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Dietary Supplement Intake: A Study on its Associated Factors among University Students in Terengganu

Nurul Fathin Mohd Yazid¹, Fatimah Syahirah Azli¹, Fatimah Abd Ghani¹, Noorazlin Ramli¹, Norhayati Mohd Yusof²

¹Faculty of Hotel & Tourism Management, Universiti Teknologi MARA, Dungun, Terengganu, Malaysia, ²Faculty of Hotel & Tourism Management, Universiti Teknologi MARA, Puncak Alam, Selangor, Malaysia

Abstract

The aim of this paper is to determine the associated factors that influence students' decision to have a dietary supplement in their daily intake. The participants for this study are bachelor degree students in three Terengganu local universities. Data were obtained through online questionnaires. Among 406 respondents, 126 (30.9%) are currently using dietary supplements. The prevalence of dietary supplement used does not differ significantly between males and females. However, most respondents claimed decreases in their Body Mass Index - and it is higher in non-associated science students as compared to science-associated students. The most used sources of information are the internet, and the most popular places to obtain their supplement are pharmacy and drugstore. Furthermore, the main reason for dietary supplement consumption is to maintain their health level, and most of them consumed only one supplement. Results of this study extend and provide additional information to the existing research by extending the area of research and beneficial to the supplement industry, especially in Terengganu. However, future research in this area is recommended to expand in other area and population in Malaysia. Therefore, supplement consumption among university students is still controllable.

Keywords: Supplement Prevalence, Supplement Intake, Dietary Supplement, Adverse Effect.

Introduction

People have been widely exposed to the importance of supplement through the media presence. Many people, especially young adults with hectic schedules, will substitute the missing nutrient in their diet with the dietary supplement. Based on the current research, supplement intake may occasionally be uncontrolled without any supervisory and may affect the consumers' health. Besides, there are ample shreds of evidence on the fact that dietary supplements have been used without any consultation from the medical professionals and people are unaware of the side effects. With that, the utmost factor that triggers this study to be conducted is that the researcher intends to

investigate the relationship between dietary supplement intake among students and its associated factors. Besides, the consumption of supplement has become uncontrollable, and people consume it without any further justification or serious reasons (Barnes et al., 2016). The consumption of the dietary supplement is also increasing in developing countries, whereby 75% of individuals consume more than one type of supplement at one time (Bessada et al., 2018).

This research aims to determine the associated factors that influence students' decision to have the dietary supplement in their daily intake and investigate the relationships between three associated factors that are external factors, internal factors, and the supplement intake adverse effect on students' prevalence of dietary supplement consumption. External factors include the source of information and a place to obtain a dietary supplement. Purpose of supplement consumption, type of supplement consumed, and student's level of awareness on the dietary supplement is categorised under internal factors that will affect the prevalence of dietary supplement consumption. As for the adverse effect, it focuses on the experience of the adverse effect itself and their response towards it. Each of the factor chosen is based on the findings from several studies made by several researchers who agreed that it would affect the prevalence of dietary supplement (Alfawaz et al., 2017; Chiba et al., 2017; Kobayashi et al., 2017; Fattahzadeh-ardalani et al., 2016; Al-Naggar & Chen, 2011).

Literature Review

Dietary Supplement and Its User

Akabas et al. (2016) defined dietary supplement as products that are consumed to complete or enhance the diet without containing any tobacco. It is also consumed to help prevent diseases, maintain health, or provide extra energy to the body (Barnes et al., 2016; Fattahzadeh-ardalani et al., 2016). The number of people that consumed dietary supplement is more than half of the population in the United States, and this has been approved by several researchers (Blumberg et al., 2017; Akabas et al., 2016; Knapik et al., 2016; Barnes et al., 2016). In addition, the number of people consuming supplement in the United States keeps increasing with its percentage becoming closer to 100% (Blumberg et al., 2017). In Malaysia, Zaki et al. (2018) concluded that the prevalence of Vitamins/Mineral Supplements (VMS) and Food Supplements (FS) intakes among adults were 28.1% and 34.0% respectively. Older aged adult women with higher education level and monthly income are more probable to consume dietary supplements. Vitamin C and multivitamin/ multi-mineral are the commonest VMS consumed by the respondents. The most common FS taken are fish oil and royal jelly. The main reasons for dietary supplements intake include for health reasons, doctor's prescription, to increase energy level, and for beauty. About one-third of the Malaysian adults consumed a variety of dietary supplements. Thus, information based on the scientific shreds of evidence of health benefits for each type of dietary supplements is needed to facilitate consumers to make informed choices on the dietary supplements.

External Factors: Source of Dietary Supplement and Place to Obtain Dietary Supplement

Most of the consumers obtain the information of supplements through the internet (Žeželj et al., 2018), which is also supported by other researchers stating that internet has the biggest influence on consumers (Jawadi et al., 2017; Barrack & Gray, 2017). Family is also one of the biggest information sources with a percentage of 41.3 percent (41.3%) on supplement intake (Axon, Vanova, Edel, & Slack,

2017; Circella, 2017). Besides, friends holding a percentage of 20.5 percent (20.5%) or any close acquaintances based on a study done in Malaysia (Yeong & Choong, 2017). As for the place to obtain dietary supplement, drugstore is the most chosen place to buy a supplement in Japan by a significant percentage of 63.7 percent (63.7%) (Chiba et al., 2017). Some of the consumers also obtain it through internet (19.6%) (Kobayashi et al., 2017).

