction

The term lifestyle medication (LSM) has multifaceted definition and various descriptions are frequently used interchangeably for this term as there is incomplete consensus on its definition, types, indications and its access. [1,2] However, general consensus has agreed on the medications that are intended for improvement of lifestyle of an individual. These drugs are being taken to modify a non-medical or non-health-related purposes. It can be used to alter the appearance as well as the physical and mental capabilities of the individual such as improving academic performances, changing and/or improving physical appearance. These drugs as named as non-essential drugs that used to manage non-serious medical issue which is non-life threatening and non-painful status such as indicated for baldness, erectile dysfunction or impotence, postpone menstruation, muscle building, physical, mood alteration, acne, and wrinkle. [1,3]

There are many medications and pharmaceutical products that are considered as LSMs, these include drugs that are utilized for hair loss prevention such as: minoxidil, finasteride or hair tonics; orlistat for losing weight; bupropion for smoking cessation, sildenafil for erectile dysfunction, onabotulinumtoxin A for wrinkle and aging marks; melatonin as a sleep aid; cyproheptadine as appetite enhancer and dietary supplements that may improve physical appearance. [4] These medications are taken in an attempt to improve personal life quality rather than to manage a medically identifiable and well-defined disease [5] Today, the use of lifestyle medications is increasing due to easy accessibility and persuasive advertisement of pharmaceutical products such as cosmetics, dietary supplements, and weight-loss products which increases the concerns of misuse of these medications. [6]

Additionally, disease mongering which is defined as maximizing minor illness into severe medical issue, treating mid illness as serious one, all these have increased the medicalization of these conditions. [7] On the other hand, university student's living environment, socio-economic factors, modernized life and peer pressures are considered as the factors that make students to be at high-risk for using LSMs. [8] The issue of LSMs usage have been investigated in many studies and there have been some reports about the prevalence of LSMs usage among students and healthy people. [4,9] Rahman *et al*, 2010 stated that lifestyle has itself become an object of medical attention and the impact of these medications on the society need to be more elaborated [1].

Moreover, the majority of the students who were LSMs users confessed that most of LSMs were unnecessarily used. [4]

Unfortunately, these LSMs are not without adverse effects thus the development of preventive strategy and educational awareness for reducing the use of LSMs requires information on the most commonly used medications among students. Furthermore, factors for using these drugs and prevalence of the usage of these medications in the university environment should be addressed. [9] Therefore, the aims of this study were to investigate the extent of using lifestyle medications among university students, motives for using them, and identify the types, adverse effects and other measurable outcomes to provide helpful information for justification and prevention of this phenomenon.

Methods

Study design and development of the questionnaire

This was an anonymous descriptive cross-sectional on-line survey where a multiple-choice with single word answer questionnaire was designed to target undergraduate medical and pharmacy students at the University of Sulaimani, Hawler Medical University, and University of Duhok in Sulaimani, Hawler, and Duhok Cities-Kurdistan Region-Iraq respectively from June 2020 to January 2021. A self-administered questionnaire was used in this study, which was designed after extensive literature review. [4,10]

The questionnaire was divided into four sections and it was utilized for collection of socio-demographic characteristics, knowledge on LSMs, the most commonly used LSMs and preventive measure for LSMs practice.

A pilot study was conducted among ten medical and pharmacy students to assess the understandability, reliability, and clarity of the questionnaire. Validation of the questionnaire was performed by face validity based on an expert panel from pharmacists and biostatisticians. The purpose of the research has been clarified for the students and the researchers assured them of their information confidentiality. The students also have been informed on how to fill this questionnaire.

Demographic information included age, gender, university and colleges and the current academic year of the student.

The questionnaire was sent out via email to the students at the targeted colleges through the college representative member. Student knowledge, awareness of the use of LSMs, motives for using these medications were assessed by addressing these issues in different sections of the questionnaires.

Objectives of the study was explicitly described at the beginning of the questionnaire form to each participant.

Inclusion and exclusion criteria

The sampling scheme included undergraduate university students of both gender, age of 18 and above years, residing at the university campuses in the three cities; Sulaimani, Hawler, and Duhok Cities-Kurdistan Region-Iraq. The questionnaire has sent to the levels from 2nd year to the last year of the academic study. The survey included students who were using prescription and non- prescription medications without a medical diagnosis. Postgraduate students and students who were identified as users of these medications to treat serious and chronic diseases have been excluded.

