



## Knowledge and Determinants of Use of Health Supplements among Undergraduates in Ipoh, Perak Malaysia

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### Abstract

**Background Objectives:** Research on health supplement usage among Malaysian undergraduate students is still limited although an average of USD17.30 was reported spent for nutritional supplements monthly. This study aimed to determine the usage of health supplements among the undergraduate students in Ipoh, Perak, Malaysia and the relationship between consumption and knowledge of health supplement among these students. **Methods:** This cross-sectional study was conducted in March to April 2018. Health sciences students and non-health sciences students from four different universities/colleges were selected through cluster sampling and random sampling method. A questionnaire that included socio-demographic data, lifestyle practices, usage of health supplement and assessment of knowledge of health supplements was given to selected students. Data analysis was done using SPSS 22.0 (Trial Version). **Results:** There were 374 respondents of which 79 students (21%) consumed health supplements. The majority of those who consumed health supplements (82%) were from Health Sciences, female (61%), overweight (44%) and with family income of more than RM5000 (39%). The top three most common reasons for using health supplements were “to maintain good health” (82.3%), “to ensure adequate nutrition” (54.4%) and “to improve immune function” (40.5%). The most common types of health supplements used were vitamins (44%) and minerals (23%). Fifty seven percent of the consumers had good knowledge compared to 30.5% of non - consumers. **Conclusion:** The majority of the consumers were from Health Sciences, female, overweight, had family income more than RM5000 and had better knowledge regarding the health supplements as compared to the non-consumers.

**Keywords:** Health supplements, Undergraduates, Knowledge, Use.

### Introduction

Dietary supplement as defined by the U.S Food and Drugs Administration (FDA) is a consumption product containing “dietary ingredient” to add further nutritional value to the individual’s diet.

This is available in diverse forms such as tablets, capsules, soft gels, gel caps, liquids or powder. The product’s ingredients may be one, or any combination of a vitamin, mineral, herb /botanical, amino acid or any dietary substance for an individual to use as a supplement to their diet [1]. This study was chosen because the research on health supplement use among undergraduate students is still limited in Malaysia especially with regards to the non-clinically proven health supplements. Based on

statistics acquired, an average of USD17.30 was spend by Malaysians for nutritional supplements per month [2]. Hence it’s important to assess students’ knowledge on health supplements, with regards to the risks and benefits on their health. This study was conducted in expectation that it will also indirectly increase the awareness of the participants regarding the supplements they are currently using.

The aims of this study were to determine the prevalence of health supplements usage among undergraduate students in Ipoh, to study the determinants of using health supplements and to assess the knowledge regarding health supplements. Specific objectives included identifying the prevalence

of usage of non-clinically proven health supplements, comparing the prevalence among health science and non-health science students, common types of health supplements used, the reasons for usage, the most common source of health supplements, any association between sociodemographic data (age, ethnicity, gender, marital status, body mass index, family monthly income) with usage and the relationship between lifestyle practices (smoking, exercise, alcohol use, diet) with the usage of health supplements among the undergraduate students.

The authors would like also to determine the relationship between the use and knowledge of health supplement among undergraduate students in Ipoh, specifically with regards to the possible side effects of health supplement use, its recommended dietary allowances and whether it was clinically proven or not.

## Materials and Methods

This cross sectional study was carried out among undergraduate students in four different colleges and universities around Ipoh, Perak from March 2018 to April 2018. Ipoh is the capital city of Perak with a population estimated with almost 700 000 residents in 2016. The leading population by ethnic group in Ipoh is Chinese (44.1%) followed by Malay (38.6%), Indian (14.1%) and others including non-Malaysian (3.2%). There are currently 17 colleges and universities situated in Ipoh with a population of approximately 7000 undergraduate students according to the Majlis Bandaraya (City Council) Ipoh's website. Of the 17 colleges and universities listed, cluster sampling was done. The universities/colleges were divided into health science colleges and non-health science colleges. It was further selected by random sampling method using OpenEpi random number generator.

Two colleges selected under the health science group were Quest International University Perak and Royal College of Medicine Perak while another two colleges selected under the non health science group were Kolej Poly-Tech Mara and Kolej Teknologi Perak. Students in the respective universities/colleges were then selected by convenience method. Prior permission from the university ethics / research committee and the institutions selected were obtained.

The study was also registered online with NMRR. Out of the overall 7000 students, a minimum sample size was calculated assuming that 48% of the undergraduate students have consumed dietary supplements at least once in their life with a precision of 5% for a 95% confidence level is 364 undergraduate students. All undergraduate students who were studying in the universities / colleges at the time of the study were included.

Undergraduates below the age of 18 years old and those in Foundation or pre-university programmes were excluded. An information sheet on the study was distributed to the target population and prior written consent was obtained. Questionnaires in two languages (English and Malay) were distributed to the target population and the participants were required to answer the questionnaire on their own and hand it over to the researcher once it was done. Their identity and personal data was kept confidential.