Internal Factors: Purpose of Dietary Supplement, Type of Supplement Used, and Level of Awareness

Most of the consumers used dietary supplement as one of the methods to reduce their weight (Fattahzadeh-ardalani et al., 2016). Another recent study made in Saudi Arabia proved that people consume the supplement to improve their appearances (Naqvi, Ahmad, Abdul, Elewi, & Alawa, 2018). According to Knapik (2016), multivitamin or multi-mineral supplement is the type of supplement that contains two or more vitamins or minerals without any presence of other substances. Protein supplement is a supplement that intends to provide extra protein to its user, while the herbal supplement is classified as a supplement with one or more herbal ingredients in its content (Knapik et al., 2016). The percentage of people that are actually aware of the importance of consuming a supplement with professional prescription is at 70 percent (70%), and the rest are unsure on the difference of with or without prescription (Alfawaz et al., 2017). The high level of awareness on the importance of dietary supplement increases the prevalence of dietary supplement intake (Kobayashi et al., 2017).

Adverse Effect: Experience and Response

Some supplement users may or may not experience the adverse effect of supplement intake. The usage of dietary supplement may result in several effects when the consumption achieves to some extent, and the effect may be hypertension, antibiotic-associated diarrhea, ill, and more (Marx et al., 2016). In Japan, most of the consumers tend to do nothing when they are experiencing an adverse effect of supplement intake (Kobayashi et al., 2017).

Prevalence of Dietary Supplement Intake

Prevalence of dietary supplement study has been done in several countries and settings (Kobayashi et al., 2017; Alfawaz et al., 2017; O'Brien et al., 2017). Most of the studies relate the strength of each determinant towards the probability of student in consuming supplements. Kobayashi et al. (2017) conducted a study on the prevalence of dietary supplement used among college students, while Alfawaz et al. (2017) made a study on the prevalence of dietary supplement used and the associated factors among female college students in Saudi Arabia. Both studies have recommended that more researchers should conduct studies on dietary supplement intake to help increase awareness and basic knowledge related to supplements. Therefore, this study is made to fill in the gap as there is no study yet found on the prevalence of dietary supplement intake and its associated factors.

Methodology

This study unit of analysis are bachelor's degree students from Universiti Teknologi MARA (UiTM), Universiti Terengganu Malaysia (UMT), and Universiti Sultan Zainal Abidin (UniSZA) in

Terengganu. The number of respondents required is determined by Krejcie and Morgan (1970) sampling table. Based on the table by Krejcie and Morgan, 379 students ($n = 379$) are considered sufficient to represent the whole population for this study. The questionnaire for this study is prepared and distributed by an online questionnaire, and data are collected by the researcher through Google Form. Pilot test as a way in pre-testing the questionnaire is conducted before the online questionnaire is distributed out to respondents. Each of the factor of dietary supplement consumption has been analysed by using SPSS software version 24.0 to test its reliability. Cross tabulation table is used in order to summarise the obtaining value. Multiple answers. Statistical analyses were conducted between males and females. p -values were calculated using χ^2 test.

Result and Analysis

The information on the sources of information about dietary supplement used by the respondents is shown in Table 1 below.

Table 1: Source of Information on Dietary Supplements (%)

	All	Male	Female	p -Value
Television	15.3	17.4	14.9	0.605
Radio	4.5	2.9	4.8	0.491
Newspaper, magazines, flyers	13.9	11.6	14.3	0.549
Internet	37.9	36.2	38.2	0.758
Medical assistance	17.4	11.6	18.6	0.164
Family	9.9	2.9	33.2	0.032
Friends or acquaintances	9.7	10.1	9.6	0.885

The most commonly used sources of information among respondents are the internet (37.9%). This is followed by medical assistance (17.4%), the television (15.3%), newspapers, magazines and flyers (13.9%), family members (9.9%), friends or acquaintances (9.7%), and lastly from the radio (4.5%). Females majorly find information regarding dietary supplement from their family as compared to males with a p -value of 0.032.

External Factor: Place to Obtain Supplement

The information on the place to obtain dietary supplement by the respondents is shown in Table 2 below.

Table 2: Place to Obtain supplement (%)

	All	Male	Female	p-Value
Pharmacy, drugstore	40.2	36.2	41.0	0.460
Retail store, supermarket	10.5	1.4	12.3	0.007
Online shop	12.5	14.5	12.0	0.576
Family	10.1	10.1	10.1	0.999
Friends or acquaintances	5.9	8.7	5.4	0.288

Analysis of data shows that the most popular place chosen by the respondents in obtaining their supplement is pharmacy and drugstore (40.2%). This is followed by online shops (12.5%), retail store and supermarket (10.5%), family (10.1%), and then friends or acquaintances (5.9%). There are some gender differences found in respondents who obtaining supplement from retail store or supermarket. It is found that women (12.3%) tend to buy their supplement in retail store as compared to men (1.4%) with a p-value of 0.007.

