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**PUBLIC KNOWLEDGE, ATTITUDES AND PRACTICE TOWARDS VITAMIN SUPPLEMENTS IN BEKAA VALLEY, LEBANON**

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Received on: 15-11-2019

Accepted on: 30-12-2019

**Abstract**

**Aims:** The present study was performed to determine the knowledge, attitudes, and practices towards consumption of vitamin supplements among the Lebanese general population.

**Methods:** A descriptive cross-sectional study was conducted between June and September 2017 among 402 adult participants presenting to community pharmacies in Bekaa Valley, Lebanon. Participants were interviewed and information was collected in a pre-tested structured questionnaire. It was composed of questions about demographics, awareness of vitamin supplements, sources of information, attitudes, reasons and frequency of using vitamins. Data was analyzed using SPSS version 22.0.

**Results:** Of the 402 participants, 63.2% were females. Mean age of participants was  $33.12 \pm 12.8$  years, where 61.7% of them have completed their university-level education. Results revealed that 396 (98.5%) of the respondents were aware of vitamin supplements and 373 (92.8%) think that they are helpful. The most commonly known vitamin was vitamin C (59.7%). As for side effects and interactions with other supplements and medications, 250 (62.2%) were unaware of them. Pharmacists were shown to be the most common source

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of information regarding vitamin supplements (47.8%). Results also showed that 302 (75.1%) of the respondents were current or previous users of vitamin supplements. Of these, 145 (48%) consumed them based on physician's advice and 241 (79.8%) took the recommended dose. **Conclusion:** Vitamin supplements are commonly taken and the majority of the study participants were not informed of their possible harmful effects. In view of this, educational interventions need to be implemented for increasing awareness and disseminating knowledge about vitamin supplements and their correct usage.

**Keywords:** Bekaa Valley; Community pharmacies; Lebanon; Vitamin supplements

### **Introduction:**

Over the past few decades, the use of dietary supplements, particularly vitamin supplements has markedly increased<sup>1</sup>, and their manufacturing is noticed to be rising at a fast rate<sup>2</sup>. Dietary supplements are often used for a wide array of reasons. Many people consume them to compensate for deficiencies due to poor dietary patterns and medical conditions, while, others seek them in an attempt to enhance their health and performance<sup>3</sup>. As stated by the Food and Drug Administration (FDA), a dietary supplement is defined as “a product taken by mouth that contains a “dietary ingredient”. Dietary ingredients include vitamins, minerals, herbs or other botanicals, amino acids, and other substances for use by people to supplement the diet”<sup>3</sup>.

The use of vitamin supplements is probably fostered by the promotion of health education and awareness, in addition to their wide availability, aggressive marketing, and media reports on studies suggesting that they may help to prevent or treat common health problems<sup>1</sup>. Although it is well established that many symptoms, subclinical conditions, and diseases are controlled or prevented by the use of vitamin supplements, however, some randomized controlled trials showed that they are ineffective and that the potential risks far outweigh the benefits<sup>4-8</sup>. A randomized controlled trial conducted by Sesso et al. on 14,641 participants in USA showed that cardiovascular events, myocardial infarction and stroke in men were not reduced by the daily intake of multivitamin supplements<sup>9</sup>.

According to the 2018 Council for Responsible Nutrition (CRN) Consumer Survey on Dietary Supplements, statistics showed that among users of dietary supplements in US, 83% aged 18-34, 75% aged 35-54, and 70% of those over 55 years take multivitamins. (Available online at: <https://www.crnusa.org/CRNConsumerSurvey>).

Given the increasing prevalence of vitamin supplement usage, some population are at a higher risk of clinical complications as a consequence of adverse drug reactions or interactions and other safety concerns<sup>10</sup>.

To the best of our knowledge, there is paucity of data available in Lebanon on vitamin supplements use, hence, the present study was designed in an attempt to determine the knowledge, attitudes, and practices towards consumption of vitamin supplements among the Lebanese general population in Bekaa Valley, a rural area of Lebanon.

