CONSUMER KNOWLEDGE, ATTITUDE, AND PURCHASING BEHAVIOR ON DIETARY SUPPLEMENTS FOR GENERAL HEALTH PURPOSE AMONG YOUNG ADULTS IN THAILAND

BY

MISS SUNHAPORN WONGSAWASDI

AN INDEPENDENT STUDY SUBMITTED IN PARTIAL FULFILLMENT OF
THE REQUIREMENTS FOR THE DEGREE OF
MASTER OF SCIENCE PROGRAM IN MARKETING
(INTERNATIONAL PROGRAM)
FACULTY OF COMMERCE AND ACCOUNTANCY
THAMMASAT UNIVERSITY
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ENTITLED

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Author	Miss Sunhaporn Wongsawasdi
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Independent Study Advisor	Associate Professor James E. Nelson, Ph.D.
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ABSTRACT

The dietary supplements market is growing continuously as a result of hectic city lifestyle. Despite the growing trend, Thai consumers still lack of basic understanding on dietary supplements (Aungtipat et al., 2008). It is interesting to understand the rationale behind these contrasting trends. The objectives of this research are to understand consumer profile, to determine consumer level of knowledge, attitude, and purchasing behavior on dietary supplements.

This study used both exploratory and descriptive research to gain overview of the industry and insights from consumers. Exploratory research included secondary researches, observation, and in-depth interviews. Descriptive research used questionnaire in gathering the data. Qualitative analysis was analyzed by organizing data, looking for patterns, and interpreting the findings. For quantitative analysis, the data were analyzed using Statistical Package for the Social Sciences (SPSS).

The findings of this research found that the most common type of dietary supplements was vitamin C and respondents took it for maintaining in good health. They often purchased supplements from drug stores and they knew about dietary supplements from family and friends. Their knowledge level was at a medium level and they understood the basic level of dietary supplements knowledge such as the purpose, targeted users, and the effectiveness. However, high level of knowledge did

not translate into the high frequency of purchasing of the product, but attitude toward dietary supplements did. The more positive attitude, the more frequent they would likely to purchase dietary supplements, the higher average spending per month, and the higher intention to repurchase dietary supplements again. The respondents would look for the brand that has clear labeling, FDA approval, and reasonable price.

Keywords: Dietary supplements, Knowledge, Attitude towards dietary supplements, Purchasing behavior

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Miss Sunhaporn Wongsawasdi

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CHAPTER 1
INTRODUCTION

1.1 Introduction of the study

In 2015, Thai consumers spent almost 50 billion baht on vitamins and dietary supplements, and this number continued to grow at 11% (Euromonitor International, 2015). This increasing trend of dietary supplements was a reflection of Thai consumers' hectic lifestyle and the increasing of health awareness. Nowadays, in this fast paced environment, people cannot escape from the bustling city lifestyle. They spend most of their time working and commuting, and often times neglecting to take care of their health. Their daily diet and nutrition intake of fast food, high sodium dish, high sugar content, and low carbohydrate meal cannot fulfill their body nutrition requirement. Under these conditions, their health conditions have started to deteriorate. With that, Thai consumers with health-conscious mindset have turned to dietary supplements as an alternative choice to maintain in good health. According to research by Aungtipat et al. (2008), the highest dietary supplement consumption for general health purpose were in the young adults age 20-45 with 91% of the total sample size.

According to Euromonitor International (2015), the overall value of the dietary supplements industry was growing but it was growing at a slower rate. This slower growing rate was partly due to the price war competition among the competing brands aiming to capture the price sensitive consumers. Although, the industry grew slower in 2015, companies still enjoyed the positive growth. Part of the growing value of the market came from the fact that companies were continuously stimulating the demand by introducing new products, vigorously advertising their brand, and offering their products in convenient channels to consumers such as local pharmacy stores, malls, retail shops, convenient stores, and even online channel.

The highly competitive environment and upward consumption trend of dietary supplements still drove the market value to grow continuously. However, according to Aungtipa et al. (2008), Thai consumers still lack of basic knowledge and understanding on health, nutrition and dietary supplements. Often times, this problem caused many consumers to be victims of false advertising and misunderstand the main purpose of

dietary supplements. For companies, the lack of knowledge could translate into a lower purchasing rate of the product.

Despite the lack of knowledge on dietary supplements among Thai consumers, the dietary supplements consumption continued to grow. It is interesting to understand the rationale behind these contrasting trends, their attitude towards dietary supplements, and factors influencing the purchasing decision.

The Food Act of B.E. 2522 (1979) has categorized dietary supplements as a type of food in addition to regular diet providing nutrients for normal people not patients. In today's market, dietary supplements come in various form including tablets, capsules, powder, liquid, etc. The popular type of dietary supplements among Thai consumers are multivitamin, fish oil, calcium and protein supplement (Euromonitor International, 2015).

From this study, companies and marketing professionals can tailor effective marketing strategies for their dietary supplement products as well as have a better understanding of current users of dietary supplements. This research studied in the area of society and the research type is a contemporary topic in applied marketing that aims to explore and understand consumers' knowledge, attitudes and purchasing behavior on dietary supplements for general health purpose among young adults in Thailand.

1.2 Operational Definition of Key Terms

Dietary Supplements: a food product intends to supplement the diet with nutritional value, and it contains active dietary ingredients, either single or a mixture of substances, aiming for normal people not patients.

Knowledge: facts and information acquired by a person through experience and education

Attitude: an overall evaluation from one's thinking or feelings about something that is reflected in their behavior

Purchasing behavior: buying behavior of consumers which reflects from their attitude, knowledge, preferences and intentions to buy when they are at a market place.

1.3 Research objectives

This research studied in the area of society and the research type is a contemporary topic in applied marketing. The first research objective is to understand consumer profile of dietary supplements users by demographics including gender, age, education, occupation, income, and health condition. The second objective is to determine consumer level of knowledge on dietary supplements by determining the minimum knowledge consumer should know before purchasing dietary supplements and testing the level of knowledge about dietary supplements. The third objective is to understand the attitude of consumer towards dietary supplements as well as their satisfaction level on dietary supplements. Lastly, the fourth objective is to explore the usage pattern on dietary supplements and determine factors influencing their purchase decision on dietary supplements.

CHAPTER 2
REVIEW OF LITERATURE

The relevant information about dietary supplements and consumer knowledge, attitude and purchasing behavior from nine literature reviews were summarized. From the literature reviews, dietary supplements are for supplementing to maintain in good health and Thai consumers still lack of knowledge on dietary supplements. However, with the health conscious trend is on its rise, dietary supplements products in Thailand was growing. The sources of literature reviews includes both international and Thai research studies, database, books, and government websites.

The survey of "Dietary Supplement Knowledge, Attitude and Use in a Rural Population" in the United States by Owens (2014) stated that based on the survey conducted with 526 adults, 72% of the respondents prefer dietary supplements over conventional medication to maintain good health. Among the users, over 60% also used the dietary supplements along with their medication and they had low concern over the drug-supplement interaction side effects. For knowledge, Owens based his knowledge testing over the regulations side of the dietary supplements in which the majority of respondents recognized that FDA does not regulate dietary supplements the same way as it does to drugs. With the usage of dietary supplement, vitamin is the most common supplement followed by fish oil, cranberry, melatonin, etc. Most respondents "usually or always trust the labeling of dietary supplements as much as they do to medications" (Owens, 2014, p. 4), plus the ease of purchasing dietary supplements resulting in no professional consultation prior to purchasing. However, the respondents tended to discuss the use of dietary supplements with healthcare providers before receiving medical treatment.

With the "Assessing Patients' Attitudes towards Dietary Supplements as Compared to Non-Prescribed Drugs" with 335 samples in Poland, the results showed that more than half of the respondents did not consider dietary supplements as food in which 40% of them considered dietary supplements as a type of drug (Wierzejska et al., 2014). Majority of the respondents believed that taking dietary supplements help to improve overall health, however, one third of respondents also expected dietary supplement to treat diseases. They believed that the best place to purchase dietary

supplements is pharmacy stores. Lastly, most respondents had stronger believe in non-prescribed medicine than dietary supplements.

