Research Article

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The Relationship between Health Literacy and Food Supplement Product Consumption Behavior of the Elderly

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Abstract

This research is a survey research study by conducting a cross-section research, which aims to examine the level of health literacy of the elderly, to study the relationship between demographic characteristics and health literacy, and to discover the relationship between health literacy and food supplement product consumption behavior of the elderly. Systematic random sampling was employed. Questionnaire were used to collect the data from 353 elderly at Lak Hok, Mueang, Pathum Thani, Thailand. The data was analyzed using descriptive statistics, including frequency, percentage, mean, minimum, maximum and standard deviation. Moreover, to analyze the relationships between study variables using the Chi-square and Pearson's correlation coefficient statistic, the p-value of .05 was considered statistically significant. The results showed that the participants had a mean age of 68.17 years old. Most of them were female (66.3%), the participants had inadequate health literacy (Mean = 152.01, SD. = 53.43). Elderly people had high scores on dietary supplement consumption behavior (Mean = 53.15, SD. = 14.19). Chi-square and Pearson's correlation coefficient analysis showed that age, education level, occupation, household income, and source of income are significant related to health literacy at p <0.05. The relationships between health literacy and sex, marital status was not found. Health literacy significantly related to food supplement consumption with statistical significance of .05 (r=0.380, p <0.001). The results of this study suggest that health literacy and food supplement product consumption behavior need to be further supported in elderly from government agencies. And there should be a field inspection of dietary supplements in pharmacies and stores.

Keywords: Health literacy, Food supplement, Elderly, Consumption behavior

What was Known

- Elderly had a high level of health literacy and preventing the incorrect consumption of food supplement products.
- Health literacy is highly correlated with food supplement product consumption behavior in the elderly.

What's New and Next

- Qualitative research should be conducted to elicit more in-depth information regarding health literacy and food supplement product consumption behavior of the elderly.
- The process of increasing the health literacy level of the elderly should be studied.

Introduction

Currently, food supplement products are playing an increasingly significant role in the daily lives of Thai individuals. Thai people have developed a preference for incorporating food supplement products into their routines. Failing to consider the body's absorption capacity when consuming food supplement products can lead to the accumulation of residues, which can cause various health issues. These health problems may include bleeding disorders, irregular heartbeats, and acute kidney failure, among others[1]. According to data from the National Statistical Office, the consumption of food supplement products among Thai people has risen from (19.1%) in 2013 to (21.6%) in 2017, as supported by a survey conducted by a global marketing database[2].

A report on vitamins and food supplement products in Thailand reveals a consistent annual increase in the market value of vitamins and food supplement products from 1980 to 2020. In 2018, the total market value reached 62,358 million baht (7.1%) increase from the previous year. Furthermore, it is predicted that sales will continue to rise between 2021 and 2025[3]. Based on the aforementioned information, it is evident that Thai individuals have a strong interest in the consumption of food supplement products.

When examining the proportion of food supplement products usage among different age groups in Thailand, it was discovered that the elderly tend to consume the most. According to the National Statistical Office, individuals aged 60 and above are the highest consumers of food supplement products (23.9%). Additionally, the central region has the highest percentage of individuals who take food supplement products 5-6 days a week (1.5%)[4]. At the provincial level, it was observed that elderly individuals in Pathum Thani Province spend an average of 333 baht

per month on purchasing food supplement products and often purchase more than 2 types of food supplement products[5, 6]. It is evident that the elderly spend a significant amount of money on consuming food supplement products. Encouraging them to prioritize their health by avoiding excessive consumption of these food supplement products would not only reduce costs but also minimize potential negative effects on their health.

One way to promote the proper consumption of food supplement products is by enhancing individuals' skills in selecting and using them. Health literacy plays a crucial role in helping people make informed decisions about their health, and it encompasses various aspects such as access, cognitive, communication skill, decision skill, self-management, and media literacy[7]. These components can be categorized into three levels: basic/functional health literacy, communicative/interactive health literacy, and critical health literacy. Having knowledge about health literacy is particularly important for the elderly, as it enables them to make appropriate choices regarding food supplement products.