Ethical consideration

The project of the study was registered and approved by the Ethics and Research Registration Committee of the College of Pharmacy–University of Sulaimani with Registration number (PH-17-20 in 15.11.2020). Consenting students was also assured for confidentiality of the volunteered information; thus, the study designed as anonymous on-line survey without name and personal details of the students.

Statistical Analysis

Analysis and graph of the data were performed in GraphPad Prism version 9.3.1. Descriptive statistics; frequency, percentage, confidence intervals, minimum and maximum range, graphs,
were conducted for data presentation.

Results

Basic characteristics of the participants

The recommended sample size for the current study was calculated based on a formula that was described in a previous research with modification. [11] The Number of responses was 215 which is 66.5% of the recommended sample size, six responses have been excluded as they were postgraduate students and were using prescribed medications. The included students from the three universities were 209. Basic characteristics of the participants is illustrated in Table 1. Half of the responses 104(49.8%) were obtained from University of Sulaimani while 79(37.8%) were from University of Duhok and 26 (12.4%) students were from Hawler Medical University. The majority of the respondents were female (70.3%). Most of the respondents were from third and fourth grade (56%, 66%) respectively. Nearly three quarters of the students 152 (72.7%) were with the age range between (18-21), 50(24%) students were with (22-2٤) and 7(3.3%) were 25 years and above. About two-third of the students 161 (77%) were living inside the cities while the rest 48 (23%) were from rural areas.

Table 1. Demographic characteristics of the participants n=209

	Frequency	%
Universities of the participants		
University of Sulaimani	104	49.8
Hawler Medical University	26	12.4
University of Duhok	79	37.8
Gender		
Female	147	70.3
Male	62	29.7
Age (Year)		
18-21	152	72.7
22-2٤	50	24.0
25 and above	7	3.3
Year of the study		
2nd	47	22.5
3rd	56	26.8
4th	66	31.6
5th	40	19.1
Place of living		
Urban area	161	77.0
Rural area	48	23.0

Knowledge, source of information and student's attitude on LSMs

Majority of the students 144(68.9%) were aware of LSMs intake, while around one third 65(31.1%) had never heard about LSMs. The source of information on LSMs among those who had aware of using LSMs was advertisement, family, friends, medical needs and rarely from the pharmacies 4(1.9%) while highest number of the students 115(55%) were obtained information on LSMs from internet. Table 2 shows the number of students who were using LSMs.

The frequency of using LSMs and number of the drugs per students was also calculated as shown in Table 2. The majority of the participants 112(53.5%) were using one LSMs, and 39(18.6%) were not using any LSMs.

The current study also elaborated on the purpose and benefit of using LSMs among students by providing multiple options in the questionnaire. The perception of the students on the purpose of LSMs usage varies and the majority of the students were using LSMs as a tonic for improving their health (26.3%) and to alleviate stress (21.5%). Furthermore, some of them use LSMs as cosmetics (13.4%), to increase immunity (9.6%) , treat minor condition (8.1%), for improvement of physical appearance and as body builder (1.4%)(Figure.1).

Table 2. Awareness and information on LSMs among university students n=209

Knowledge on LSMs	Frequency	%
Students have information on LSMs	144	68.9
Students have never heard about LSMs	65	31.1
Sources of information on LSMs		
Advertisement	25	12.0
Family	28	13.4
Friends	51	24.4
Medical needs	51	24.4
Internet	115	55.0
Pharmacy	4	1.9
Students use LSMs		
Number of students using LSMs	149	71.3
Number of students not using LSMs	60	28.7
Number of LSMs used by the students		
0	39	18.6
1	112	53.5
2	42	20.0
3	10	4.8
more than 3	6	2.9

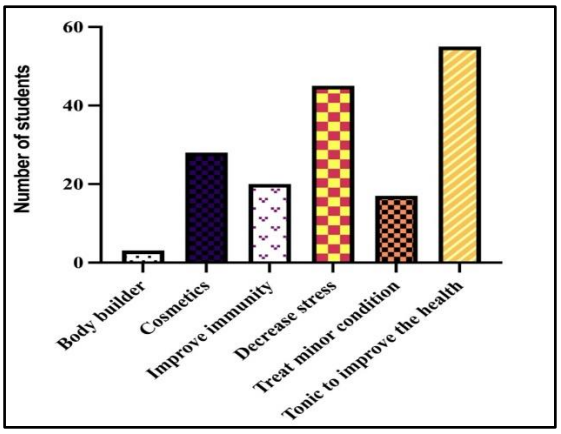

Figure 1. Purpose and benefit of using LSMs.