The study of "Factors Affecting the Purchasing Decisions of Dietary Supplement Products in Bangkok" with 400 respondents (Sungthong, 2004) concluded that majority of the respondents still lack of the general knowledge on dietary supplements in terms of the main purpose, the target users, and the side effects. The most influential social factor over the buying decision was through referral from friends and family whereas the Thai FDA approval of the product was the main marketing mix factor influencing the buying decision. The most common communication channel of the dietary supplements product to respondents was television and brochures. These respondents generally did not search for dietary supplements information on the internet as the research was conducted in early 2000s when the internet was not widely used by the residents.

The study on "Consumer Usage and Knowledge of Dietary Supplements in the Northeastern of Thailand" showed that 69% of total respondents did not take any supplements and only 14% of the total samples of 416 people took dietary supplements and 42% of them took vitamins for general health purpose (Aungathipat et al., 2008). Before purchasing a product, consumer looked at expiration date, manufacturing date, packaging, place of manufacture and active ingredients respectively. As for the knowledge, the research has concluded that consumers in the Northeastern of Thailand generally lack of knowledge on dietary supplement and often times were victims of false advertising. Around 60% of the total samples received a score of five or below out of 25 on the knowledge test showing the low level of knowledge among the Northeasterners. Therefore, in order to improve general knowledge, government should provide the correct information to the public concerning appropriate nutrition intake, product labeling, benefits, safety and risks of dietary supplements.

According to Euromonitor International (2015), Thailand's vitamins and dietary supplements industry in 2015 had a market value of 49.3 billion Baht with the growth rate of 11% and this industry is expected to reach 70 billion Baht by 2020. Even though, in 2015 this industry was growing, it was growing in a slower rate. The growth was mainly due to the health conscious trend among Thai consumers and strong competition in the market stimulating the demand by expanding distribution channels and starting

the price war aiming to capture the price-sensitive consumers. The industry can be segmented by product's positioning into ten categories namely; general health, bone, heart health, beauty, digestive, eye, memory, joint, immune system and other. The general health segment was the biggest category capturing 51% of the total dietary supplements market in Thailand.

According to *Consumer Behavior* by Hoyer et al. (2013, p. 128-149), attitude is "an overall evaluation that express how much we like or dislike an object, issue, person, or action" (p. 128) in which it is based on cognitions and affection and translate our overall evaluation through our behavior. With high motivation, ability and opportunity to process information, consumers are more likely to form or change attitude and make decisions. For marketers, in order to use cognitive to influence attitude effectively, strong argument with credible source support should be considered. Moreover, with the emotional messages, either positive or negative feelings can affect the change of attitude. Lastly, attitude affects our behavior when consumers have high involvement, high emotional attached and high knowledge.

According to *The New Vitamin Bible* by Mindell (2010, p. 4-17), many people think of vitamin as a type of drug and this perception confuses people. Vitamin is an organic substance that is crucial for our health. Our body cannot build vitamin by ourselves, thus, we need vitamins from food and dietary supplements instead. In fact, we do not need to take dietary supplements if we can eat sufficient amount of all five food groups but most people cannot fulfill this fact. Thus, dietary supplements are needed to maintain good health. All dietary supplements are considered as food regardless of its forms because all of them are the extraction of plants or animal. Our body can absorb vitamin well if taking with food. Each individual needs different dietary supplements based on health condition, age, and lifestyle.

According to the "Dietary Supplements: What you need to know" by the United States Office of Dietary Supplements (2011), there are four main areas of what people need to know before purchasing dietary supplements. The first area that consumer should look at is the label that list all the supplements facts with content and amount of active ingredients per serving. Effectiveness is the second factor that consumer need to understand. Dietary supplements are to support body for adequate amounts of nutrients but it cannot replace variety of food that are important to you. The third element is

safety and risks. Though dietary supplements are beneficial to consumers, it also have adverse effect if use with other supplements or drug. Fourth, consumers should not take dietary supplements to treat health condition that they diagnosed themselves, instead they should consult with health care practitioners before taking dietary supplements.

The U.S. Food and Drug Administration raised an awareness of medications and dietary supplements interaction in the article "Mixing Medications and Dietary Supplements can endanger your health." Often times, consumers take dietary supplements with their medications but they are unaware that by combining medications and dietary supplements could be dangerous to the body. For example, taking aspirin and vitamin E together could increase the potential of internal bleeding. Many consumers still believe that the "natural" dietary supplements such as herbs and herbal extract are safe. In fact, natural products are not always safe if it was taken with medications. In order to prevent the side effects from medications and dietary supplements, consumers should always consult health practitioner before start taking dietary supplements.

With nine literature reviews, the main ideas were summarized. The increasing of health awareness and hectic lifestyle of consumers in Thailand have translated to the growing market of dietary supplements to almost 50 billion baht in 2015 and expected to grow to 70 billion baht by 2020 (Euromonitor International, 2015). Dietary supplement is regarded as food containing organic substances that are crucial for health (Mindell, 2010, p. 4-17). According to United States Office of Dietary Supplements (2011), before purchasing dietary supplements, consumers should look at the labels, understand its effectiveness, aware of safety and risk in taking dietary supplements, and consult with health care practitioners before taking supplements. In addition, consumer should also be aware that dietary supplements could interact with medication and could have side effects. Thus before taking supplements, consumers should consult with physician (U.S. Food and Drug Administration, 2014).

According to Owens (2014, p.4), the most common type of supplement was vitamin and majority of the respondents prefer dietary supplements over conventional medication to maintain in good health. In addition, patients in Poland also believed that taking dietary supplements can help to improve overall health and they usually purchased supplements at pharmacy stores (Wierzejska et al., 2014). In Thailand,

according to Sungthong (2004), family and friends were the most influential person, and the main communication channel was television. Thai consumers usually took vitamin for general health, however, they generally lack of knowledge on dietary supplements (Aungathipat et al., 2008). According to Hoyer et al. (2013, p. 128-149), attitude is how we express like or dislike on objects, issue, or topics, and attitude can be changed with high motivation, affection and emotional messages.

CHAPTER 3
RESEARCH METHODOLOGY

3.1 Research design

The research was conducted using both exploratory and descriptive research methods. This study used both qualitative and quantitative research in gathering the data. For qualitative, the data were gathered from secondary research, in-depth interview and observation. Self-administered questionnaires was employed in collecting data for quantitative research.

3.2 Exploratory research methodology

This exploratory research was conducted to obtain overview information of the dietary supplements market in Thailand as well as to gain insights from current users who purchased dietary supplement in the past three months. The data obtained from exploratory research were used in developing descriptive research. Three types of exploratory research were conducted including the secondary research, observations, and in-depth interview.

The secondary research data were gathered to explore the industry overview of the dietary supplements, consumers' knowledge, attitude and purchasing behavior, underlying problem related to this industry, and general information on dietary supplements. The industry overview was gathered mainly from Euromonitor International (2015) whereas consumers and underlying problem related to the industry information were collected from various research studies by credible institutions. Moreover, the sources for general information on dietary supplements were from credible websites and books on dietary supplements. This overview of dietary supplements gathered set a baseline measurement of knowledge consumers need to know before purchasing supplements and were used to further develop self-administered questionnaires.

Observation was conducted in October 2016 to explore dietary supplement products in terms of the type of supplements, brands, packaging, price and marketing materials provided at local pharmacy stores, Boots and Watson. In addition, the observation aimed to explore the purchasing process of consumers at a pharmacy store in Silom and at a wellness clinic in Prakhanong. Through observation, the unbiased purchasing process was witnessed. Although, there was a limit of not knowing consumers' thinking at the moment, useful information from observing were collected including the purchasing patterns. The results from observation were used to develop questionnaires.