It should be noted that consuming inappropriate food supplement products can lead to adverse effects, which is why it is necessary to raise awareness about the risks associated with their misuse. Data from the Lak Hok Sub-district in Mueang Pathum Thani District reveals that the elderly population in this area had the highest number of adverse reactions related to the consumption of medicines and food supplement products. Additionally, it was observed that there has been an increase in the consumption of food supplement products among the elderly in this community, as evidenced by the data collected during the project aimed at reducing the intake of sweet, oily, and salty foods at the Lak Hok Sub-district Health Promoting Hospital in Village No. 1 and Village No. 7. There has been an increase in food consumption from 2012 to 2019-2021, with the percentages being (29.0%), (39.0%), and (90.0%), respectively. It has been observed that elderly individuals with chronic diseases have been taking food supplement products for over a year (80%), and consuming more than 2 types of food supplement products per day (65.0%). Some adverse symptoms experienced include nausea and dizziness[8]. The concern is that the elderly are taking these food supplement products without considering the potential side effects on their health or the potential interactions with their medications. This could potentially be harmful to their health.

Conducting a study on the relationship between health literacy and food supplement product consumption behavior among the elderly will provide valuable information for implementing measures to prevent the improper consumption of food supplement products.

Materials and Methods

Methodology

This study was a cross-sectional survey study.

Population and sample: The population of the study consisted of people aged 60 years and over, both men and women, are elderly people in the social group whose names are listed in the house registration of Lak Hok Sub-district, Mueang District, Pathum Thani Province, totaling 4,170 people.

Sampling method

The sample size was calculated using estimating the exact proportion of the population[9] was equal to 353. People in order to meet the specified number and the sample had equal opportunities. By sorting the elderly social bound according to the list of Lak Hok Sub-district Health Promoting Hospital. Then, perform Systematic Random Sampling finding the ratio between the population and the sample. The sampling interval was equal to 12. After that, a simple random drawing is done to find the starting members. From one member in number 1-12, the next member's number is systematically assigned with the same distance between everyone. Continue doing this until there are 353 people.

The study participants were selected and included in the study using purposive sampling. Inclusion criteria were 1) People aged 60 years and over, regardless of gender. 2) There is a name in the house registration of Lak Hok Sub-district, Mueang District, Pathum Thani Province. A group of social bound and can help themselves. 3) Take 1 or more food supplements product within the past 6 months. 4) No psychosis or neurosis who can communicate in Thai and can provide information by yourself. The exclusion criteria were 1) No, the samples selected for the study will not be excluded from the study.

This study used health literacy which is divided into 6 elements according to the concept of the Health Education Division. And divide the level of health literacy into 3 levels according to the concept of Don Nutbeam was used as the conceptual framework of the study **(Figure 1).**