### **Materials and Methods:**

A descriptive cross-sectional study was performed between June and September 2017 among the general population in Bekaa Valley, Lebanon. Patients or customers presenting to community pharmacies aged 18 years or older were included in the study after explaining the study protocol and obtaining their informed consent. Confidentiality and anonymity of the collected information were ensured to all the participants. Afterwards, face-to-face interviews were performed by pharmacy interns in the professional study years of the Lebanese International University who were realizing their pharmacy practice experience in community pharmacies located at Bekaa Valley, Lebanon.

Data were collected by means of a structured questionnaire developed after extensive literature review of related studies and was then properly adjusted for the current setting<sup>11-14</sup>. The questionnaire was reviewed and pre-tested by a group of pharmacy faculty members and finalized according to their comments. The study was approved by the Institutional Review Board of the School of Pharmacy at the Lebanese International University. The questionnaire consisted of two main parts. The first section was composed of questions about demographic data such as participants' gender, age, marital status, educational level, occupation, smoking, alcohol intake, and other related data. The second section included questions about awareness of vitamin supplements, sources of information, attitudes, reasons and frequency of using vitamin supplements. All data were coded, entered, and analyzed using the Statistical Package for Social Sciences (SPSS) version 22.0.

### **Results:**

A total of 402 questionnaires were completed, collected, and analyzed. Most of the respondents were females (63.2%) and Lebanese (86.8%). The mean age of respondents was  $33.12 \pm 12.8$  years with the majority within

the age group 18-25 years (38.6%). Most of them were married (43.5%), nonalcoholics (90.3%), and nonsmokers (59%). Concerning their educational status, the majority (61.7%) have completed their university-level education while only 5.2% were illiterate. The complete demographic results are presented in Table 1.

**Table 1: Demographic Characteristics of Respondents (N=402).**

<b>Variable</b>	<b>Frequency</b>	<b>Percentage</b>
<b>Gender</b>		
Male	148	36.8
Female	254	63.2
<b>Age Group</b>		
18-25	155	38.6
26-40	139	34.6
40-55	87	21.6
>55	21	5.2
<b>Nationality</b>		
Lebanese	349	86.8
Non-Lebanese	53	13.2
<b>Marital Status</b>		
Single	166	41.3
Married	175	43.5
Divorced/Widowed/Separated	25	6.2
In a Relationship	36	9
<b>Educational Status</b>		
Illiterate	21	5.2
Primary School	49	12.2
Secondary School	84	20.9

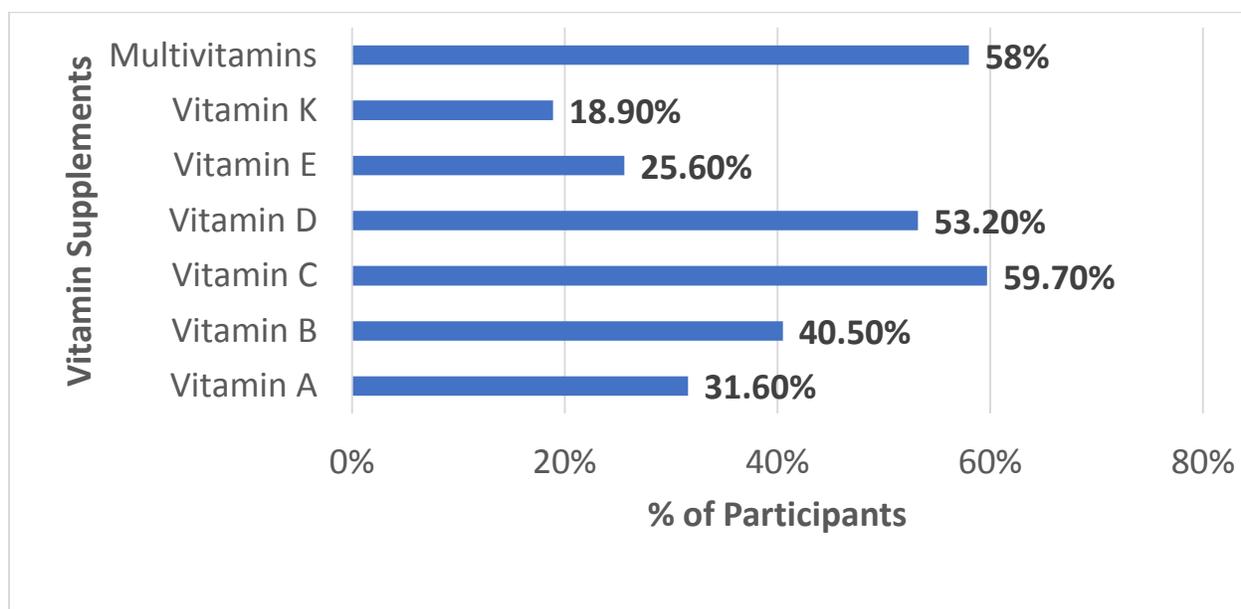
University and Above	248	61.7
<b>Occupation</b>		
Student	125	31.1
Healthcare	58	14.4
Non-Healthcare	118	29.4
Unemployed	87	21.6
Retired	14	3.5
<b>Alcoholic</b>		
Yes	39	9.7
No	363	90.3
<b>Smoker</b>		
Yes	165	41
No	237	59
<b>Family Income</b>		
< 500\$	63	15.7
500-1500 \$	185	46
> 1500\$	154	38.3
<b>Health Insurance</b>		
NSSF	107	26.6
COOP	43	10.7
Private	92	22.9
None	160	39.8