In-depth interviews were conducted to understand the demographics, lifestyles, knowledge, attitude, factor influencing their purchase decision, and usage on dietary supplements of current users. The in-depth interview allowed interviewer to probe deeply in order to understand the rationale behind consumers' thoughts and decision. The results from in-depth interview were expected to produce hypotheses on consumer profile, knowledge, attitudes and purchasing behavior for further test and quantify in the descriptive research (*See Appendix A: In-depth interview question guide).*

3.3 Descriptive research methodology

The descriptive research was carried out in the form of self-administered questionnaires. The questionnaires was formed in order to gain statistical evidence to generalize the findings regarding to consumer profile, knowledge, attitudes, and factor affecting their purchasing behavior on dietary supplements. The consumer profile included questions such as age, gender, occupation, income, etc. For the knowledge based questions, it was in the form of multiple choice with single answer to test the basic knowledge of respondents on dietary supplements. The attitude measuring questions was in the form of Likert scale statements with scale of one to five where one was strongly disagree and five was strongly agree. Lastly, questions regarding to purchasing behavior were in the form of both multiple choice questions with multiple answers and Likert scale statements. The questionnaire did not exceed 15 minutes to complete. (*See Appendix B: Questionnaire).*

3.4 Identification of key research variables

Key independent variables of this study were 1) Consumers' characteristics such as age, income, education, occupation, health condition, etc. 2) Basic knowledge on dietary supplements they should know before purchasing the products. 3) Consumers' attitude towards dietary supplements whether their attitude is positive or negative. 4) Factors influencing consumers' purchasing decision including social influences, marketing stimulations, etc.

The dependent variables of the research was usage pattern of dietary supplements for general health purpose such as usage rate, purchase frequency, product type, brand, purchasing channel, etc. These dependent variables showed the outcome reflecting from the independent variables.

3.5 Target population

This research set target population for qualitative and quantitative research methodology to ensure the unbiased data. The targeted respondents for in-depth interview were both male and female age between 20-45 years old living in Bangkok metropolitan area who purchased dietary supplements during the past three months. The sample size of in-depth interview was seven. In contrast to the in-depth interview, there was no target population set for the observation method as consumers who purchased supplements came into the store by pure chance.

The quantitative target population had the same criteria as respondents from the in-depth interview. The total quota for questionnaires was 150 respondents in which the quota for each age range will also be set. Each age range, 20-29, 30-39, 40-45 was at least 40 respondents to ensure equal distribution of respondents and unbiased results.

3.6 Data collection plan

Seven in-depth interviews were conducted in October and December in 2016. Each in-depth interview took approximately 45 to 60 minutes and was sound recorded for further analysis. The observation was conducted at Boots, Watson stores, a local

pharmacy store in Silom, and a clinic in Prakhanong area observing the dietary supplement products and brands available in the market and consumers purchasing process of dietary supplements in different settings. The observation in Boots and Watson store took around 20-30 minutes whereas at the pharmacy store and the clinic took around one to two hours.

The questionnaire was validated in pilot test before launching. The questionnaire went through a pilot test and was launched during February 8 - February 27, 2017. The total number of respondents of the survey was 155 respondents age 20-45 years old who purchased dietary supplements for general health purposes during the past three months. The questionnaire was distributed through online channel, such as social media and online communities including Pantip, Thai Love Health facebook page, health and fitness online communities, and offline around Silom and Prakhanong area. Convenience and snowball sampling were used for online and offline survey in order to gather enough responds. In addition, at the end of the questionnaire, the respondents were encouraged to share the questionnaire among their friends who purchased dietary supplements during the past three month.

3.7 Data Analysis Plan

3.7.1 Qualitative analysis

The qualitative analysis focused on the insights gathered from in-depth interview and observation. After each in-depth interview and observation, initial conclusion was drawn as a memo to researcher for further analysis. The data from qualitative research were analyzed by, first, organizing the insights into separate sections according to the objectives and simplifying it into an understandable context. Second, from the organized data, researcher looked for patterns in the data. Third, the conclusions was interpreted from the patterns in which the findings were verified to ensure the validity and realistic results. Lastly, the researcher connected all the findings from both in-depth interviews and observation to form hypotheses for quantitative analysis.

3.7.2 Quantitative analysis

The quantitative data collected from self-administered questionnaires were analyzed using Statistical Package for the Social Sciences (SPSS) to show frequency distribution, relationships between variables through cross tabulations, and other statistical analysis as appropriate. The findings from this study showed whether or not there are significant relationships among the independent and dependent variables. For example, using cross tabulations to show the relationship between the knowledge and usage pattern, and using one-way ANOVA test to test the relationship between the attitudes on dietary supplements and spending level. The results from SPSS analysis were displayed in both tables and summarized in text.

CHAPTER 4
RESULTS AND DISCUSSION

4.1 Exploratory research findings

4.1.1 Secondary research findings

In 2015, vitamins and dietary supplements industry in Thailand had a market value of 49.3 billion Baht with the growth rate of 11% and this industry is expected to reach 70 billion Baht by 2020. The general health segment was the biggest category capturing 51% of the total dietary supplements market in Thailand (Euromonitor International, 2015). Consumers believed that taking dietary supplements help to improve overall health (Wierzejska et al., 2014). Dietary supplements are considered as a type of food by Food Act of B.E. 2522 (1979) and it is aim for normal people not patients. Our body can absorb vitamin well if taking with food. Each individual needs different dietary supplements based on health condition, age, and lifestyle (Mindell, 2010, p. 4-17). According to U.S. Food and Drug Administration (2014), Consumers of dietary supplements should be aware of the side effect from taking supplements with other medication as it can have negatively effect on the body.

4.1.2 Observation research findings

The observations were conducted at a pharmacy store in Silom area and at a wellness clinic in Prakhanong area aiming to explore the dietary supplement products available including the type of supplements, brands, packaging, and price, and observing the purchasing process of consumers. The products available at the pharmacy store in Silom area were common dietary supplements including Thai herbal supplements, multivitamin, vitamin C, fish oil, calcium etc. Whereas at a wellness clinic, more specific supplements were available such as probiotics, enzymes, melatonin, CoQ10, etc. The brands of supplements at both location had both domestic brands such as Abhaiherb, Vistra, Mega we care, Hi-Balanz, etc and international brands including Blackmores, Centrum, DHC, Caltrate, VitaHealth, etc. The price for dietary supplements ranged from 200 Baht to 2,500 baht per bottle in which the price of domestic brands was usually lower price than the international brands.

The purchasing process of dietary supplements at the pharmacy store and at a wellness clinic is different. At the pharmacy store, three patterns of purchasing process could be recognized. First, consumers knew exactly what they wanted, and they tended to purchase the product with no hesitation. They usually repurchased the products that they had used and familiar with. Second, the first time buyers who would like to purchase dietary supplements but undecided on the brand and product specifications. This group needed more information of each brand for comparison such as product specification, dosage, brand, and price. Lastly, the third pattern is the impromptu buyers who bought dietary supplements based on the suggestion from the pharmacist. As for the pattern at a clinic, only one pattern is recognized which is the purchase of supplements based on doctor's recommendations. The supplements purchased at wellness clinics were usually more specific and higher in price. Although, the unbiased purchasing processes were witnessed through observation, the limitation of unable to know consumers' thoughts were absent. The in-depth interviews were conducted to further understand consumers in an in-depth level.

4.1.3 In-depth interview findings

The in-depth interviews were conducted during October to December 2016 with the total of seven respondents. The in-depth interview allowed interviewer to probe deeper to understand the rationale behind consumers' thoughts and decision. Six out of seven respondents were female and one was male with the age range between 20-45 years old, and all respondents had at least a bachelor degree with no underlying diseases.

From the in-depth interview, generally respondents had good basic knowledge of dietary supplements in terms of the main purpose and target consumers of dietary supplements. They understand that dietary supplements were only to supplement our body not to replace the food. They also acknowledged that only food they consumed alone might not be sufficient to body's nutrition requirement. Five out of seven understand that dietary supplements helped in maintaining in good health for normal people and not for treating a disease for patients, and regarded dietary supplements as food whereas only two respondents though that dietary supplements were drugs.

