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The Prevalence of Dietary Supplements Use at University of Benghazi Medical Campus

Narges M. Kablan[1], Enas A. Mansor[2] , Isam Denna[3], Amera Alabeade, Fatima Alsahly, Hajer Almagbry, Hend Elfergani.

[1]*Department of Pharmacology &Toxicology, Faculty of Pharmacy, University of Benghazi , Libya.*
[2]*Department of Pharmaceutics, Faculty of Pharmacy, University of Benghazi , Libya.*
[3]*Department of Community Medicine, Faculty of Medicine, University of Benghazi, Libya.*

Abstract
Background: The consumption of dietary supplements (DS) has noticeably increased among men and women in Benghazi- Libya. DS are widely available in the market with poor regulations and guidance. However, Data on DS consumption in Libya is insufficient.
Objectives: To explore the prevalence of DS use at University of Benghazi medical campus, types of DS used, and reasons for using DS.
Material and Methods: This is a cross sectional study in which data were collected from 253 participants from the School of Pharmacy, School of Medicine and School of Public health at University of Benghazi. The study was conducted for one month using an electronic questionnaire.
Results: Most of the participants (81%) were females. Around half of the participants (51%) used DS. The main reason for using DS by participants was to improve general health (49%). Multivitamins and green tea were the most commonly used DS among participants (49 % and 45%, respectively). Health care providers and the internet were the main sources of information for consumers (38% and 24%, respectively).
Conclusion: There is a noticeable consumption of DS. Regular awareness should be provided by health care providers and the ministry of health. In addition, more studies should be conducted regarding the prevalence of DS use and the patterns of DS consumption among men and women in Libya.
Keywords: Dietary supplements, multivitamins and minerals, performance, supplements

I. INTRODUCTION

Dietary supplements (DS) can be defined as any product intended to supplement the diet with one or more dietary ingredients [1]. DS include vitamins, minerals, herbs, meal supplements, and products that enhance nutrient levels [2, 3]. DS consumption among adults and adolescent is increasing worldwide alongside the continuous growth of DS market [4]. The effect of the internet, social media and the recommendations of health care providers play an important role in the increased consumption of dietary supplements [5].

DS are used for many reasons. The most common reason of using dietary supplement is to maintain and improve health. DS are also used to increase energy, improve physical performance, and correct various lifestyle deficiencies [6,7]. In addition, some of the DS could be used to improve the body's ability to lose weight or gain weight and muscle [8,9].

However, limited studies are available regarding the proper use, dose, the long term health effect of DS and the recent trends in supplement use [10]. Some studies suggested that the increase intake and the high doses of some dietary constituents could be associated with some adverse effects and health consequences including cancer and cardiovascular disease [11,12,13] Furthermore, DS are not strictly regulated, they are markedly and vastly available in the market, in addition, it is difficult to ascertain the safety and purity of all supplements [14] which may lead to skepticism regarding their use [15].

In Libya, DSs are widely available in the market with poor regulations, and guidance. However, Data on DS consumption in Libya is insufficient. Our study is the first to investigate the use of DS at University of Benghazi medical campus, accordingly, the aim of this study is to explore the prevalence of DS use at Univeristy of Benghazi medical campus, types of DS used, and reasons for using DS.

II. MATERIAL AND METHODS

Design

This was a cross sectional study targeted students, faculty members, and employees at the School of Pharmacy, School of Medicine and School of Public health at University of Benghazi. The study was conducted from 1-31 March 2020 during COVID -19 pandemic using an electronic questionnaire. Permission to conduct the study was obtained from the School of Pharmacy and the permission was sent to the School of Medicine and the School of Public health at the university. A questionnaire link was sent by the School Pharmacy to faculties' members, employees and students involved in this study after obtaining participants' informed consent. The objectives of the study were explained for participants and they were assured anonymity.

Subjects

A total of 400 response were obtained, 147 of which were excluded because they provided incomplete questionnaires. 253 participants provided a complete questionnaire and their data were analyzed.

Data collection

Data was collected from electronic questionnaires. The questionnaire included 14 questions divided into two sections. The first section consisted of 6 questions related to demographic characteristics of participants (age, gender, occupation, college, academic year, education level). The second section consisted of 8 question related to the life style of participants and patterns of DS consumptions (health status, exercising routine, smoking status, reasons for using DS supplements, is the DS was taken via prescription or not, source of information about DS and types of DS used).

Data Analysis

Response to each question was coded and subsequently was analyzed using Statistical Product and Service Solution (SPSS**)** version 25.00 software package. Percentages and frequencies were calculated for variables as appropriate.