Almost all the participants (98.5%) were aware of vitamin supplements. The most commonly known vitamin was found to be vitamin C (59.7%). Figure 1 shows in details the supplements that the participants were aware of. The source of awareness of vitamin supplements was also assessed; where 192 (47.8%) reported the

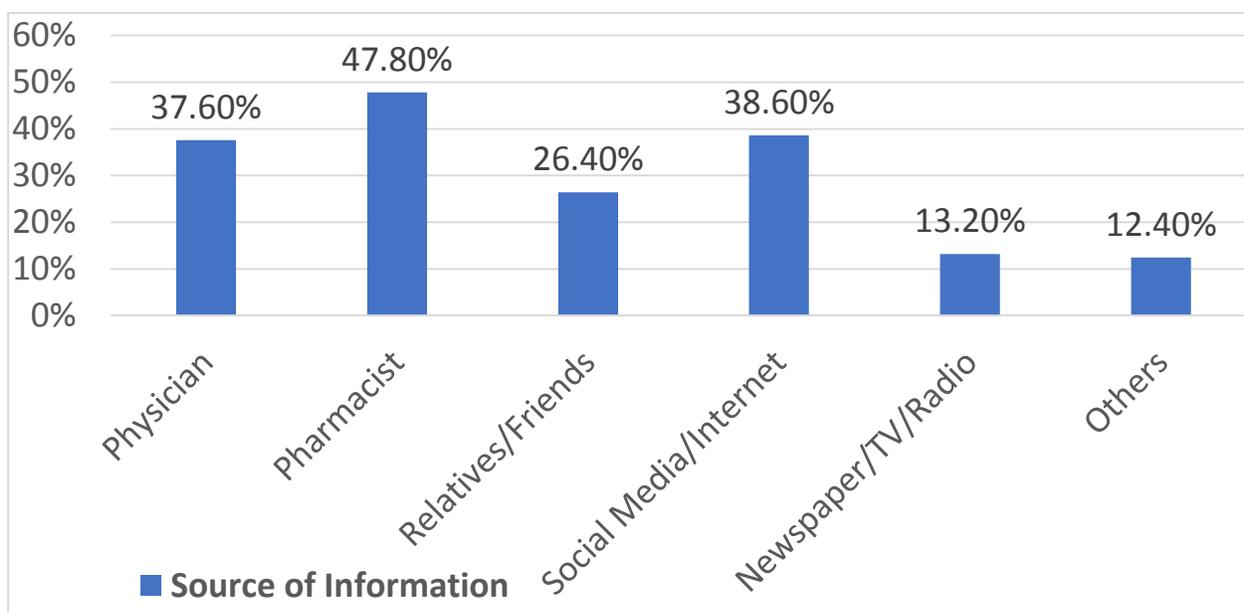
pharmacist to be their major source of information followed by social media and internet (38.6%) and then the physician (37.6%). Further details about participants' source of information regarding vitamin supplements are illustrated in Figure 2. Majority of the respondents (62.2%) were unacquainted with the side effects of vitamin supplements nor with their interaction with other supplements or medications.