As for the attitude, most of the respondents had a positive attitude towards dietary supplements, however, only one viewed supplements toward the negative side.

For the respondents who have a positive attitude towards dietary supplements, they would repurchase the dietary supplements even though they still could not see the effectiveness upon themselves. They believed that dietary supplements would help them in maintaining a good health. In contrary, the respondent with negative attitude toward the dietary supplements believed that being healthy must come from the changing of lifestyle and healthy diet. If she was to eat healthy food and exercise often, she would not need dietary supplements. She was taking the supplements based on the suggestion from a pharmacist.

When purchasing dietary supplements, all respondents looked for the credibility of the brand, expiration date, and the price comparing with other brands. Two of the respondents searched for testimonial and reviews on the internet to ensure the effective result. Majority of the respondent would repurchase the dietary supplements with an average spending of 1,500 Baht per month. Only one respondent 'maybe' repurchase the dietary supplements again. They purchased dietary from drug stores, internet, and multi-level marketing network.

Through this in-depth interview, respondents with good knowledge and positive attitude were likely to repurchase supplements again. For the respondent with lower knowledge on dietary supplement but with good attitude would still continue to repurchase the dietary supplements. For the respondent with lower knowledge and negative attitude, she 'maybe' repurchase the supplements again. From this result, the knowledge, attitude and factors influencing the purchasing decision were to be furthered analyzed through quantitative research.

4.2 Descriptive research findings

The data gathered from questionnaire were analyzed using SPSS (Statistical Package of Social Sciences). The total respondents who purchased dietary supplements during the past three months was 155 with the age between 20-45 years old.

4.2.1 Summary of respondent profile

The total collected respondents through questionnaire was 155 where by 74.20% were female and 25.80% were male with the age ranging from 20-45 years old.

Most respondents have at least a bachelor degree, 86.50%, and they were employee, 50.30%. Moreover, 38.70% of the respondents had an income ranging from 30,001-50,000 Baht per month and most of the respondents did not have any underlying diseases. The frequency and percentage were used to summarize the respondent profile (*See table 4.1*).

Table 4.1 Summary of respondent profile (n=155)

Respondents' Demographic		n	%
Gender			
Male		40	25.80%
Female		115	74.20%
	Total	155	100.00%
Age			
20-29 years old		54	34.80%
30-39 years old		51	32.90%
40-45 years old		50	32.30%
	Total	155	100.00%
Education			
Below Bachelor		21	13.50%
Bachelor's degree		99	63.90%
Master's degree		33	21.30%
Ph.D		2	1.30%
	Total	155	100.00%
Occupation			
Student		13	8.40%
Business owner		34	21.90%
Employee		78	50.30%
Government officials		8	5.30%
Freelance		18	11.60%
Others		4	2.60%
	Total	155	100.10%
Income (Baht/Month)			
Below 15,000		22	14.20%
15,001-30,000		35	22.60%
30,001-50,000		60	38.70%
50,001-70,000		18	11.60%
70,001 & above		20	12.90%
	Total	155	100.00%
Illness			
Yes		22	14.20%
No		133	85.80%
	Total	155	100.00%

4.2.2 Dietary Supplements Information

From the survey, the information about dietary supplements were summarized using frequency and percentage. The dietary supplements information includes types of dietary supplements, reasons of taking dietary supplements, place of purchase and communication channel where they know about dietary supplements.

The most common type of dietary supplements was vitamin C with 17.60% followed by collagen at 10.3% and multivitamin at 9.50%. (*See Appendix C-a: Type of dietary supplements currently taken by respondents (n=155))*. Moreover, the main reasons for taking dietary supplements were for maintaining in good health at 33.20% and prevent chronic diseases in the future at 21.40% (*See Appendix C-b: Reasons for taking dietary supplements*). As for the place of purchase, the channel to purchase dietary supplements were at drug stores at 29.00%, online at 15.80%, and Boots at 14.40%. The respondents seldom buy their dietary supplements at an event (*See Appendix C-c: Dietary supplements purchasing channel*). In addition, the respondents knew about dietary supplements information mostly through their family and friends, website and doctor at 25.50%, 15.50% and 13.40% respectively. The respondents knew about dietary supplements the least is through radio and newspapers (*See Appendix C-d: Source of information about dietary supplements*).

4.2.3 Dietary supplements usage pattern

The usage pattern of dietary supplements were measured with the frequency of taking supplements, the length of taking supplements, frequency of purchasing the dietary supplements, the average spending on dietary supplements per month in Thai baht, and repurchase intention. The data were summarized using frequency and percentage. Majority of the respondents, 73.50% took dietary supplements four to seven times per week, only 1.30% took dietary supplements less than once a week (*See Appendix D-a: Frequency of taking dietary supplements*).

As for the length of taking dietary supplements, 62.58%, of the respondents had been taking dietary supplements for six months or more. Only 2.58% or four respondents had been taking dietary supplements for less than one month (*See Appendix D-b: Length of taking dietary supplements*). Most of the respondents, 33.55%, purchased dietary supplements every month whereas only 10.97% bought dietary supplements once a year (*See Appendix D-c: Frequency of purchasing dietary supplements*). Most respondents, 38.71%, spent around 501-1,000 baht per month on average in purchasing dietary supplements. Only 10.97% spent 2,000 baht or more per month (*See Appendix D-d: Average spending per month on dietary supplements*). With regards to the repurchase intention, 67.70% would purchase dietary supplements again

whereas 32.3% ‘maybe’ repurchase again. None of the respondents chose ‘no’ to this question (*See Appendix D-e: Repurchasing intention on dietary supplements*).

4.2.4 Demographics and usage pattern

The bivariate correlation was conducted to see the correlation between the demographics of respondents and the usage pattern of dietary supplements. The result from correlation analysis is shown in the table 4.2 below.

Table 4.2: Correlation between demographics and usage pattern

Usage pattern	1. Frequency of taking supplements		2. Length of taking supplements		3. Frequency of buying supplements		4. Average spending/month		5. Repurchasing	
	Pearson Correlation	p-value	Pearson Correlation	p-value	Pearson Correlation	p-value	Pearson Correlation	p-value	Pearson Correlation	p-value
Gender	0.05	0.52	0.00	0.96	-0.05	0.51	0.04	0.63	0.09	0.26
Age	-0.03	0.68	0.26	0.00*	-0.25	0.76	0.06	0.47	-0.11	0.16
Education	-0.06	0.44	0.26	0.00*	0.16	0.05*	0.13	0.10	0.02	0.82
Occupation	-0.04	0.60	-0.12	0.14	-0.11	0.19	0.00	0.99	0.11	0.16
Income	-0.02	0.79	0.31	0.00*	0.21	0.01*	0.23	0.00*	-0.07	0.37
Illness	-0.03	0.74	-0.10	0.23	-0.30	0.00*	0.00	0.99	-0.04	0.66

From table 4.2, the result shows that gender and occupation did not have effect on the usage pattern on dietary supplements whereas age, education, income and illness affected the usage pattern. Age of respondents had significant relationship with only the length of taking dietary supplements at p=0.00 in which $p < 0.05$, however, age did not have significant correlation with other variables of the usage pattern. Education also had significant correlation with length of taking supplements and frequency of purchasing dietary supplements with the p-value of 0.00 and 0.05 respectively where $p < 0.05$. Apart from age and education, income also had significant relationship with length of taking supplement at p=0.00, frequency of purchasing dietary supplements at p=0.01, and average spending per month on dietary supplements at p=0.00 where $p < 0.05$. Lastly, illness also had significant correlation with frequency of purchasing dietary supplements with p-value of 0.00 where $p < 0.05$ significant level. The relation strength for all significant relationships mentioned earlier were rather weak as the Pearson correlation ranged between -0.3 to 0.31 indicating the weak relationship.