III. RESULTS

Demographic data of participants

Most participants (81.50%) were females and only 18.5 % were males as shown in **Table1** . The majority of participants (96.2%) were students, 2.4% were employees and only 0.7% were technicians and 0.7% were faculty member. Most of participants aged less than 25 (84%), while16% aged more than 25. Most of the students participated in this study were Pharmacy students (63.3%), while the rest of students were from the school of Public Health and School of Medicine (21.3% and 15.4%, respectively). 39.7% of the students were at the fourth year of college, while 27% at the second year, 18,4% at first year and the rest (14%) at the second year. Regarding the educational level of participants, 84.3% were students, whereas 15.4% had a bachelor degree, 3.2% diploma, 0.7% had a master degree and only 0.5% had a doctoral degree. **Table1**

Health status and life style of the study population.

As shown in **Table 2** around half of participants (49%) reported their health as good, while 48.30% reported excellent to very good and only 2.7 % reported their health as poor**.**

Most of participants (90.9%) were non-smokers, while 5 % smoke every day, 10% smoke occasionally, and only 1% reported themselves as a previous smoker**.** Regarding participants' exercising routine, the majority of participants (75%) poorly exercise, while 20% had a moderate exercise routine , and only 5 % exercise regularly (2-3 times per week). **Table 2**

Usage of dietary supplements and source of information

The results in **Table 3** showed that around half of participants in this study (51%) used DS, while nearly the other half (49 %**)** did not use any type of DS. The highest percentage of participants (60 %) used DS without medical prescription, whereas (40%) used DS via medical prescription. Regarding to the source of information about DS, the majority of participants received information from internet and social media (45%), and healthcare providers (38%), while 10% got the information form friends, and only 4 % and 3% got their information form sport clubs and the television. **Table 3**

Motives for using dietary supplement

The main motives for using DS were for general health improvement (60%), for skin care (23.7%), to strengthen hair and nails (31.6%), to prevent health problems (17.4%) and to obtain energy (16.6%). **Table4**

Non vitamins non minerals (NVNM) supplements usage among study population

The most used type of NVNM supplement by participants were green tea (46%), followed by Omega 3 (23%), 12% used ginger or Cod liver oil and 9% used garlic. **Table5**

Vitamins and mineral supplements usage the study population

Table 6 showed the most used types of vitamins and / or minerals in this study. Around half of the participants (49%) used multivitamins, while 35% used vitamin D and 33.2% used iron supplements, followed by vitamin C, folic acid and vitamin B12 (19%, 16%,16%, respectively). Other vitamins and minerals were also used as shown in **Table 6.**

IV. DISCUSSION

It is a well-known fact that DS are available in many different formulations and used to reduce disease risk, improve overall health, and increase immunity. There has been a growing awareness among people regarding the benefits of DS, therefore the usage of DS has increased dramatically [16]. In our study, the majority of the participants were students 96.2%s, and in the age group 18-25 (84%), nearly half of participants (51%) used dietary supplement which is similar to studies included students in India (49.6 %) Nigeria (50%), Saudi Arabia (46.8%), Pakistan (48.4%) and USA (66%) [16-20]. However, the prevalence of DS use among participants in our study was higher compared to a similar study in Croatia (30.5 %) and Japan [21,22]

Available Data on students' DS consumption in the Middle East is limited. However, studies in Kuwait and Saudi Arabia showed that there has been an increase intake of DS among college students [5,23]. The study in Japan reported that the prevalence of dietary supplement use did not differ significantly between males (17.1%) and females (16.7%) [22]. However, many studies have shown that females tend to consume DS more than males. In Jordan, Iran, Egypt and USA, studies showed that there is a high consumption of DS especially among women [24-27]. This is in accordance with result in our study in which the majority of DS users were females.

Regarding the reasons for using DS, DS could be used for improving overall health, maintaining health and to prevent diseases. In addition, DS is used for site-specific health reasons like heart, eye, joint and bone, enhance energy or to boost immune function [7,8]. Our study showed that the main reason for using DS by the participants was to improve general health by 60% which is similar to several studies such as a study in India (40%) Nigeria (58%), Saudi Arabia (26.2%), USA (73 %) and Croatia (26.4%) [16,17,18,20,21]. The other reasons for using DS in this study were for skin care by 23.7%, to strengthen hair and nails by 31.6%, and to prevent health problems by17.4%. These results could be attributed to the large number of females participated in this study.

The most commonly used type of DS in our study was multivitamins by 53 %, which is similar to the results of studies in India (40%), Pakistan (51.1%) and USA (42%) [16,19,20]. Furthermore, this finding of our study was lower than those reported in study in Saudi Arabia in which multivitamins were used by 91% [24]. Other vitamins such vitamin D and iron supplements were also used in this study by 35% and 33.2 %, respectively. In contrast to our study ,it was found that individual vitamins and minerals were more popular than multi vitamin in the study involved students in Nigeria [17] in which vitamin C was the most common used supplements while in a study in Japan, Iron supplements were used by 70% [22].

Source of information plays an important role in the consumption of DS. In general, the internet and social media, healthcare providers, sport clubs, friends and advertisements on TV were the main sources of information. Our study has reported that the internet was the most common source of information (45%) followed by healthcare providers (38%), which was similar to the findings in the study in Croatia in which internet was the most popular source for gaining information (66.1%) followed by health care professional (33.2%) [21]. The study in Japan reported the internet as the first source of information (38.3%) followed by stores (33.6%) [22]. However, the study in Nigeria reported that the main source of information about DS was the school (63%) [17].