The most frequently used LSMs, adverse effects associated with the use of LSMs

This study has recorded the frequency of the drugs that have been taken by all the students during their lifetime. Table 3 has summarized the most frequently used LSMs used by the students in the studied colleges.

Table 3. The most frequently used LSMs by the university students

Life Style Medications (LSMs)	Number	%	95% CI
Alcohol	5	3.4	(0.46, 6.25)
Dietary Supplement	63	42.3	(34.35, 50.21)
Antioxidants	23	15.4	(9.63, 21.24)
Benzodiazepines	7	4.7	(1.3, 8.1)
Caffeine (Caffeinated products)	71	47.7	(39.63, 55.67)
Beta-Blockers for alleviate anxiety and social phobia (Propranolol, Atenolol)	18	12.1	(6.85, 17.31)
Bupropion “stop smoking”	3	2.0	(0, 4.27)
Nicotine replacement therapy	5	3.4	(0.46, 6.25)
Cosmetics (skin depigmenting agents)	48	32.2	(24.71, 39.72)
Cyproheptadine (Appetite stimulant)	11	7.4	(3.18, 11.58)
Hair loss prevention (Alopecia) agents	25	16.8	(10.78, 22.78)
Melatonin	20	13.4	(7.95, 18.9)
Norethisterone or contraceptive pill as a “period delay pill” like for Ramadan or any other private occasion	6	4.0	(0.87, 7.18)
Orlistat “any other weight reduction pills”	15	10.1	(5.24, 14.9)
Stimulants (Amphetamines, Modafinil, Methylphenidate)	10	6.7	(2.69, 10.73)
Vitamin C	3	2.0	(0, 4.27)
Anabolic Steroid	3	2.0	(0, 4.27)
Fluoxetine	1	0.7	(0, 1.98)

The most frequent agent that has been used by the highest number of the students was caffeine 71(47.7%), followed by dietary supplement 63(42.3%) then cosmetics (skin depigmenting agents) 48(32.2%). Only one (0.7%) student was using a prescription drug without medical diagnosis as LSMs for alleviating stress. The other common LSMs are summarized in table 3. Furthermore, the adverse effects associated with LSMs intake is summarized in Table 4. Headache and/or mood changes, dryness of mouth, drowsiness or insomnia as well as nausea and vomiting are the most repetitive adverse effects that have been experienced and recorded by the students. In another part of the study, opinion of the student on the effect of LSMs on drug-drug interaction and possibility of side effect potentiation have been recorded as shown in Table 5. Half of the students 106(50.7%) believed that LSMs lead to Drug-Drug interaction and the possibility of side effects are increased.

Table 4. The most common adverse effects associated with the use of LSMs experienced by the university students

Adverse effects	Number	%	95%Cl
Constipation and/or stomach upset	15	10.1	(5.24, 14.9)
Diarrhea	24	16.1	(10.2, 22.01)
Dizziness or agitation	20	13.4	(7.95, 18.9)
Drowsiness or insomnia	34	22.8	(16.08, 29.56)
Dryness of mouth	38	25.5	(18.5, 32.5)
Facial hair growth and/or hormonal disturbance	24	16.1	(10.2, 22.01)
Fatigue and/or sedation	18	12.1	(6.85, 17.31)
Headache and/or mood changes	43	28.9	(21.58, 36.13)
Loss of appetite	30	20.1	(13.7, 26.57)
Nausea and vomiting	32	21.5	(14.88, 28.07)
Steatorrhea	15	10.1	(5.24, 14.9)
Stinging and/or dermatitis	5	3.4	(0.46, 6.25)
Weight gain	20	13.4	(7.95, 18.9)

Table 5. Perception of the students for the impact of LSMs- drug interaction and potential side effects

Type of Response	Number	%	95% Cl
Students believed that LSMs May lead to Drug-Drug interaction	84	40.2	(48.41, 64.34)
Students believed that LSMs do not lead to Drug-Drug interaction	19	9.1	(7.4, 18.11)
Student believed that LSMs definitely lead to Drug-Drug interaction	106	50.7	(63.87, 78.42)

Motives or factors enhancing the use of LSMs among students

The highest response on the motives that are enhancing the use of LSMs was associated with the treatment of non-serious minor condition 82 (39.2%) then social media or TV advertisement 49 (23.4%). The other factors that boost the use of these medications have illustrated in Figure 2.