4.2.5 Knowledge on dietary supplements

The knowledge questions intended to test the general knowledge on dietary supplements in terms of its purpose, aimed target, side effects, and specific knowledge about vitamin D and zinc. Also, a question was asked for respondents to rate the level of knowledge they thought they had on dietary supplements with a scale of one to five. The respondents thought that their knowledge on dietary supplements was at a medium level with the mean of 3.27 and standard deviation of 0.85. Their actual knowledge on dietary supplement was also at the medium level with the mean score of 6.05 out of 11 and standard deviation of 1.97. The knowledge score had been grouped into three groups of low, medium and high in knowledge with the score between 0-4, 5-7 and 8-11 respectively. 71.60% of the respondents fell into the medium level of knowledge group while 20.00% was under the low level of knowledge and 8.40% was in the high level of knowledge group (*See Appendix E-a: Level of knowledge*).

Respondents understood very well that dietary supplements took sometimes to see its effectiveness at 14.30% and understood that dietary supplements aimed for normal people not patients at 12.70%. In contrast, majority of the respondents misunderstood that dietary supplements were safe as it was made from herbs and natural substances at 20.20%. In fact, herbs and natural substances could interact with each other and created side effects upon the users. In addition, most of the respondents at 14.80% ‘did not know’ that dietary supplements could interact with other drugs or supplements if they were taken together (*See Appendix E-b: Frequency of dietary supplements knowledge*).

4.2.5.1 Knowledge and supplements information

Cross tabulations were conducted for further understanding of each knowledge level group and the source of information they received about dietary supplements, their purchasing channel as well as their usage pattern. With the cross tabulation between the level of knowledge groups and source of information, respondents from all knowledge groups often gained information about dietary supplements from family and friends with the highest frequency across three knowledge groups with the frequency of 25.71% for low, 26.43% for medium, and 22.89% for high knowledge group. Moreover, the low knowledge group also learned about dietary supplements from the websites with the frequency of 18.57% which was the same as the medium group. For

the high knowledge level group, apart from family and friends, they also gained information from pharmacist, doctor and websites with the frequency of 14.46%. The respondents from all three groups received dietary supplements information the least from radio and newspaper. Expectedly, the high knowledge group knew about dietary supplements from books more than the low knowledge group with 8.43% comparing to 1.43% for the low knowledge group (*See Appendix E-c: Source of dietary supplements information by knowledge groups*).

By conducting the cross tabulation between knowledge groups with the purchasing channels, drug store was the most common channel where all three knowledge group purchased their dietary supplements with the highest frequency of each group, 30.36% for low knowledge group. 29.70% for the medium group and 28.57% for the high knowledge group. The low knowledge group also purchased dietary supplements from online channel, 17.86% which was the same as the high knowledge group with 19.05%. For the medium knowledge group, they purchased their dietary supplements from Boots store, 16.36%. The channel where they purchased dietary supplements the least was at booth event (*See Appendix E-d: Purchasing channel of dietary supplements by knowledge group*).

4.2.5.2 Knowledge and usage pattern

Three knowledge groups and usage patterns data were analyzed using cross tabulation and chi-square test. By looking at the frequency generated from cross tabulation, majority of the respondents from low, medium and high knowledge groups took dietary supplements four to seven times per week with 87.10%, 68,50% and 74.30% respectively, and they had been taking the supplements for six months or more with 71.00% for low, 59.60% for medium, and 62,90% for high knowledge group. The low, 38.70%, and medium knowledge group, 33.70%, bought their supplements every three months but the high knowledge group, 34.30%, purchased their supplements every month. The respondents from all three groups usually spent around 501-1,000 Baht per month on dietary supplements, 41.90% for low, 34.80% for medium, and 45.70% for high knowledge group, and they would continue purchasing the supplements. However, by looking at the Pearson's Chi-Square value, none of the usage pattern items had p-value less than 0.05 which indicated that the level of knowledge did not affect the usage pattern on dietary supplements (*See Appendix E-e: Cross tabulation*

between knowledge groups and usage pattern). Moreover, the contingency coefficient values ranged between 0.14 to 0.21 indicating a weak association between knowledge groups and usage pattern, and gamma values also indicated a weak association between the knowledge groups and usage pattern where gamma values ranged from -0.11 to 0.27 (*See Appendix E-f: Contingency coefficient and gamma values for knowledge groups and usage pattern).* Thus, the hypothesis that knowledge level affected the frequency of purchasing was rejected.

4.2.6 Attitude towards dietary supplements

The attitude towards dietary supplements were measured using Likert scale of one to five in the aspects of the importance of dietary supplements, safety, the effectiveness, labeling and advertising, value for money, and satisfaction on dietary supplements. Overall, the attitude towards dietary supplements had a mean of 3.58 meaning that the respondents had a good attitudes toward dietary supplements. The respondents believed that dietary supplements could help in improving overall health with the highest means of 3.96 and generally, they were satisfied with the dietary supplements they were taking with a mean of 3.93 as they thought that dietary supplements was effective with the mean of 3.90. However, the respondents believed that dietary supplements in the market were somewhat unreasonably priced with the mean of 3.01 and they were less likely to continue purchasing dietary supplements if they did not see the effectiveness of it with the mean of 2.99 (*See Appendix F-a: Means of attitude towards dietary supplements*).

4.2.6.1 Attitude and Usage pattern

The means of attitude towards dietary supplements and usage pattern were used in cross tabulation to analyze the relationship between these two variables. By looking at the Pearson's Chi-Square test, the attitude towards dietary supplements did not affect either the frequency of taking supplements nor the length of taking supplements as the p-value for both usage patterns were 0.51 and 0.59 respectively in which the p-values were greater than 0.05 significant level. However, there were significant relationships between the attitude and the frequency of purchasing, average spending, and repurchase intention. The attitude significantly affected the frequency of purchasing dietary supplements at p=0.001, the average spending on dietary supplements per month at

p=0.025, and repurchase intention at p=0.01 where p<0.05 (*See Appendix F-b: Cross tabulation between attitude and usage pattern*).

4.2.6.2 Attitude and level of spending

In order to further understand the attitude towards dietary supplements among the different average spending level groups, One-way ANOVA analysis was conducted. The average spending per month on dietary supplements was grouped into three groups of low, moderate and high spender groups. The low spender group spend up to 1,000 baht per month, moderate spender spent anywhere from 1,001 up to 2,000 baht per month, and the high spender spent 2,001 baht or more per month. This analysis helped in understanding the different attitude toward dietary supplements among the three spending groups. The summary of attitude towards dietary supplements for each spender group is shown in the table 4.3 below.

Table 4.3: Summary of attitude towards dietary supplements for spending group*

Attitude	Spending Level							
	Low (n=81)		Moderate (n=39)		High (n=35)			
	Mean	SD	Mean	SD	Mean	SD	F	p-value
1. Dietary supplements help improving an overall health	3.86	0.83	4.00	0.61	4.11	0.63	1.50	0.227
2. Dietary supplement is important to you	3.63	0.80	3.59	0.79	3.71	0.75	0.24	0.784
3. Dietary supplements help preventing future diseases	3.32	1.00	3.82	1.02	3.94	0.80	6.61	0.002*
4. I take supplement as I do not get sufficient nutrition from food	3.69	0.86	3.67	0.77	4.31	0.80	7.93	0.001*
5. Consult with doctor before purchasing	3.69	1.21	4.08	0.84	4.26	0.85	4.13	0.018*
6. Dietary supplement is safe	3.43	0.91	3.51	0.97	3.60	0.85	0.43	0.650
7. I believe in labels of dietary supplements	3.49	0.92	3.51	0.88	3.49	0.89	0.01	0.991
8. I believe in advertising of dietary supplements	3.15	0.99	3.13	1.00	3.00	1.00	0.28	0.756
9. Dietary supplements in the market have reasonable price	2.99	1.01	3.21	0.86	3.06	1.03	0.65	0.523
10. Worth the money	3.41	0.74	3.41	1.04	3.66	0.76	1.22	0.299
11. Will repurchase as I believed it is good	2.98	1.14	3.03	1.35	2.97	1.27	0.03	0.974
12. Supplement is effective	3.88	0.66	3.92	0.74	3.94	0.73	0.13	0.876

