Dietary Supplement Consumption among Personnel in Rajavithi Hospital

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Background: *Dietary supplement consumption (DSC) has become popular due to its potential ability to increase one's intake of nutrients and thereby relieve disease. The amount of dietary supplement use varies depending on setting and subjects, and thus far, the association between demographic and lifestyle factors and dietary intake have not been studied in hospital personnel.*

Objective: *This study aimed to assess dietary supplement use and factors associated with it among personnel in Rajavithi Hospital.*

Material and Method: *A cross-sectional study was conducted between January and June 2016. Four hundred staff who had worked in the hospital for at least one year were recruited; they completed a self-administered questionnaire which consisted of queries relating to their demographic characteristics such as age, gender, education, underlying diseases, health behavior, types of supplement and reasons for choosing to take dietary supplements. The differences between qualitative and quantitative variables were calculated using Chi-square and Student t-test as appropriate, and binary logistic regression was employed for factors associated with DSC. The ethics committee of Rajavithi Hospital approved the present study.*

Results: *The majority of the participants were female, and the mean age (±SD) was 40.40±11.18 years. Just over two-thirds (67.1%) had normal BMI, and the prevalence of dietary supplement use was 25.5%. Five factors were significantly associated with the use of dietary supplement: increasing age (OR = 0.97; 95% CI: 0.95 to 0.99; p = 0.008); educational level higher than bachelor degree (OR = 2.55; 95% CI: 1.23 to 5.28; p = 0.012); stomachache (OR = 2.16; 95% CI: 1.05 to 4.45; p = 0.036); poor sleep quality (OR = 1.93; 95% CI: 1.17 to 3.18, p = 0.010); and diet avoidance (OR = 1.90; 95% CI: 1.09 to 3.31, p = 0.024). The most common reasons for the consumption of dietary supplements were their having obtained the approval of the food and drug administration, and their easy availability.*

Conclusion: *Dietary supplement consumption was low compared to the findings of other studies in the literature. Age, education, stomachache, sleep quality, and diet avoidance were factors associated with DSC. Hospital personnel should take special care to use supplements rationally and be aware of their risks and adverse side effects.*

Keywords: *Dietary supplement consumption, Vitamins, Nutritional behaviors, Nutrients*

J Med Assoc Thai 2018; 101 (Suppl. 2): S144-S149
Full text. e-Journal: *http://www.jmatonline.com*

Dietary supplements, including single-ingredient products, vitamins, minerals and other substances, have become popular worldwide following recent advances in medicine and improvements in people's economic status. Research has shown that the reasons for the increasing use of dietary supplements include: health maintenance; a response to changes in eating patterns or health status due to changes in acute or chronic disease; anti-aging medicine; safety of the consumer food supply; and control over self-care[1]. According to research published in the early 2000s by the US National Health and Nutrition Examination Survey (NHANES), a national cross-sectional study of health and nutrition indicated 52.0 percent of adults had taken a dietary supplement in the past month. The most popular supplements taken by adults included multivitamin or multimineral, vitamin C, vitamin E, B-complex vitamins, and calcium[2]. Moreover, seventy percent of older adults aged ≥60 years in the 2011 to 2014 NHANES had used ≥1 dietary supplement in the past 30 days[3]. The prevalence of dietary supplement use varies, as does the availability of information about it, in European countries[4]. The attention of the media has been attracted to herbal and dietary supplement because of its popularity in social networks,

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advertisements and health clubs. The principal reason why diabetic patients take these supplements are recommendations by friends, relatives, and social media[5]. The general population in Bangkok report that they use herbal and dietary supplements because they are effective, people are curious about them, and also there are safety concerns about conventional medicines[6].

Factors affecting dietary supplement consumption vary with different study populations. A study of the prevalence of dietary supplement use and factors associated with it among Korean adults found that the overall prevalence of taking supplements was 21.8% and 32.0% for males and females, respectively. The use of dietary supplement was associated with many factors such as female gender, advancing age, higher monthly income, residing in large cities, and bone disease[7]. Additionally, a cross-sectional study aimed at determining the prevalence of food supplement use and factors associated with it among a population aged ≥50 years in Ireland, found that female gender, retired, non-smoker, higher education and living alone were significantly related to consuming dietary supplements[8]. The prevalence of dietary supplement consumption and factors associated with it differ widely and are not well reported in hospital personnel who have to perform their job optimally in every condition. Up-to-date information on supplement consumption among hospital personnel is not well document, and we were unable to identify published studies determining the prevalence of dietary supplement consumption and its associated factors in these settings. Therefore, the present study aimed to examine the prevalence of the use of dietary supplements, and factors influencing it, in personnel in a tertiary hospital in Bangkok.