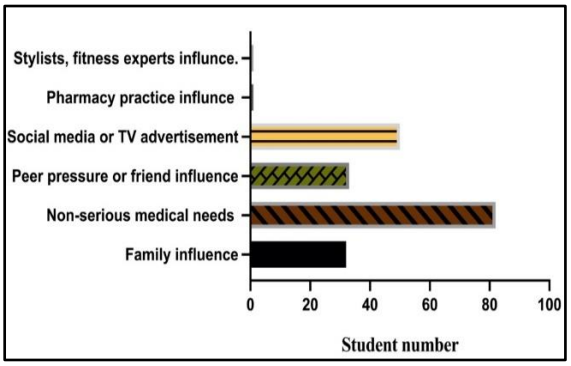

Figure 2. Motives enhance the use of LSMs among students

Students perception on the effects of LSMs on quality of life

Table 6 depicts the students' perception about the effects of using LSMs on the individual's quality of life. The majority of the students 107 (51.2%) were disinterested upon the impact of LSMs on quality of life, while 67 (32.1%) and 13(6.2%) agreed and strongly agreed on the intake of LSM respectively, because they believed that LSMs can improve the quality of life of the individuals. The rest either strongly disagreed or disagreed on the use of LSMs for the purpose of quality of life improvement.

Table 6. Perception of students toward using LSMs to improve quality of life

Type of Response	Number	%	95% CI
Agree	67	32.1	(36.98, 52.95)
Disagree	14	6.7	(4.71, 14.08)
Neutral	107	51.2	(64.59, 79.04)
Strongly Agree	13	6.2	(4.19, 13.26)
Strongly disagree	8	3.8	(1.75, 8.99)

In the last part of the survey, the preventive measure for LSMs intake was elaborated therefore, students' opinion on prevention of LSMs has been collected. 135 (64.6%) students did not agree on the prevention of the use of LSMs, while the rest 74 (35.4%) encouraged the prevention of LSMs intake by providing many strategies to prevent this phenomenon. Among those methods self-education about their side effects 83(39.7%), providing college counsellors 33(15.8%), establishing university on-campus counseling centers 32(15.3%), social media and TV advertising regulation 31(14.8%) and mass media campaigns 15(7.2%) have been mentioned by the students as shown in Figure 3.

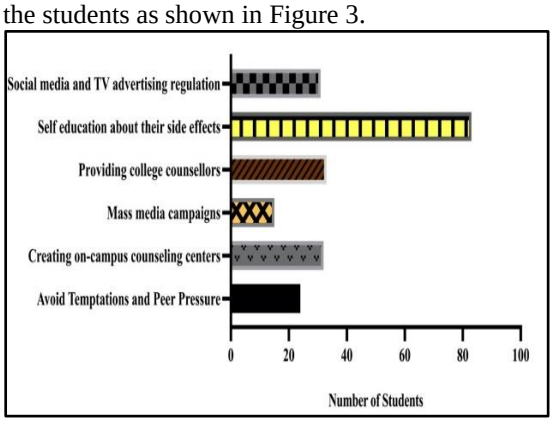

Figure 3. Prevention strategies for the use of LSMs among university students

Discussion

The change in lifestyle gave rise the emergence of various medications that address the aspects of quality of life and lifestyle of individuals, therefore

the use of these medications without medical diagnosis or as off-labeled drugs raises a public, ethical and safety concerns. [12] They also have a significant unfavorable socioeconomic and safety impact on public health and society especially in developing countries. [10]

University students are a diverse group of relatively healthy individuals who are subjected to lifestyle and physical change. Within the first year of university, students report an increase in body weight and body fat due, in part, to the changes in their diet and the stress of the new university environment [13] thus, they might be more prone to use LSMs. The present study demonstrated the prevalence of using LSMs among university students in three universities. It has revealed that three quarter of the participants were using those medications during their lifetime with the intention to either improve their immunity and wellbeing or to decrease stress for better academic performance. These purposes were also stated by a study conducted in Tokyo on the Japanese students who were registrants of Macromill Inc and their age was between 18-24 years old. The students experienced high prevalence of consumption of these medications. [14]

Clear differences in the prevalence of LSMs between and within the countries have been reported for example a study in an Australian university revealed that 75.5% of the students used stimulants to enhance academic performance while US data from a systematic review displayed a range between 5% and 35% of non-medical use of the stimulants by university students [15] .