Table 4.3: Summary of attitude towards dietary supplements for spending group*

13. Satisfied with supplements	3.89	0.63	3.90	0.82	4.06	0.64	0.79	0.455
14. Will recommend supplements others	3.70	0.86	3.82	0.97	3.97	0.79	1.18	0.311

*Sample size is 155 for all tests

Table 4.3 shows the mean and standard deviation of attitude towards dietary supplements of each spender group as well as showing the F score and the p-value. From the table, most of the attitude towards dietary supplements were not different from the level of spending as the p-value are greater than 0.05 significant level. However, the attitude were significantly different from level of spending in term of the belief in preventing future chronic diseases ($F = 6.61$, $p < 0.002$), the belief of not getting sufficient nutrition from normal diet ($F = 7.93$, $p < 0.001$), and the belief of consulting doctor before purchasing supplements ($F = 4.13$, $p < 0.018$). Thus, the stronger belief in dietary supplements potential in preventing future chronic diseases, supplementing nutrition to body, and consulting doctor before purchasing supplements affect the level of spending on dietary supplements per month (*See Appendix F-c: One-way ANOVA for spending level and attitude*).

4.2.6.3 Factor analysis

In addition, the Exploratory Factors Analysis was conducted to group the attitude variables into several factors. Through the factor analysis, the correlation of all the attributes were correlated (*See Appendix F-d: Correlation matrix of the attitudes*). Moreover, the Kaiser-Meyer-Olkin value for this analysis was meritorious with value of 0.87 meaning that the sampling for this test was adequate (Andale, 2016), and the communalities of all attributes were greater than 0.50 confirming that one variable shared some common variance with other variables (*See Appendix F-e: Communalities of the attitudes*). Through the factor analysis, the total variance explained 67.04% of the variance establishing four factors for the attitude toward dietary supplements (*See Appendix F-f: Total variance explained of the attitudes*). With the reproduced matrix, there were 9.00% nonredundant residuals with absolute values greater than 0.05. From the factor analysis, four patterns were identified as shown in the table 4.4.

Table 4.4: Factor loading for attitude towards dietary supplements

Attitude towards dietary supplements	Factor I	Factor II	Factor III	Factor IV
1. Dietary supplements help improving overall health		.504		-.335
2. Dietary supplement is important to you		.368		
3. Dietary supplements help preventing future diseases		.603		
4. I take supplement as I do not get sufficient nutrition from food		.549		
5. Consult with doctor before purchasing		.585		
6. Dietary supplement is safe			.665	
7. I believe in labels of dietary supplements			.801	
8. I believe in advertising of dietary supplements			.546	-.319
9. Dietary supplements in the market have reasonable price				-.764
10. Worth the money				-.636
11. Will repurchase as I believed it is good				
12. Supplement is effective	.803			
13. Satisfied with supplements	.758			
14. Will recommend supplements to others	.721			

From table 4.4: Factor loading for attitude toward dietary supplements, four factors had been identified. Factor I consisted of three loadings including “Supplement is effective” (0.80), “Satisfied with supplements” (0.76), and “Will recommend supplements to others” (0.72). All the loadings under factor I were consistently high with the value close to one meaning that factor I strongly affected all three variables, and this first factor explained 40.58% of the variance. “Overall satisfaction” was the label for factor I.

Factor II was labeled “Health and Nutrition” because the high loading under this factor included “Dietary supplements help improving overall health (0.50), “Dietary supplements is important to you” (0.37), “Dietary supplements help preventing future diseases” (0.60), “I take supplement as I do not get sufficient nutrition from food” (0.55), and “Consult with doctor before purchasing” (0.59). The small loading on the importance of dietary supplements meant that this components was a weak component in this factor. This factor explained 11.10% of the variance.

Factor III consisted of three loading items, “Dietary supplement is safe” (0.67), “I believe in labels of dietary supplements” (0.80), and “I believe in advertising of dietary supplements” (0.55). All the loadings were related to the information credibility on dietary supplements, thus this factor was labeled “Information credibility beliefs”. The third factor explained 9.42% of the variance. Lastly, the items related to value for

money were loaded into factor IV. There were two items within this factor which were "Dietary supplements in the market have reasonable price" (-0.76) and "Worth the money" (-0.64), and the fourth factor was labeled as "Value for money". This last factor explained 5.95% of the variance. Although the first three factors were positive values, the factor IV, the "Value for money", yield negative values.

Table 4.5: Factor correlation matrix on attitude towards dietary supplements

Factor	Factor I	Factor II	Factor III	Factor IV
Factor I	1.000	.343	.363	-.583
Factor II	.343	1.000	.320	-.310
Factor III	.363	.320	1.000	-.540
Factor IV	-.583	-.310	-.540	1.000

Table 4.5 shows that factor I, II, and III were positively correlated whereas only factor IV was negatively correlated with the rest of the factors. The negative loading of factor IV or "Value for money" was explained with the questions asked in the survey regarding to their attitude towards the market price on dietary supplement and the value for money on their current dietary supplements. Although respondents believed that dietary supplement was good for their health and were satisfied with the supplements, they considered the price of the dietary supplements in the market was not reasonably priced and it was not worth the money.

4.2.7 Purchasing decision on dietary supplements

The purchasing criteria for buying dietary supplements were asked using Likert scale of one to five where one was strongly disagree and five was strongly agree. Table 4.6 shows the data distribution of purchasing criteria on dietary supplements.

Table 4.6: Purchasing decision on dietary supplements

Factors	Strongly disagree	Disagree	Neutral	Agree	Strongly agree	Mean	SD
1. Recommendation from family and friends	2	18	49	58	28	3.60	0.96
2. Recommendation from doctor/pharmacist	8	15	29	64	39	3.71	1.10
3. Review from internet	17	32	50	41	15	3.03	1.14
4. Buy because of seeing advertising	23	33	45	43	11	2.91	1.17
5. Imported brand	33	24	50	36	12	2.80	1.23
6. Domestic brand	24	32	62	32	5	2.76	1.05
7. Clear labeling	3	2	6	56	88	4.45	0.80

Table 4.6: Purchasing decision on dietary supplements

8. FDA approval	6	6	16	39	88	4.27	1.05
9. Good Manufacture Practice	10	9	22	53	61	3.94	1.16
10. Promotion	12	12	59	56	16	3.34	1.03
11. Consider dosage and amount	6	11	46	60	32	3.65	1.01
12. Reasonable price	1	6	19	91	38	4.03	0.76
13. Nice packaging	10	23	71	46	5	3.08	0.91
14. Convenient	6	13	56	58	22	3.50	0.97
15. Maintaining MLM	75	24	33	15	8	2.08	1.25

From table 4.6, the most important purchasing criteria on dietary supplements for respondents was clear labeling with the mean of 4.45 followed by the FDA approval product with the mean of 4.27. Respondents were less likely to purchase dietary supplements to maintain multi-level marketing membership with the lowest mean, 2.08. Moreover, the place of origin was not an important criteria on purchasing dietary supplements since the question asked about purchasing only imported brands had a mean of 2.80 and domestic brands had a mean of 2.76 which were relatively low comparing to other variables. The exploratory factor analysis was carried out to analyze the purchasing decision. However, the result was not meaningful as the KMO value was only 0.68 meaning that the sampling was barely adequate for factor analysis.

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

The objective for this study is to understand consumer's knowledge, attitude and purchasing behavior on dietary supplements among young adults in Thailand. The total number of respondents for this study was 155 respondents who were 20-45 years old and purchased dietary supplements during the past three months. The data were collected through observations, in-depth interviews, and questionnaires, and then analyzed by SPSS program using frequency, cross tabulations, Pearson's Chi-square test, one-way ANOVA, and exploratory factor analysis tools in analyzing the data.