Material and Method

A descriptive cross-sectional study was conducted between January and June 2016 of 400 personnel in Rajavithi Hospital, a tertiary referral hospital in Bangkok, Thailand. The only criterion for recruitment of participants was work experience in their current position of at least one year. A semi-structured self-administered questionnaire was distributed to the participants.

The questionnaire comprised three sections. The first section contained inquiries about basic demographic and socio-economic data, including age, sex, occupation, work type, education, income, underlying diseases, sleep behavior and exercise. The second part of the questionnaire sought to obtain information about participants' knowledge of dietary supplements. The third part related to reasons for choosing dietary supplements. The present study was reviewed and approved by the ethics committee of Rajavithi Hospital, and informed consent was obtained from all participants in the present study.

Data were analyzed using SPSS version 17.0 (SPSS Inc., Chicago, Illinois, USA). Baseline characteristics were analyzed using descriptive statistics such as number, percentage, mean and standard deviation, minimum and maximum. Chi-square or Fisher exact test were used to compare the categorical variables and frequency differences. Student's t-test was used to compare continuous variables between the groups consuming and not consuming dietary supplements. The 95% confidence intervals were computed, and binary logistic regression was performed to assess the factors associated with dietary supplement consumption. A *p*-value of less than 0.05 was set as statistically significant.

Results

Of the 400 participants enrolled in the present study, the user and non-user of dietary supplement groups had similar demographic characteristics. The majority of the participants were female (83.8%) with mean age (±SD) of 40.40±11.18 years. The average age was 37.75±10.76 years in the user group and 41.31±11.18 years in the non-user dietary supplement group, and 72.8% of the participants were non-clinical staff. Most of them had educational level lower than bachelor's degree, were single, had normal BMI and earned a monthly income in excess of 20,000 Thai baht. There were significant differences between the two groups in relation to both mean age and educational levels. The findings revealed that 25.5% (n = 102) of total subjects had experience of dietary supplement as seen in Fig. 1 Baseline characteristics of the participants are shown in Table 1.

There were significant differences between the two groups in terms of health biomarkers and health behavior. The supplement users had significantly higher incidence of stomachache, alcohol consumption, poor sleep quality and diet avoidance than those in the non-user supplement group, while, other health biomarkers and behavior such as underlying diseases, smoking and drug use were similar in the two groups.

Regarding knowledge about dietary supplements, those who took supplements had slightly higher mean scores of knowledge than those who did

not (6.49±2.33 vs. 6.36±2.44); however, this difference was not significant.

The users of dietary supplements were asked about product selection, reason for use, frequency of use and their opinions about dietary supplements. Regarding product brand, Blackmore (28.4%) and Nutrilite (19.6%) were the two most popular choices.

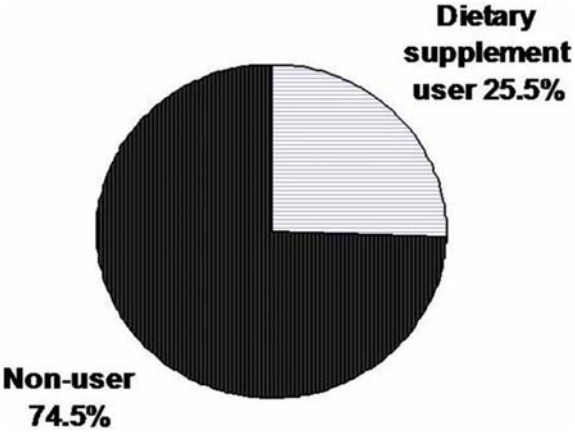

Fig. 1 The prevalence of dietary supplement consumption.

Supplements were used to nourish health and strengthen the body (68.6%), enhance beauty (18.6%) and decrease cholesterol and hypertension (12.7%). Dietary supplements were most commonly taken for less than 3 months (32.4%). Almost 60% of the users paid less than 1,000 Thai baht at a time to purchase products. Most of the users mentioned that the dietary supplements were quite costly (60%). Media advertisements about supplements on the internet were the major incentives to buy (68.6%), followed by commercials on TV (62.7%) and in magazines (47.1%). Most of the supplement users bought the products once a month. The supplement products were usually taken in the morning (61.8%). The user's opinion after use was that the dietary supplements led to feelings of improved health and a reduction in levels of fatigue (33.3%), helped them to acquire good and bright skin (27.5%), and achieve self-control weight loss (19.6%). The main motivations for using supplements were: product properties (40.2%); product quality certification (30.4%); and recommendation from relatives and friends (9.8%).