In the present study, the most common life style substances used among the participants was caffeine (47.7%) followed by dietary supplement (42.3%) and cosmetics (32.2%). The finding of the present study in the context of caffeine consumption is consistent with other studies which conducted in some universities such as Egypt, Lebanon and United State. [16,17,18] Caffeine is the most consumed psychoactive drug in the world, as a psychostimulant. It shows all the pharmacological properties of classical psychostimulants, such as cocaine and amphetamine. An epidemiological study on caffeine withdrawal and dependence indicated that regular caffeine intake creates dependence, which in part depends on withdrawal symptoms. [19]

Perceptions for consuming caffeine among university students in the previous studies were feeling of alertness, improved performance, attention in task performance, concentration, improved long-term memory and faster locomotors speed [20,21] feeling of energy and capability to do work for long periods of time after taking caffeine. The perceptions for not taking caffeine were irritability, increasing heart rate, bad feelings, and insomnia. [22]

The popularity of consumption of the caffeinated products associated with the food related social behaviors, individual habits and hereditary traits. [18] Literature suggests that the consumption of caffeine among young people is significantly high all over the world and different caffeinated products are easily accessible. [23] Approximately 90% of the college students in United States are using caffeine [18] and in another study conducted among students of Dutch university a daily consumption of caffeine

was 87.8%. [24] In addition, the consumption of caffeine products among Canadian young people was found to be 73.6% and approximately one in six consumers had exceeded the usual guidance for maximum daily consumption thus potentially increasing their risk of experiencing adverse effects. [25] Moreover, the intake of caffeine was reported to be 97% in India [26] and 98.5% in United Arab Emirates. [27]

Additionally, the prevalence of the use of dietary supplements has globally increased and dietary supplements are extensively consumed worldwide despite unproven efficacy. In the present study, the consumption of dietary supplement among the college student; which are intended to provide the diet with additional nutrients, were also high. Approximately less than half of the participants were using dietary supplement during their lifetime which is consistent with the studies conducted in different countries including Japan, the United States and European countries [14,28,29,30,31] The main issues of using dietary supplements as a LSMs are associated with lack of enough knowledge on its properties, active ingredients, beneficial effects as well as its adverse effects such as nephrotoxicity, hepatotoxicity, immunotoxicity. [32,33]

The present study reported that some students had experienced adverse events with the use of these LSMs which is impart might related to the use of dietary supplements such as constipation and/or stomach upset, dizziness or agitation, loss of appetite, weight gain, facial hair growth and/or hormonal disturbance, headache and/or mood changes.

Cosmetics and dermatological products consumption were also demonstrated in the responses of the participants. It has been found that one-third of the students were using cosmetics including skin depigmenting agents and products for female hirsutism which were quite close to the data recorded by other researchers in different countries such as Nigeria where the prevalence of use of skin lightening products among female of undergraduate medical students was quite high. [34] Moreover, skin toning practices have been reported among young women in Ghana and considerable number of university students in Saudi Arabia who use topical steroids on the face without knowing its nature. [35,36] Stressful environment and workload on the medical university students also led to administration of B-blockers such as propranolol or atenolol especially during examination. This practice is addressed in many other studies shown among medical and dental students at King Saud University in Riyadh where inappropriate use of beta-blockers has been used for relieving their anxiety and stress during examinations, and most of them were self-prescribed. [37]

In another section of the study the motives and the factors influencing the use of LSMs among the students have been investigated. The treatment of non-serious minor condition then social media or TV advertisement and peer pressure or friend influence were considering as the main motives for usage of LSMs among university students while reasons and motives for using these medications in another study was mostly peer pressure and to alleviate stress and anxiety [4] . Advertisement of pharmaceutical companies and their impact in medicalizing healthy life [7] have a crucial role in influencing the students to use these medications.

In the present study, the prevention of LSMs usage among university students has been suggested only by one-third of the students. They provided useful strategies for awareness of LSMs usage among students to decrease this phenomenon. Their suggestions were parallel with the previous reports which stated that providing appropriate education on dietary supplement among university students particularly pharmacy and medical students is crucial for their health and for their future profession as a pharmacist and physician. [38]

The present study has certain limitations, despite the good response rate that was received, the sample size was relatively smaller for cross sectional studies on awareness, attitudes, and use. As this is a cross-sectional study design, thus factors affecting student's responses cannot be studied over time. Another limitation was the number of universities, i.e., UOS, HMU and UOD which cannot be generalized to other universities of Iraq. Therefore, more studies are required from different universities which might have different opinions.

In conclusion, prevalence of using life style medications among university students is high and tendency for medicalization of healthy individuals in the aim of better academic performance and improve quality of life is increasing. Advertisement of pharmaceutical companies on a particular product has an important role in influencing the university students to use these medications for non-serious medical states. The prevention of LSMs intake by providing many strategies to prevent this phenomenon was raised by approximately half of the participants.

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