5.1 Conclusion

5.1.1 Respondent profile

This study founded that majority of the respondents from in-depth interview and survey were female age between 20-29 years old. Most of the respondents had at least a bachelor's degree and were working as an employee. Their income ranged between 30,001-50,001 baht per month and did not have any underlying diseases.

5.1.2 Usage pattern on dietary supplements

The study founded that the most common type of dietary supplements was vitamin C following by collagen and multivitamin. Majority of respondents took dietary supplements mainly because of maintaining in good health and preventing future chronic disease. They often purchased dietary supplements through drug stores and online channel. Moreover, they knew about dietary supplements from family and friends and website. The respondents took supplements four to seven days per week and had been taking supplements for six months or more. They purchased dietary supplements every month with an average spending of 501-1,000 baht per month and they would repurchase dietary supplements again.

5.1.3 Knowledge on dietary supplements

The respondents had been summarized into three groups of low, medium, and high based on their level of knowledge on dietary supplements. Medium knowledge level was the largest group among the three and they understood very well that dietary

supplements took sometimes to see the effectiveness and it aimed for normal people. However, more information regarding to the side effects of supplements should be emphasized to consumer as respondents were not well aware of the dietary supplements side effects and the harmfulness if supplements were to be taken together with other drugs or supplements. All three groups of knowledge gained the information from their family and friends as well as from website, and they often purchased supplements at drug store. From the in-depth interview and survey, the level of knowledge did not affect the usage pattern of dietary supplements. The lack of knowledge did not translate into lower purchasing rate, thus the hypothesis that knowledge level affects the purchasing of dietary supplements was rejected.

5.1.4 Attitude towards dietary supplements

Overall the respondents from both in-depth interview and survey had good attitude towards dietary supplements. They believed that dietary supplements help in improving overall health, and they were satisfied with their current supplements. However, they believed that the dietary supplements in the market were unreasonably priced and they would not purchase the supplements again if they could not see the effectiveness upon themselves. The attitude towards dietary supplements affected the usage patterns. The more positive attitude lead to more frequency of purchasing dietary supplements, higher average spending per month, and higher intention to repurchase dietary supplements again. The attitude could be divided into four different factors namely, the overall satisfaction, health and nutrition, information credibility belief, and value for money. Even though the respondents understand well about the supplements and were satisfied with the supplements, they were less likely to purchase dietary supplements if the price of supplement was unreasonable.

5.1.5 Purchasing decision on dietary supplements

The respondents were not strict themselves to only imported brands nor domestic brands. However, when purchasing dietary supplements, the respondents would look for the brand with clear labeling and had FDA approval as well as price at a reasonable price. Pharmacist or doctor were the most influential to the respondents in purchasing dietary supplements. The majority of the respondents were less likely to purchase dietary supplements in order to maintain multi-level marketing membership.

5.2 Recommendations

Companies can focus customer with an age between 30-45 holding at least a bachelor's degree with no underlying illness as they are a group with highest frequency of taking and purchasing dietary supplements. Moreover, positive attitude and satisfaction on dietary supplements lead to higher frequency of purchasing, higher average spending per month, and lastly more repurchase intention. It is wise for dietary supplement companies and marketing professionals to build positive attitude towards dietary supplements and increase satisfaction on the product. They can do this by focusing on creating good quality, effective, and safe product. In term of safety, companies should emphasize on educating consumers regarding to the side effects that comes from the interactions between supplements and drugs, and create awareness of harmful side effects among consumers before taking dietary supplements. Moreover, companies should have clear labeling with expiration and manufactured date as well as ingredients and benefits of the supplements. Dietary supplements companies should distribute their product through drug stores and online as they are the most convenient channels, and apart from communicating about the product to consumers, companies should also focus on communicating the benefits and usage of the product through pharmacists and doctors as they are the most influential personnel.

5.3 Limitations

There were limitations in this research including the small sample size of 155 respondents, sampling method using convenient sampling especially for the in-depth interview and the time constraint in collecting and analyzing the data.

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APPENDICES

APPENDIX A
IN-DEPTH INTERVIEW QUESTION GUIDE

Demographic:

1. Age:
2. Gender: M F
3. Education Level:
4. Occupation
5. Health concerns:

Knowledge:

1. What is dietary supplements?
2. Objective of dietary supplements? Treatment or just supplements?
3. To whom the supplements are mainly for? Regular people or patients in the hospital?
4. Dietary supplements are classified as DRUG or FOOD?

Attitude:

1. Do you consider yourself to be a health-conscious individual?
2. Do you think that supplements are important to you or not?
3. Do you feel that the supplement is effective?
4. Are you satisfied with your supplements?

Usage pattern:

1. Have you taken supplements during the past three months? What did you take?
2. Why did you take the supplements?
3. Where did you purchase supplements?
4. How much do you usually spend on supplements per month?
5. When you are purchasing supplements what do you consider before purchasing dietary supplements?
6. Will you repurchase it again?

APPENDIX B

QUESTIONNAIRE

Section 1: Screening

1. Age (screening question)
   - ☐ Below 20 (Exit)
   - ☐ 20 - 29
   - ☐ 30 -39
   - ☐ 40 - 45
   - ☐ Above 45 (Exit)
2. Are you currently residing in Bangkok?
   - ☐ Yes
   - ☐ No
3. Are you currently taking any dietary supplements? (Screening Question)
   - ☐ Yes (Go to question 6)
   - ☐ No (Exit)
   - ☐ Used to (Exit)

Section 2: Purchasing of Dietary Supplements

4. What dietary supplements product are you currently/used to take? (Check all that apply)
   - ☐ Thai herbs
   - ☐ Spilurina
   - ☐ Evening Primrose Oil (EPO)
   - ☐ Fish oil
   - ☐ Multivitamins
   - ☐ Vitamin C
   - ☐ Vitamin B Complex
   - ☐ Zinc
   - ☐ Iron
   - ☐ Magnesium
   - ☐ Collagen
   - ☐ Calcium
   - ☐ Grape Seed extract
   - ☐ Alpha Lipoic Acid (ALA)
   - ☐ Glutathione
   - ☐ Folic Acid
   - ☐ Melatonin
   - ☐ CO Q10
   - ☐ Probiotics
   - ☐ Digestive enzyme
   - ☐ L-Carnitine
   - ☐ Protein powder
   - ☐ Others (Please specify)
5. Why do you take supplements? (Check all that apply)
   - ☐ Maintaining good health
   - ☐ Weight Loss
   - ☐ Enhance skin
   - ☐ Prevent chronic diseases
   - ☐ Ensure adequate nutrition
   - ☐ Others (Please specify)

6. Where do you purchase your dietary supplements? (check all that apply)

- ☐ Boots
- ☐ Watson
- ☐ Local Pharmacy stores
- ☐ Supplement shops (ie. GNC)
- ☐ Health shops
- ☐ Online websites
- ☐ MLM network
- ☐ Booth event
- ☐ Other (Please specify)

7. Where do you obtain information about dietary supplements? (check all that apply)

- ☐ Newspaper
- ☐ Magazine
- ☐ Pharmacist
- ☐ TV
- ☐ Radio
- ☐ Meeting
- ☐ Family and friends
- ☐ Doctor
- ☐ Books
- ☐ Event booth
- ☐ Websites
- ☐ Social media
- ☐ Other (please specify)

8. How often do you usually take dietary supplements?

- ☐ 4-7 days per week
- ☐ 1-3 days per week
- ☐ Less than 1 day per week
- ☐ No specific time

9. How long have you been taking dietary supplements?

- ☐ Less than 1 month
- ☐ 1-3 months
- ☐ 3-6 months
- ☐ 6 months and above

10. How often do you purchase dietary supplements?

- ☐ Every month
- ☐ Every 3 months
- ☐ Every 6 months
- ☐ Once a year
- ☐ Other (Please specify)