Our study showed that almost half of participant(45%) used green tea as a NVNM DS, this could be attributed to the traditional habits of the Libyan people who consume green tea in a regular daily bases. Up to our knowledge, there is no published data about the consumption of green tea in Libya to compare it with our results.

Limitation of study

Similar to other studies, the present study has some limitations that should be considered. The response to the study has been affected by the continuous electricity shut down due to the conflict situation of Libya, as well as the general unawareness of the Libyan people regarding the importance of participation to studies involving online survey. Personal interviews and paper- based surveys would be a better alternative solution for future similar studies.

V. CONCLUSION

DS market has grown in Libya alongside the increase demands on DS. Poor guidance and lack of regulations on such supplement generate skepticism on the consumption of such products. The most common reason for using DS in this study is to improve general health and the most widely used DS are multivitamins and green tea. Regular awareness should be provided by health care providers and the ministry of health. In addition more studies should be conducted regarding the prevalence and the patterns of DS consumption among men and women in Libya.

Conflicts of Interest

The author declares that there are no conflicts of interest.

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Tables:

Table 1 Demographic characteristics of the study population (n=253)

Criteria	Frequency %	n= number
Gender		
Female	81.5	206
Male	18.5	47
Age group		
18-25	84	212
More than 25	16	41
Occupation		
Student	96.2	243
Employee	2.4	6
Technician	0.7	2
Faculty member	0.7	2
College		
Pharmacy	63.3	160
Public health	15.4	39
Medicine	21,3	54
Academic year		
Fourth or fifth year	39.7	100
Third year	27	68
Second year	14.92	38
First year	18.4	47
Education level		
Student	80.2	203
Bachelor degree	15.4	39
Diploma	3.2	8
Master degree	0.7	2
Doctorate	0.5	1

Table 2 Health and smoking status and exercising routine of the study population

Criteria	Frequency %	n=number
Health status		
Excellent	49%	124
Good	48%	122
poor	3%	7
Smoking status		
never	90.9%	227
Daily	5%	13
Occasionally	4	10
Previously smoker	1	3
Exercising routine		
Weak	75	190
Moderate	20	50
Excellent (2-3 times)	5	13

Table 3 Usage of dietary supplements and source of information

Variable	Frequency %	n=number
Do you use any type of DS?		
Yes	51	130
No	49	123
Do you use DS with or without prescrition ?		
With a prescription	40	102
Without a prescrition	60	151
What is your source of information regarding DS?		
Health care provider	38	96
Friends	10	25
Television	4	10
Internet and social media	45	114
Sport clubs	3	8

Table4 Motives for using dietary supplements

*Participants were allowed to choose more than one answer as appropriate.

Motive for using DS	Frequency %	n=number
Improve general health	61.6	156
Bone health	11.8	30
Add nutrients	13.4	34
Prevent health problem	17.4	44
Decrease cholesterol	3.2	8
Improve immunity	10.3	26
Joint strenght	3.6	9
Obtain energy	16.6	42
Skin care	23.7	60
Intestine disease	4.3	11
Eye health	4.7	12
Mental health	10.7	27
Decrease weight	7.1	18
Muscle strenght	5.9	15
Hair and nails	31.6	80
Increase ability to sleep	4.7	12
Pregenancy	6.3	16
Other reason	10.7	27

Table5 Types of Non Vitamins Non Minerals (NVNM) supplements used among study population

*Participants were allowed to choose more than one answer as appropriate.

Type of NVNM	Frequency %	n= number
Green tea	46	116
Cherry	1	2
Enzyme Q10	1	2
Omega3	24	61
Flaxseed	3.6	9
Omega 6	4	10
Omega 9	1.6	4
Probiotic	0.4	1
Garlic	9	23
Ginseng	1.6	4
Ginkgo biloba	2.8	7
Amino acid	2.8	7
Ginger	12.3	31
Cod liver oil	12.3	31

Table 6 Vitamins and mineral supplements used among study population

*Participants were allowed to choose more than one answer as appropriate.

Types of vitamins/or minerals used	Frequency%	N=number
Multivitamins	49	124
Selenium	2	5
Vitamin B6	8.3	21
Magnesium	4.7	12
Iodine	1	2
Chrome	1	2
Phosphate	2	5
Copper	1.2	3
Boron	0.4	1
Molybdenum	1	2
Vanadium	0.4	1
Vitamin A	7.1	18
Vitamin K	4.3	11
Vitamin C	19	48
Vitamin D	35	89
Vitamin E	9.9	25
Joints supplements	1.6	4
Vitamin B12	16.2	41
Iron	33.2	84
Folic acid	16.2	41
Proteins	6.7	17
Fibers	2	5
Potassium	2	5
Vitamin A	4	10
Niacin	4	10

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