The data obtained was tabulated and analysed using Microsoft Excel and Statistical Package for Social Sciences (SPSS) 22 for Windows (Trial Version). The frequency and the percentage of each demographic data and lifestyle practices were evaluated using descriptive statistics. The association between dependent and independent variables was tested using Pearson Chi Square test with the P-value of <0.05 considered to be statistically significant. Demographic data collected included name of university / college, course, year of study, gender, ethnicity, marital status and family monthly income. Lifestyle factors included body mass index (calculated from height/weight), smoking history, exercise frequency, alcohol use, diet, and knowledge of health supplements used. Knowledge was tested using ten questions (see Appendix 1) and the total knowledge score was divided into good knowledge (above 3<sup>rd</sup> interquartile), fair (between interquartile ranges) and poor (below 1<sup>st</sup> quartile range)

## Results

There were a total of 374 respondents, consisting 178 males and 196 females with the mean age of 21 years. Table I shows the demographic characteristics of the respondents and association with the usage of health supplements. The majority of the

respondents were female (52.4%), Malay (63.1%), aged 18 to 20 years (44.9%), single (99.5%) and with a family income between RM 1,000 to RM 3,000 (32.4%). Seventy nine (21.1%) students consumed health supplements.

Amongst those who consumed health supplements, 82% (65) of them were health sciences students while 18% (14) were non-health science students. The majority of the consumers were female (61%). The highest usage of health supplements were within the age group of 24-26 years (43.6%), among Indians (31.6%), females (24.5%) and individuals with more than RM5,000 monthly family income (35.2%). The association between age group and family income with the usage of health supplements were statistically significant ( $P$  value = 0.00), but it was not significant for gender, marital status and ethnicity. Table II shows the lifestyle practices of the respondents.

For body mass index, the highest numbers were overweight (42.8%). The majority only exercised whenever they had time (62.6%). Alcohol consumption among respondents was very low (7.5%) and only 13.4% currently or previously smoked with 68.2% of the students consuming 1-2 portions of fruits and vegetables per day. Only 1.9% of the respondents were vegetarian. Overweight students had the highest prevalence of consumption of health supplements. But it was not statistically significant. The association between fruits and vegetables intake and the usage of health supplements among the undergraduate students was the only one statistically significant value ( $P$ -value = 0.024) among all the lifestyle practices listed (see Table II).

Among the consumers, 62 (79%) consumed clinically proven health supplements (e.g. Shaklee, Blacks more, Bio-life etc.) while 8 (10%) consumed non-clinically proven health supplements (e.g. Whey protein, K-colly). Another 9 (11%) did not mention the brand or name of the products of health supplement they were currently consuming. Pearson Chi-square test of association between consumers (health sciences students and non-health sciences students) and prevalence of clinically proven or non-clinically proven health supplements consumed by them showed a value of 0.016 ( $<0.005$ ) which was

statistically significant. Forty four percent of the students took vitamins (e.g. multivitamins, Vitamin B Complex, Vitamin E), 23% took minerals type of health supplements (e.g. iron, calcium, magnesium), 22% herbs (e.g. Ginkgo Biloba, fish oil) with 11% amino acids (e.g. glutamine, lysine).

Multiple reasons were given by the 79 students for consuming health supplements which included maintaining good health (65 students -82.3%), ensure adequate nutrition (43-54.4%), improve immune function (32-40.5%), enhance daily performance (30-38%), gain more energy (27-34.2%), prevent diseases (23-29.1%), enhance physical appearance (13-16.5%), greater muscle strength (8-10.1%), lose weight (8-10.1%), and peer pressure/ encouraged by family (2-2.5%). Most of the students obtained their health supplements from the pharmacy / drugs store (57-72.2%) followed by online shop (15-12.7%).

The remaining students obtained their health supplements via doctor's prescription, agents, beauty centre, Chinese medicine hall and night market. Most students (187-50%) had fair knowledge on health supplement while 135 (36.1%) had good knowledge and 52 (13.9%) had poor knowledge. The mean total knowledge score of the respondents was 6.0615 ( $SD=2.66221$ ). Among the consumers 57%, 41.7% and 1.3% had good, fair and poor knowledge respectively as compared to 30.5%, 52.2% and 17.3% of the non consumers with good, fair and poor knowledge. Consumers have a higher mean of total knowledge score with 7.367 ( $SD=1.949 \pm 0.219$ ) compared to the mean total knowledge score of non-consumer with 5.712 ( $SD=2.721 \pm 0.158$ ). This was statistically significant.

Among the consumers of clinically approved health supplements, most of them had good knowledge (61.3%). Pearson Chi-Square test value between the approval status of the health supplements and total knowledge score groups is 0.048 which is statistically significant. Seventy two percent of students were aware of their health supplement used whether it was clinically proven or not, whereas 6% (5) of them were not aware whether their health supplements were clinically proven or not. Twenty two percent were not sure.