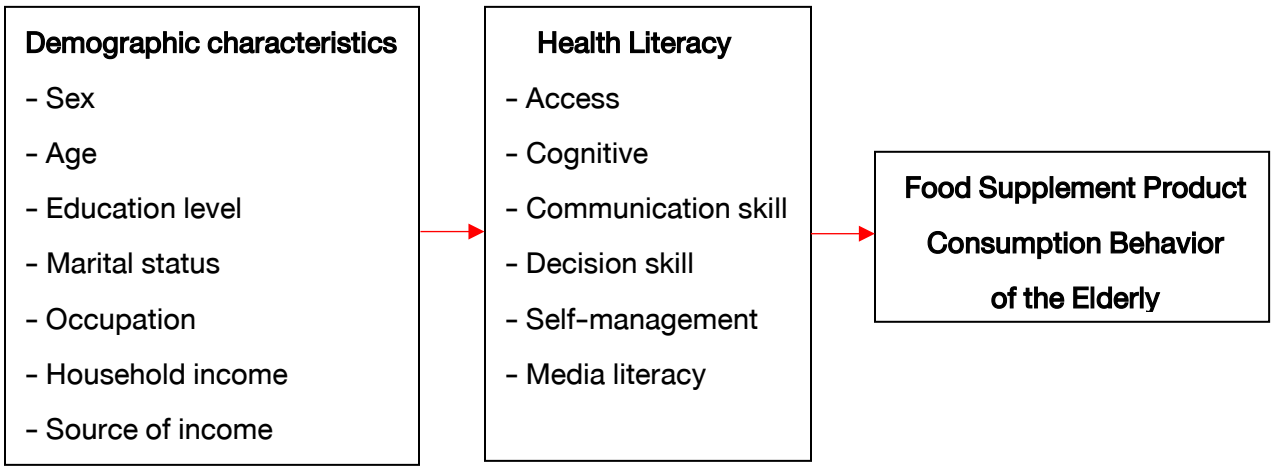

Figure 1. the conceptual framework of the study

Data collection and instruments

Data was collected period is from October 2022 to January 2023. Following approval of the study by the Research Ethics Office of Thammasat University. Subsequently, researcher conducted the instrument tryout process with 30 elders from Ban Mai Sub-district, Mueang District, Pathum Thani Province. And the researcher requested permission to collect data from the Human Research Ethics Committee of Pathum Thani Provincial Public Health Office. After approval the researcher plans to collect data in the area. And telephone the sample group to request cooperation in answering the questionnaire from the sample group. And make an appointment for a date and time to meet the sample group at their home to request data collection. The researchers and assistant researchers clarify the research purpose. After the sample agrees, sign the study in the consent form. Two assistant researchers requested consent. Data collection will be conducted together with the assistant researchers. The sample group completed the questionnaire once and it took an average of 30 minutes to complete. Research instruments in this study are comprised of three data collection instruments as follows: Demographic characteristics questionnaire, health literacy questionnaire and Food supplement product consumption behavior questionnaire.

1) Demographic characteristics questionnaire including sex, age, education level, marital status, occupation, household income and source of income. The questionnaire answers are a form of fill in words and check list, totaling 7 questions.

2) health literacy questionnaire. In this research, the researcher created a questionnaire by reviewing the literature and used it as a guideline for creating the questionnaire. And revised according to the recommendations of the advisor, the instruments were a 60 item questionnaire in which all questionnaires were positive questions. The questions were answered through a five-point rating scale. They were used to assess health literacy regarding the consumption of food supplements product, such as never = 1, sometimes = 2, rarely = 3, often = 4, and always = 5. The questionnaires related to 6 elements that included access (10 items), communication skill (10 items), decision skill (10 items), self-management (10 items) and media literacy (10 items). The cognitive questionnaire had only one correct answer. A correct answer received 1 point. A wrong answer or cannot answer 0 points (10 items).

Scoring criteria are set according to the health literacy level classification criteria of health education division. A higher score indicates an adequate level of health literacy about food supplements product consumption behavior, with the health literacy in 5 elements score divided into three groups: high (40 – 50 points) moderate (30 – 39 points) and low (0 – 29 points). As for health literacy, Cognitive score divided into three groups: high (8 – 10 points) moderate (6 – 7 points) and low (0 – 5 points). And overall health literacy score divided into three groups: adequate (206 - 260 points) marginal (154 - 205 points) and inadequate (0 – 153 points). As regards reliability for the questionnaire, Cronbach's Alpha was equal to 0.977.

3) Food supplement product consumption behavior questionnaire.

The questionnaire was divided into two parts. The first part consisted of 5 items. The questionnaire is a questionnaire for recording information on food supplement product consumption of each informant. The questionnaire answers are a check list.

The second part, this questionnaire is a questionnaire to measure the food supplement product consumption behavior of each informant and adapted from the questionnaire on interpersonal factors affecting current consumer health product consumption behavior changes, Institute for population and social research[10]. The instruments were a 20 item divided into positive questions 10 items and negative questions 10 items. The questions were answered through a four-point rating scale. Scoring criteria for positive questions are: never = 4, sometimes = 3, often = 2, and always = 1. Answers to negative statements are scored in reverse. A higher score indicates a high level of food supplements product consumption behavior, with the food supplements product consumption score divided into three groups: high moderate and low. As regards reliability for the questionnaire, Cronbach's Alpha was equal to 0.913.

Data analysis

Demographic characteristics and health literacy were analyzed using descriptive statistics including number, percentage, mean, and standard deviation. The relationships between demographic characteristics and health literacy statistics were analyzed with the Chi-square test. Finally, the relationships between health literacy and food supplement product consumption behavior were analyzed by means of Pearson correlation statistics because when checked with the Kolmogorov-Smirnov test, it was found that the data has a normal curve distribution.