Concerning their attitudes about vitamin supplements, 373 of the respondents (92.8%) think that they are helpful. Approximately 72% of them declared that taking vitamin supplements was to compensate for deficiencies, 68.9% to relieve fatigue/weakness, 67.9% to maintain and improve general health, 57.5% needed during pregnancy or lactation, 48.5% to improve appetite, 46% to improve skin condition, 45.3% to prevent hair loss, and 42.8% to recover from disease.

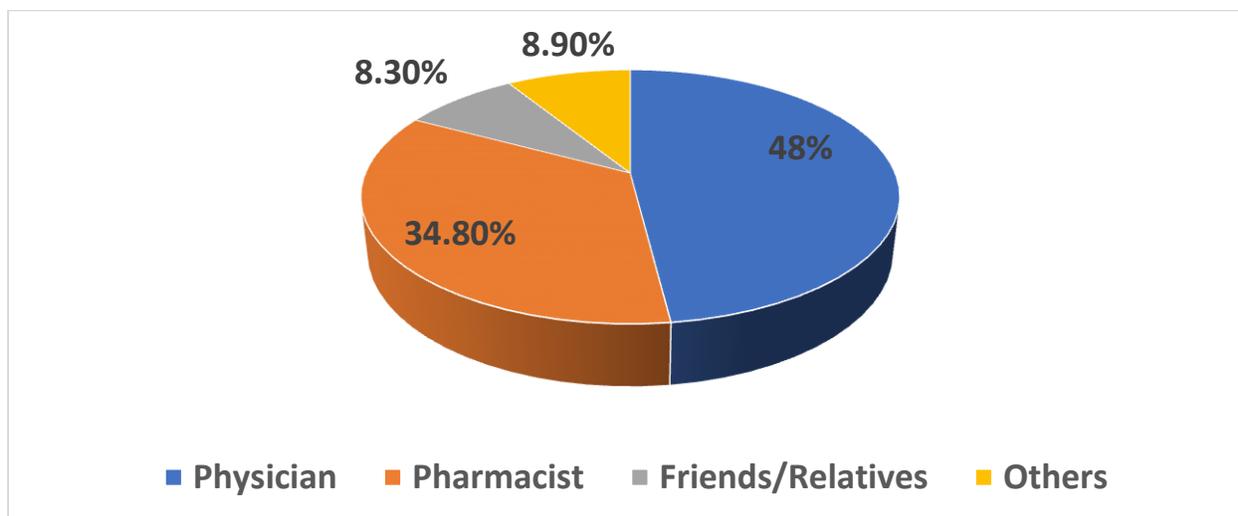
Majority of the respondents (75.1%) were current or previous users of vitamin supplements; of these, 241 (79.8%) took the recommended dose. There were variable responses for the frequency of use of vitamin supplements; 73.2% consumed them once daily, 15.5% twice daily, 4% three times per day, while 7.3% did not remember the frequency of their intake. Almost half of the participants (48%) consumed supplements based on the recommendations of their physicians, followed by pharmacists (34.8%) as shown in Figure 3. The most frequently used supplement was vitamin C (44.1%), followed by vitamin D (39.3%), then multivitamins (32.9%); whereas the least to be consumed was found to be vitamin K (1.4%).