**Table 1: Respondents sociodemographic data & association with usage of health supplements.**

Variables		Number (%)	Using health supplements number (% within each subgroup)
Age Group in years	18 - 20	168 (44.9)	12 (7.1)
	21- 23	151 (40.4)	43 (28.5)
	24 - 26	55 (14.7)	24 ( <b>43.6</b> )
Ethnicity	Malay	236 (63.1)	41 (17.4)
	Chinese	34 (9.1)	6 (17.6)
	Indian	95 (25.4)	30 ( <b>31.6</b> )
	Others	9 (2.4)	2 (22.2)
Gender	Male	178 (47.6)	31 (17.4)
	Female	196 (52.4)	48 ( <b>24.5</b> )
Marital status	Single	372 (99.5)	79 ( <b>21.2</b> )
	Married	2 (0.5)	-
Family income	< RM 1,000	69 (18.4)	8 (11.4)
	RM 1,000 – RM 3,000	121 (32.4)	17 (14.0)
	RM3,000 – RM5,000	96 (25.7)	23 (24.0)
	> RM5,000	88 (23.5)	31 ( <b>35.2</b> )

**Table 2: Respondents' lifestyle practices and its relationship with usage of health supplements**

Variables	Number of students: N (%)	Usage of health supplement: Number (%)	P-value
<b>Total respondents N= 374</b>			
Body Mass Index			
Underweight < 18.5	92 (24.6)	17 (21.5)	0.773
Normal 18.5 – 22.9	122 (32.6)	27 (34.5)	
Overweight ≥ 23	160 (42.8)	35 (44.3)	
Smoking			
Never smoke	324 (86.6)	69 (21.3)	0.735
Currently smoking	35 (9.4)	6 (17.1)	
Ex smoker	15 (4.0)	4 (26.7)	
Exercise			
Whenever I have time	234 (62.6)	43 (18.4)	0.502
2 – 3 times a week	79 (21.1)	20 (34.2)	
4-5 times a week	29 (7.8)	8 (27.6)	
Daily	13 (3.5)	4 (30.3)	
Never	19 (5.1)	4 (21.1)	
Alcohol			
Yes	28 (7.5)	7 (25.0)	0.601
No	346 (92.5)	72 (20.8)	
Fruits and vegetables intake			
Do Not Take	50 (13.4)	6	<b>0.024</b>
1-2 Portions A Day	255 (68.2)	57	
3-4 Portions A Day	60 (16.0)	11	
>5 Portions A Day	9 (2.4)	5	
Vegetarians			
Yes	7 (1.9)	2 (28.6)	0.626
No	367 (98.1)	77 (21.0)	

## Discussion

The usage of health supplements among Ipoh undergraduate students in this study was 21.2% which was lower than the study conducted among young Malaysians in Management and Science University in 2014 with prevalence of 43% [3]. A higher prevalence was found in study in South India among health-sciences students as half of the study subjects were found to consume health supplements [4]. In this study the consumers were mainly females (61%) which is consistent with other previous studies finding [2, 5, 6]. The study also found that higher usage of health supplements with better knowledge was among the health science students as compared to non-health science students. Because of the nature of their course of study, health science students were more knowledgeable regarding health supplements. A previous study also showed

the same finding with a significant difference between health sciences and non-health sciences students in terms of knowledge [6]. Most of the consumers were overweight. However, unexpectedly, the most common reason for the usage was not "To lose weight due to body dissatisfaction" instead, the primary reason was "To maintain good health" which has similar findings in a previously done study, where the majority of the consumers had normal body mass index [2]. It was found that most of the consumers had more than RM5000 monthly family income which correlates with a study done in United States, which showed that adults in high income household spent more on health supplements [7]. The probable reason was because they could afford it especially for clinically proven health supplements which were more costly. Among the consumers of clinically approved health supplements, most of them had better knowledge than the

consumers of non-clinically approved health supplements. A possible reason could be the consumers who used clinically approved health supplements had done a thorough reading prior to consuming the health supplements. However, no previous similar study had looked into this. All the consumers were single, being mostly young adults and students, so the association between reasons for usage and marital status could not be done.

The most common source of health supplements based on the survey was from pharmacy / drug store whereas the least common sources were Chinese Medicine Hall and night market. As the study was done among the undergraduate students, they probably had higher awareness of purchasing the health supplements from trusted sellers and from the right place. However there was no previous study done in the same context. The health supplement most commonly used

was vitamins followed by minerals. This correlates with a previous study [2]. This might be due to the students' belief that multivitamins were needed to supplement their diet which might not be the healthiest. In conclusion, the majority of the undergraduates who consumed health supplements was from Health Sciences, female, overweight, had family income more than RM5000 and had better knowledge regarding the health supplements as compared to the non-consumers.

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### Appendix 1: Knowledge questions in questionnaire on health supplements usage among undergraduates student in Ipoh

Assessment of knowledge
1. Do you know how to differentiate whether a health supplement is clinically proven or not?
2. Non-clinically proven health supplements can give serious adverse effects to your body
3. Do you know where to get information about health supplements whether it is clinically proven or not.
4. Does the health supplement label help you to know if the supplements give benefits to you or not
5. Health supplement usage can be a risk rather than benefits
6. Health supplement can actually lead to medical complications and drug interferences
7. Can supplements be used to treat, prevent or cure diseases
8. All supplements should be registered under National Pharmaceutical Regulatory Agency
9. Every registered drug is given a registration number, which must be printed on its label package
10. Excessive usage of health supplements can actually lead to organ failure.