Results

Demographic characteristics of the samples

The total sample was 353 people, more than half of the participants were female (66.30%) and the sample had an age range of 60 - 97 years, with an average age of 68 years (SD = 6.87). The largest age group was from 60-69 years (61.2%). The education level of most samples is primary school or below (72.8%). Most of the sample (51.3%) were married, the occupation of the sample were unemployed (54.4%). The average household income from each source exceeds 30,000 baht, with a minimum income of no income. Most income is below 1,000-10,000 baht per month or less than (66.0%) and the sample had more than one source of income (34.0%) **(Table 1).**

Health literacy regarding food supplements product of the samples

Health literacy in 6 elements of the samples, the overall health literacy of the samples was inadequate level (M = 152.01, SD = 53.43). In considering the health literacy subscale, samples had low health literacy levels. These included access, communication skill, decision skill, and media literacy. The cognitive shows that the mean score is 8.13 (S.D. = 2.32) but self-management shows that the mean score is 33.93 (S.D. = 12.54) with a high health literacy level.

Regarding food supplement product consumption behavior of the samples, overall showed a high level of food supplement product consumption behavior (M=53.15 SD=14.19) **(Table 2).**

Table 1 Demographic characteristics of the sample (n=353)

Demographic characteristics		n (%)
Sex	Male	119 (33.70)
	Female	234 (66.30)
Age (year)	60 – 69 years old	216 (61.20)
	70 – 79 years old	110 (31.20)
	≥80 years old	27 (7.60)
Mean= 68.17 years old S.D.= 6.87 Min.= 60 years old Max.= 97 years old		
Education level	Primary school or below	257 (72.80)
	Secondary school	63 (17.90)
	Higher education and high	33 (9.30)
Marital status	Married	181 (51.30)
	Divorced/Separated	172 (48.70)
Occupation	Employed	161 (45.60)
	Unemployed	192 (54.40)
Household income (baht)	<1,000 – 10,000	233 (66.0)
	10,001 – 20,000	93 (26.30)
	20,001 – 30,000 or high	27 (7.70)
Source of income	Occupation	82 (23.20)
	Pension	19 (5.40)
	Family	27 (7.60)
	Elderly allowance	105 (29.80)
	>1 Source of income	120 (34.0)

Table 2 Health literacy regarding food supplements product of the samples (n=353)

Health literacy	n (%)	Mean(SD)	Interpretation
Overall Health literacy	163 (46.2)	152.01 (53.43)	Inadequate
Access	237 (67.10)	24.41 (11.18)	Low
Cognitive	252 (71.40)	8.13 (2.32)	High
Communication skill	224 (63.50)	24.81 (11.12)	Low
Decision skill	146 (41.40)	30.28 (12.25)	Low
self-management	157 (44.50)	33.93 (12.54)	High
Media literacy	149 (42.2)	30.43 (13.35)	Low
Overall food supplement product consumption behavior	204 (57.8)	53.15 (14.19)	High

The total sample was 353 people, all of the sample group had taken dietary supplements in the past 6 months. More than half used to take them but stopped (55.2%). Family members bought for them (45.0%). Most of the sample (88.1%) consumed 1-2 types of food supplement product. The sample had an average monthly purchase of food supplement product less than 500 baht (52.7%) **(Table 3).**

Table 3 Personal food supplement product consumption behavior of the samples (n=353)

Consumption behavior of food supplement product		n (%)
Food supplement products taken in the past 6 months	Eat	353 (100.0%)
Characteristics of food supplement products	Used to take them but stopped	195 (55.2%)
	Currently taking them	158 (44.8%)
Obtained food supplement products	Family	159 (45.0%)
	Themself	126 (35.7%)
	Doctor	55 (15.6%)
	A friend	13 (3.7%)
Number of food supplement products consumed	1-2 types	311 (88.1%)
	3-4 types	40 (11.3%)
	≥5	2 (0.6%)
Average value of monthly food supplement products (baht)	<500	186 (52.7%)
	501-1000	138 (39.1%)
	>1000	29 (8.2%)