**Fig. 1: Participants' Awareness about Vitamin Supplements.**



**Fig. 2: Participants’ Source of Information Regarding Vitamin Supplements.**



**Fig. 3: Participants’ Prescriber of Vitamin Supplements.**

**Discussion:**

To the best of our knowledge, the current study was the first to be undertaken in a community setting in Bekaa Valley, Lebanon, with the main objective being to assess the knowledge, attitudes, and practices towards consumption of vitamin supplements. Our findings showed that almost all of the respondents had awareness of vitamin supplements (98.5%) and the majority (75.1%) had consumed them, which supports the basis of this study concerning the prevalent consumption of vitamin supplements worldwide. These findings are quite comparable with the 2018 CRN Consumer Survey on Dietary Supplements data which showed that among

dietary supplement users, 83% aged 18-34, 75% aged 35-54, and 70% of those over 55 years take multivitamins. Similarly, results depicted by Alsofani et al.<sup>14</sup> and Sekhri et al.<sup>15</sup> reported that multivitamins were used by 77.1% and 68.33% of the participants, respectively. Also, a survey on the use of dietary supplements was performed in Columbia which showed that 73% of the participants used dietary supplements; out of which, 85% reported using multivitamin supplements<sup>16</sup>. Previous studies had also shown that females tend to consume supplements more than males as they are more concerned about their health<sup>17-18</sup>; hence, this may explain the high consumption rate of vitamin supplements in our study since the majority (63.2%) were females.

As for the sources of information about vitamin supplements, most of the participants (47.8%) reported the pharmacist to be their major source of information, whereas, in other studies conducted by Saini et al.<sup>12</sup> and Leah et al.<sup>19</sup>, the physician was found to be the most common source of knowledge. However, in accordance with these studies, our participants did also get their information from friends and relatives, internet, and newspaper.

Among the vitamin supplements' users, the number of those consuming them on a daily basis was high. This finding is in accordance with the findings of previous studies which showed that more than 50% of the consumers of dietary supplements take them on daily basis<sup>20</sup>. However, most of the respondents (62.2%) stated that they were not aware of vitamin supplements' side effects nor of their interaction with other supplements or medications reflecting their false beliefs about the safety of such medications. Due to the extensive availability of these supplements without any need for physician prescription and the faulty assumption of their safety, this can absolutely lead to excessive use of vitamins and thus pose patients to possible adverse events, toxicities, and interactions. Accordingly, patients should be educated on the harmful effects and potential interactions with other medications<sup>21</sup>.

In addition, there is limited safety and efficacy studies on dietary supplements and many results are conflicting<sup>21</sup>. Various studies ascertained that long-term use of vitamin supplements may not be safe and could lead to harmful consequences on health. A study conducted by Gordon et al. in California revealed higher incidence of gastric upset associated with the intake of vitamin C in high doses<sup>22</sup>. Moreover, the selenium and

vitamin E cancer prevention trial reported increased risk of prostate cancer among healthy men consuming vitamin E supplements<sup>23, 24</sup>. In addition, the Alpha-Tocopherol, Beta-Carotene Cancer Prevention Study showed higher rates of mortality due to hemorrhagic stroke among the participants receiving alpha-tocopherol for long periods<sup>25</sup>. Therefore, it is better not to use vitamin supplements for prolonged periods without medical supervision. Furthermore, there is no conclusive evidence of the beneficial effects of vitamin supplements in individuals with adequate dietary intake<sup>26</sup>. The present study has certain limitations which should be discussed. First, the study was designed to be a descriptive cross-sectional study, so it would be difficult to derive causal relationship. Second, it was conducted for patients or customers presenting at community pharmacies located at Bekaa Valley; which is one of the nine governorates of Lebanon, therefore, our results may not necessarily reflect that of the general population and a large-scale nationwide study is needed to assess other populations' perspectives. Furthermore, the majority of the respondents were well-educated, so this may have biased our findings by not adequately assessing the awareness and practices of the less educated population.

**Conclusion:**

It is noticeable that the findings of our study are in accordance with many other studies conducted on the same topic concerning the prevalent use of vitamin supplements. Notably, the majority of the study participants were not aware of any potential harmful effect associated with vitamin supplement use nor of their interaction with other supplements or medications. Therefore, expanding education of the population through conducting awareness campaigns and fostering their relationship with health care professionals is crucial to ensure adequate usage of vitamin supplements.

**Acknowledgements:** The authors are grateful to the subjects who participated in the study.

**Conflict of Interest:** The authors declare that there is no conflict of interest.

**Funding:** None

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