Current users and those who had used dietary

Table 1. Baseline characteristics categorized by dietary supplement users and non-users

Characteristics	Total (n = 400)	Dietary supplement		*p*-value
		Non-user (n = 298)	User (n = 102)	
Sex				0.155
Female	335 (83.8)	245 (82.2)	90 (88.2)	
Male	65 (16.2)	53 (17.8)	12 (11.8)	
Age (years)	40.40±11.18	41.31±11.18	37.75±10.76	0.005*
BMI (kg/m^2)				0.159
<24.99	255 (67.1)	180 (64.5)	75 (74.3)	
25.00 to 29.99	91 (23.9)	74 (26.5)	17 (16.8)	
≥30	34 (8.9)	25 (9.0)	9 (8.9)	
Marital status				0.170
Single	183 (47.2)	128 (44.6)	55 (54.5)	
Married	177 (45.6)	139 (48.4)	38 (37.6)	
Divorced, separated	28 (7.2)	20 (7.0)	8 (7.9)	
Education				<0.001*
Lower than bachelor degree	172 (45.4)	140 (50.4)	32 (31.7)	
Bachelor degree	163 (43.0)	115 (41.4)	48 (47.5)	
Higher than bachelor degree	44 (11.6)	23 (8.1)	21 (20.8)	
Monthly income				0.195
Less than 10,000 baht	70 (18.0)	57 (19.9)	13 (12.9)	
10,001 to 15,000 baht	89 (22.9)	64 (22.3)	25 (24.8)	
15,001 to 20,000 baht	87 (22.4)	66 (23.0)	21 (20.8)	
Over 20,001 baht	142 (36.6)	100 (34.8)	42 (41.6)	

The number may not add up due to missing data, * Significant at $p<0.05$

supplements in the past were asked about four main factors influencing the purchase of food supplements. With regard to products they bought, food and drug administration (FDA) approved supplements were considered most reliable. In relation to distribution channels, the convenience, availability and reliability of retailers were also important while price and value for money were the most important factors. Lastly, marketing promotions via easy-to-access media advertisements also influenced the purchase of supplement products.

The associations between factors influencing dietary supplement consumption are presented in Table 2. Five factors were significantly associated with the use of dietary supplement: increasing age (OR = 0.97; 95% CI: 0.95 to 0.99; $p = 0.008$); educational level higher than bachelor degree (OR = 2.55; 95% CI: 1.23 to 5.28; $p = 0.012$); stomachache (OR = 2.16; 95% CI: 1.05 to 4.45; $p = 0.036$); poor sleep quality (OR = 1.93; 95% CI: 1.17 to 3.18, $p = 0.010$); and diet avoidance (OR = 1.90; 95% CI: 1.09 to 3.31, $p = 0.024$).

Discussion

In the present study, the prevalence of dietary supplement consumption and its association with demographics, lifestyle and health behavior were observed. Literature reviews have noted the increased use of dietary supplements including a growing number of patients who consume herbal remedies and synthetic vitamins alongside conventional medication. This current survey found that 25.5% of the participants had used dietary supplements, which was lower than recent estimations of use of dietary supplements in the United States. This could be due to the different age groups and lower prevalence of underlying diseases of their participants compared to those in the current study. The 2011 to 2014 NHANES study found 70.0% of older adults aged ≥60 years had used ≥1 dietary supplement in the preceding month[3], while the average age of the present participants was about 40 years. Dietary supplement use tends to be more prevalent among older adults than younger individuals because their motivations relate to site-specific reasons like heart, bone and joint, and eye health[9,10]. In addition, the use of dietary supplements has varied in different studies, depending on how the use of dietary supplements was ascertained, the studied subjects, and the study design.