Relationship between Demographic characteristics and health literacy

The findings showed that age, education level, occupation, household income, and source of income are significant related to health literacy at p <0.05, but the relationships between health literacy and sex, marital status was not found. A Chi-square statistic was used **(Table 4).**

Table 4 The relationship between Demographic characteristics and health literacy (n=353)

Demographic characteristics	x^2
Sex	1.293
Age	19.396**
Education level	10.774*
Marital status	0.070
Occupation	10.342**
Household income	12.875*
Source of income	22.021**

*p <.05, **p <.01

Relationship between health literacy and food supplement product consumption behavior

The findings showed that health literacy 6 elements were associated with food supplement product consumption behavior with statistical significance. A Pearson's correlation coefficient statistic was used **(Table 5).**

Table 5 The relationship between health literacy and food supplement product consumption behavior (n=353)

Health literacy	r
Overall Health literacy	0.380**
Access	0.222**
Cognitive	0.179**
Communication skill	0.250**
Decision skill	0.356**
self-management	0.412**
Media literacy	0.415**

**p <.001

Discussion

Health literacy related to food supplement product consumption behavior. More than half of the sample were aged 60-69 years (61.2%) and had received primary school education or less (72.8%). The results found that most of the sample had marginal and inadequate health literacy (81.6 %) Only (18.4%) have adequate health literacy. When considering all 6 elements of health literacy, it was found that the sample had a high score in cognitive regarding food supplement product (71.4%) and in self-management regarding the consumption of food supplement product (44.5%). This is because the sample understands and can manage their own consumption of food supplement product. But for other elements, the sample group had scores at the low health literacy levels. Consistent with related studies, it was found that the most of the sample have received primary school education or below[11,12]. Because the compulsory education system previously placed the curriculum only in fourth grade, most elderly people mostly completed their education at the primary school level. Therefore, there is not a very high level of academic understanding.

The sample group had a high score for food supplement product consumption behavior (57.8%). The results found that in the past 6 months, all sample groups had consumed food supplement products. The sample group received food supplement products from family who purchased them (45.0%) and take 1-2 types of food supplement products (88.1%), consistent with related studies. It was found that the most of elderly people take 1-2 types of food supplement products. The food supplement products are provided by the family[13, 14]. It reflects that the elderly are interested in consuming food supplement products. Due to increasing age, the body may become less healthy. Elderly people therefore choose to consume food supplement products because they believe that food supplement products will help make the body stronger. Most of the elderly live together as a family. The family then procures food supplement products for them to take.

Demographic characteristics that have a statistically significant relationship with health literacy (p <0.05) include age, education level, occupation, household income and source of income. A very important factor is age, because early elderly people learn more than other elderly people. But as they get older, their ability to learn will decrease. This is consistent with previous studies that found that age has an important relationship with health literacy, with increasing age causing the elderly to have insufficient health literacy[15, 16, 17].

The results of this study found that health literacy has a variable relationship with food supplement product consumption behavior (r=0.380, p <0.001). This explains that health literacy is related to various processes and activities involved in Searching, selecting, purchasing, consuming, and post-consumption evaluation of food supplement product. This is consistent with previous studies that found that health literacy about health supplements product. It is related to the behavior of using health supplements product with statistically significant (p <0.05)[18]. The sample group has increased health literacy to adequate level. It will result in an increase in the behavior of taking care of one's own health. Therefore, the sample group has inadequate health literacy, they should be developed to have increased health literacy to take better care of their own health.

Conclusion

The researchers found that health literacy related to food supplement product consumption behavior. Medical personnel should therefore increase their level of health knowledge regarding the consumption of food supplement products. By organizing a training project to increase health literacy skills. Prevent the consumption of incorrect food supplement products. Healthcare professionals should review household food supplement products and educate families of elderly people. There should be a field inspection of food supplement products in pharmacies and stores. Pharmacists and sellers should clearly explain food supplement products information to prevent purchasing food supplement products that are not suitable for the body. The Ministry of Public Health should have measures to solve the problem of excessive consumption of food supplement products and reduce the intake of food supplement products that are inappropriate for the body of the elderly. In the future, the health literacy of the elderly should be studied in the form of qualitative research. To study information in depth to gain multi-dimensional knowledge and a complete perspective on the behavior of the elderly and used to solve health problems of the elderly.