Internal Factor: Purpose of Dietary Supplement Consumption

The purpose of dietary supplement consumption by the respondents are reported in Table 3 below.

Table 3: Purpose of dietary supplement consumption (%)

	All	Male	Female	p-Value
Maintenance of health	44.1	34.8	46.0	0.088
Beauty benefits	21.8	10.1	24.3	0.010
Weight loss	12.1	15.9	11.3	0.287
Weight gain	5.2	5.8	5.1	0.806
Building muscle	2.0	4.3	1.5	0.121
Treatment of disease	10.4	4.3	11.6	0.071

Results show that the main objective of dietary supplement consumption is for maintaining their health level (44.1%). The other reasons are for beauty benefits (21.8%), weight losing (12.1%), disease treatment (10.4%), weight gaining (5.2%), and muscle building (2%). There has been a major difference between genders in the purpose of consuming dietary supplement for beauty benefits as female (24.3%) are prone to it as compared to male (10.1%) with p-value 0.010.

Internal Factor: Type of Supplement Used

The type of dietary supplement used by the respondents are reported in Table 4 below.

Table 4: Type of Supplement Used (%)

	All	Male	Female	p-Value
Mineral supplements	10.9	13.0	10.5	0.534
Vitamin supplements	37.2	31.9	38.3	0.314
Herbal supplements	3.7	10.1	2.4	0.002
Protein supplements	1.7	0	2.1	0.226
Fish oil supplements	3.0	0	3.6	0.110
Sunnah supplements	2.2	0	2.7	0.169

The most popular type of dietary supplement consumed by respondents is vitamin supplements (37.2%). Other types of supplement consumed by respondents are mineral supplements (10.9%), herbal supplements (3.7%), fish oil supplements (3%), Sunnah supplements (2.2%), and protein supplements (1.7%). There have been significant genders differences for herbal supplements consumers as male (10.1%) tend to consume it more as compared to female (2.4%) with p-value 0.002.

Internal Factor: Level of Awareness

It is found that majority of the respondents are aware of the benefits of their supplement standing at 51.2 percent (51.2%). Together with the increase of the awareness of dietary supplement consumption, respondents are much aware of the importance, side effect, and objective of their consumption of dietary supplement. There are differences found in the awareness of respondents in reading the instruction attached with the supplement as female (51.3%) tend to read it more as compared to male (43.5%) with p-value 0.021.

Adverse Effect: Experience to Adverse Effect

The respondents are reported Experience of Adverse Effect from dietary supplement consumption are reported in Table 4 below.

Table 5: Experience of Adverse Effect.

	All (%)	Male (%)	Female (%)	p-Value
Yes	19.8	26.1	18.5	0.119
No	80.2	73.9	81.5	

There is higher percentage of respondents that have not experienced any adverse effects as compared to those who have experienced adverse effects; thus, there is no significance difference between student genders.

Adverse Effect: Response

Table 6: Response to adverse effect (%)

	All	Male	Female	p-Value
Did nothing	4.2	10.1	14.1	0.007
Stopped using dietary supplement immediately	12.4	8.7	13.1	0.308
Consult with family	2.7	4.3	2.4	0.362
Complained to seller	0.2	0	0.3	0.650
Went to the clinic or hospital	2.0	4.3	1.5	0.121

Most of the users that experienced adverse effect due to supplement consumption stopped consuming supplement (12.4%), some did nothing (4.2%), consulted with family (2.7%), went to clinic (2.0%), and complained to the seller (0.2%). There is a big difference between genders for the symptom of nausea and vomiting with the female at 16.6 percent (16.6%) who are majorly having these symptoms as compared to male at 10.1 percent (10.1%) with p-value 0.029.

Conclusion

A survey on the prevalence of dietary supplement intake among Bachelor Degree students from public universities in Terengganu has been conducted, and the results found that 30.9 percent (31%) of the students are currently consuming dietary supplements. Furthermore, 26.7 percent (26.7%) of the students previously used supplement, which adds up to percent in total 57.6 percent (57.7%) known and consumed dietary supplement. In comparison to the percent of student that never used dietary supplement (42.3%), they are still aware of the importance of dietary supplements. The consumption of the dietary supplement is due to several factors that related, which are classified into external factors, internal factors, and adverse effects. The most chosen sources to gain information regarding dietary supplement is through the internet (37.9%) and bought it from the drugstore (40.2%). The main reason for supplement consumption is to maintain health (44.1%), and most of them are consuming vitamin supplement (37.2%). Moreover, the level of awareness among students regarding dietary supplement is high (51.2%). In line to that, the number of supplement consumer among students that experienced adverse effects is low (19.8%)

Corresponding Author

Fatimah Abd Ghani. Faculty of Hotel & Tourism Management, Universiti Teknologi MARA, Dungun, Terengganu.

Email: fatim131@uitm.edu.my

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