The present study showed that educational level was positively associated with supplement use, and people with high educational levels were more likely to use supplements. This is in agreement with another study in the literature which reported that higher educational level was associated with supplement consumption[10,11]. The explanation is related to health and economic status. Knowledgeable people tend to have a healthier lifestyle, are more aware of the benefits of supplements, and have better dietary patterns in order to seek alternative health treatment or remedy. The evidence indicates that users of dietary supplements tend to incorporate products into their lifestyles as part of a broader emphasis on healthy living[11]. As seen both in this study and in others, the use of dietary supplements is associated with quality of sleep. Previous research also suggests that some supplements such as vitamin D improve pain levels, sleep quality and quality of life[12,13]. Moreover, the supplementation of vitamin D is associated with good sleep hygiene and may have a therapeutic role, not only in sleep disorders but also in the prevention and treatment of chronic pain conditions[14]. The use of alternative treatments such as herbal and dietary

Table 2. Factors associated with dietary supplement consumption

	Crude OR (95% CI)	*p*-value	Adjusted OR (95% CI)	*p*-value
Age	0.97 (0.95 to 0.99)	0.006	0.97 (0.95 to 0.99)	0.008*
Education				
Bachelor degree	Ref		Ref	
Lower than bachelor degree	0.55 (0.33 to 0.91)	0.021	0.62 (0.30 to 1.07)	0.084
Higher than bachelor degree	2.19 (1.11 to 4.32)	0.024	2.55 (1.23 to 5.28)	0.012*
Stomachache	2.87 (1.48 to 5.56)	0.002	2.16 (1.05 to 4.45)	0.036*
Drinking alcohol	1.68 (1.01 to 1.82)	0.049	1.58 (0.89 to 2.78)	0.117
Poor sleep quality	1.71 (1.08 to 2.70)	0.022	1.93 (1.17 to 3.18)	0.010*
Diet avoidance	2.03 (1.23 to 3.54)	0.006	1.90 (1.09 to 3.31)	0.024*

OR (95% CI) = Odds Ratio (95% confidence) from Binary Logistics Regression, *Significant at $p<0.05$

supplements is common among patients with diabetes, hypertension, and cardiovascular diseases all over the world[7,15]. The prevalence of supplementary dietary use was high when there was a presence of medical conditions, symptoms and risks. Our research also showed that the participants who had health symptoms such as stomachache were associated with using dietary supplements. Some studies have revealed adverse effects after using dietary supplements, but none were observed in the current study. The prevalence of dietary supplements in Japan revealed 8.8% of consumers developed adverse events including diarrhea, constipation, stomachache, headache, and nausea and vomiting[16].

The current study revealed that diet avoidance was related to supplement consumption. Some people have specific aims such as reaching a pre-set goal like increasing sports ability or expediting rehabilitation. Previous research indicated that consumption of dietary supplements is highest among athletes who wanted to increase stamina and improve performance. The longer the athlete had practiced the sport, the higher the training volume and the greater the intake of supplements. The most consumed supplements were carbohydrates, vitamins, and proteins. Supplement consumption by road runners in Brazil appeared to be guided by the energy-boosting properties of the supplement, the influence of coaches, and the experience of the user[17].

Our results indicated that the important reasons for using dietary supplements were to improve or maintain health status and wellness, which may or may not include the prevention or treatment of any disease. This is consistent with a prior study of American adults who used supplements to improve or maintain overall health, support bone health, and fill nutrient gaps[11]. Given the tremendous increase in advertising of commercially available dietary supplements in recent years, accessible media such as social networks, the internet and TV have had an effective rating for products.

To our knowledge, the present study is the first investigation into the supplement use and its associated factors specifically in hospital personnel. Only a few studies have reported on general populations at bus stops and CKD patients in Bangkok. Some limitations of this research should be noted. We were not able to quantify the actual amount of supplement intake; furthermore, the findings of this study should be interpreted with caution because the data obtained was self-reported. Similar to the findings of other studies that relied on self-reported data, there is some unknown degree of measurement error inherent in the information when dietary supplement use is not documented by other measures such as direct examination of dietary products used.

Conclusion

These findings suggest that the prevalence rate of dietary supplement was low compared to other studies in the literature. The factors closely associated with dietary supplement intake were demographic, lifestyle, and disease variables. Health improvement was the main incentive for using dietary supplements in this study setting.

What is already known on this topic?

Previous studies mainly focused on the prevalence of dietary supplement and related factors specifically in the elderly and the ill. However, prevalence rates vary depending on study subjects and settings.

What this study adds?

Few studies have focused on dietary supplements in middle-aged Thai adults. The present study therefore determined the prevalence of dietary supplement in one setting area, namely health personnel in a hospital, and reasons for choosing dietary supplements were also determined.

Acknowledgements

This study was supported by a research fund from Rajavithi Hospital, and the authors wish to thank all the individuals who contributed data for the purposes of this study.

Potential conflicts of interest

None.

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