Ethical Approval Statement

This study was approved by The Ethics Committee of Thammasat University (COA No. 083/2565). Date of permission to conduct research on October 19, 2022.

Author Contributions

RT designed the study and formulated the content of the tools and questionnaires. RT designed the tools and questionnaires, with guidance from WR, RJ conducted the study under

the supervision of WR, RT carried out reliability testing and the initial statistical analysis of data, following advice from WR. RT re-analyzed the data and wrote the manuscript. All authors read and approved the manuscript prior to submission for publication.

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Conflicts of Interest

The authors have no conflicts of interest to declare.

References

1. Somsri P, Sanlayawet L, Thirachai C, Bunrat U, Kidaphon W, Chatri B, et al. Drugs, supplements, and toxins that have a negative impact on the kidneys. 1th ed. Nonthaburi: Health works plus; 2017. (In Thai)
2. Euromonitor International. Consumer Health Global Industry Overview 2020.
3. Chadaphon L. Feasibility study of improvement business plan of dietary supplement product from sea squirt extract, rice bran oil vitamin e for maintain your brain and preventing Alzheimer's disease in people who have risk brain disease. [Master of Management Program in Management, Thesis in Food Business Management]. Nakhon Pathom: College of Management, Mahidol University; 2020.
4. National Statistical Office. The 2017 Food Consumption Behavior Survey. Bangkok: 2018. (In Thai)
5. National Statistical Office. The Household Socio-Economic Survey in 2018. Bangkok: 2019. (In Thai)
6. Pathum Thani Provincial Statistical. Provincial statistical report: 2020. (In Thai)
7. Watcharaphon C. Health Literacy: Concept and application for nursing practice. Royal Thai Navy Medical Journal 2017; 44(3): 183-197. (In Thai)
8. Lak Hok Sub-district Health Promoting Hospital Village No.1. Sweet, Oil, and Salty Project Report 2021. (In Thai)

9. Sirima M. Biostatistics in Public Health. 2th ed. Bangkok: Charansanitwong printing; 2015. (In Thai)
10. Food and Drug Administration Ministry of Public Health. Research project on factors affecting current consumer health product consumption behavior changes. Institute for Population and Social Research: Mahidol University; 2015. (In Thai)
11. National Statistical Office. The 2021 Survey of The Older Persons in Thailand. Bangkok: 2022. (In Thai)
12. Witthaya C. Health Literacy of Self-care Behaviors for Blood Glucose Level Control in Patients with Type 2 Diabetes, Chainat Province. [Master Degree of Public Health, Thesis in Health Promotion Management]. Pathum Thani: Faculty of Public Health, Thammasat University; 2016.
13. Suphannika S. Behaviors and demands of elderly dietary supplement in Thailand. Journal of Humanities & Social Sciences 2020; 10(3): 12-21. (In Thai)
14. Kanchana P, Saowalak T. Opinions and Consumption Behaviors of Supplementary food products Among the elderly in Nongbu village, Sam Phrao Sub-district, UdonThani Province. UdonThani Hospital Medical Journal 2020; 28(2): 121-129. (In Thai)
15. Pichsupagarn T. Relationship between health literacy and health promotion behaviors of postpartum mothers in HRH Maha Chakri Sirindhorn Medical Center. [Master Degree of Public Health, Thesis in Health Promotion Management]. Pathum Thani: Faculty of Public Health, Thammasat University; 2018.
16. Yoottakan P. Health Literacy and Health Promoting Behaviors Among Karen Older Persons. [Master of Nursing Science, Thesis in Gerontological Nursing]. Chiang Mai: Chiang Mai University, 2019.
17. Chesser AK, Keene WN, Smothers K, Rogers N. Health literacy and older adults: A systematic review. Gerontology and geriatric medicine, 2016. DOI:10.1177/2333721416630492
18. Tepthai C, Saowaluk S, Artit C, Issaree P. Factors associated with Health Supplements Product Using Behaviors Among Elderly People. Boromarajonani College of Nursing, Uttaradit Journal 2021; 13(2): 87. (In Thai)