11. How much do you spend on our dietary supplement on average per month?

- ☐ Less than 500
- ☐ 501- 1,000 Baht
- ☐ 1,001-1,500 Baht
- ☐ 1,501- 2,000 Baht
- ☐ More than 2,000 Baht

12. If you run out of supplements, will you continue to buy it again?

☐ Yes ☐ Maybe ☐ No

Section 3: Knowledge

1. Based on your knowledge, how much do you know about dietary supplements?

   Very low 1 2 3 4 5 Very high

2. Based on the FDA regulation, do you think that dietary supplements is considered as drug or food?

   ☐ Drug ☐ Food ☐ Do not know

3. Can dietary supplements treat a disease?

   ☐ Yes ☐ No ☐ Do not know

4. Can dietary supplements help preventing chronic diseases?

   ☐ Yes ☐ No ☐ Do not know

5. Do dietary supplements take sometimes to see its effectiveness

   ☐ Yes ☐ No ☐ Do not know

6. Whom does the dietary supplements mainly aim for?

   ☐ Normal people ☐ Do not know

   ☐ Patient with diseases

7. Dietary supplements are safe as they are made from herbal and natural products

   ☐ Yes ☐ No ☐ Do not know

8. Dietary supplements do not have any side effect

   ☐ Yes ☐ No ☐ Do not know

   ☐ Dietary supplements can interact with other supplements or medication

   ☐ Yes ☐ No ☐ Do not know

9. How long is the dietary supplements normal shelf life?

☐ 1 Year ☐ 3 Years ☐ 5 Years

☐ 2 Years ☐ 4 Years

10. Can vitamin D help in improving your immune system

☐ Yes ☐ No ☐ Do not know

11. Is Zinc a vital mineral for healthy hair

☐ Yes ☐ No ☐ Do not know

Section 4: Attitude & Satisfaction

How much do you agree with the following statements? (1=strongly disagree, 5= strongly agree)

	Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1.	Taking dietary supplements regularly helps you maintaining good health	1	2	3	4	5
2.	Dietary supplements are important to you	1	2	3	4	5
3.	I take supplements to avoid health problems later in life	1	2	3	4	5
4.	I need dietary supplements as I do not receive sufficient amount of food through normal meal	1	2	3	4	5
5.	Dietary supplements should be taken after consultation with healthcare providers	1	2	3	4	5
6.	Dietary supplements in the market are safe	1	2	3	4	5
7.	I trust the labeling on dietary supplements	1	2	3	4	5
8.	I trust dietary supplements advertising claims	1	2	3	4	5
9.	Dietary supplements in the market today has reasonable price	1	2	3	4	5

10. Benefits received from taking dietary supplements worth the money	1	2	3	4	5
11. After taking dietary supplements and still do not see its effectiveness, I will continue to purchase it because it must be beneficial.	1	2	3	4	5
12. I believe that dietary supplements is effective	1	2	3	4	5
13. I am satisfied with dietary supplements I am currently taking.	1	2	3	4	5
14. You will recommend the supplements to others	1	2	3	4	5

Section 5: Factors influencing purchase decision

How much do you agree with the following statements? (1=strongly disagree, 5= strongly agree)

Statements	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
1. I purchase dietary supplements based on family and friends' recommendation	1	2	3	4	5
2. I purchase dietary supplement based on doctor/pharmacist recommendation	1	2	3	4	5
3. I purchase dietary supplements based on testimonials and review on internet	1	2	3	4	5
4. I purchase dietary supplements brands that I see often on advertising	1	2	3	4	5
5. I buy only imported brands	1	2	3	4	5
6. I buy only domestic brands	1	2	3	4	5
7. I always look for clear label brand	1	2	3	4	5
8. I look for FDA approval sign	1	2	3	4	5
9. I look for GMP sign	1	2	3	4	5
10. I purchase dietary supplements because of sales and promotion	1	2	3	4	5

11. Before purchasing, I look at the dosage	1	2	3	4	5
12. I look for reasonable price brand	1	2	3	4	5
13. I choose dietary supplement with nice packaging	1	2	3	4	5
14. I purchase dietary supplements brands that are available in many shops	1	2	3	4	5
15. I buy dietary supplements mainly because of maintaining my membership with MLM network	1	2	3	4	5

Section 6: Demographic

1. Gender
   - ☐ Male
   - ☐ Female
2. Education level
   - ☐ Ph. D.
   - ☐ Master degree
   - ☐ Bachelor's Degree
   - ☐ Below Bachelor's Degree
3. Occupation
   - ☐ Student
   - ☐ Employee
   - ☐ Freelance
   - ☐ Business Owner
   - ☐ Government officials
   - ☐ Other (Please specify)
4. Income per month (THB)
   - ☐ Below 15,000 THB
   - ☐ 15,001 -30,000 THB
   - ☐ 30,001 - 50,000 THB
   - ☐ 50,001 - 70,000 THB
   - ☐ Above 70,001 THB
5. Do you have underlying illness?
   - ☐ Yes (Please specify)
   - ☐ No, I don’t have any illness

APPENDIX C-a

TYPE OF DIETARY SUPPLEMENTS CURRENTLY TAKEN BY RESPONDENTS (N=155)

Type of supplements	n	%
Thai Herb	29	5.86%
Spilurina	16	3.23%
EPO	9	1.82%
Fish Oil	40	8.08%
Multivitamin	47	9.49%
Vitamin C	87	17.58%
Vitamin B complex	21	4.24%
Zinc	16	3.23%
Iron	15	3.03%
Magnesium	7	1.41%
Collagen	51	10.30%
Calcium	33	6.67%
Grapeseed	19	3.84%
ALA	1	0.20%
Glutathione	14	2.83%
Folic acid	9	1.82%
Melatonin	6	1.21%
CoQ10	16	3.23%
Probiotics	7	1.41%
digestive enzymes	3	0.61%
L-Carnitine	16	3.23%
Whey Protein	26	5.25%
Others (Vitamin E, Chinese herbs)	7	1.41%
Total	495	100.00%

APPENDIX C-b

REASONS FOR TAKING DIETARY SUPPLEMENTS

Reasons of taking supplements	n	%
Maintaining in good health	124	33.24%
Weight loss	25	6.70%
Skin	74	19.84%
Prevent future chronic diseases	80	21.45%
Enough nutrition	64	17.16%
Others (Body building, bone)	6	1.61%
Total	373	100.00%

APPENDIX C-c
DIETARY SUPPLEMENTS PURCHASING CHANNEL

Dietary supplements purchasing channel	n	%
Boots	41	14.40%
Watson	38	13.40%
Drug store	84	29.60%
Supplement store	15	5.30%
Health shop	17	6.00%
Online	45	15.80%
MLM	25	8.80%
Booth Event	5	1.80%
Others	14	4.90%
Total	284	100.00%

APPENDIX C-d
SOURCE OF INFORMATION ABOUT DIETARY SUPPLEMENTS

Source of information	n	%
Newspaper	5	1.32%
Magazine	28	7.37%
Pharmacist	37	9.74%
TV	18	4.74%
Radio	4	1.05%
Meeting	9	2.37%
Family and friends	97	25.53%
Doctor	51	13.42%
Books	23	6.05%
Booth Event	15	3.95%
Website	59	15.53%
Social Media	34	8.95%
Total	380	100.00%

APPENDIX D-a
FREQUENCY OF TAKING DIETARY SUPPLEMENTS

Frequency of taking supplements	n	%
4-7days/week	114	73.55%
1-3days/week	23	14.84%
Less than 1 day/week	2	1.29%
Take only when they can remember	16	10.32%
Total	155	100.00%

APPENDIX D-b
LENGTH OF TAKING DIETARY SUPPLEMENTS

Length of taking dietary supplements	n	%
Less than 1 month	4	2.58%
1-3months	30	19.35%
3-6months	24	15.48%
6 months & Over	97	62.58%
Total	155	100.00%

APPENDIX D-c
FREQUENCY OF PURCHASING DIETARY SUPPLEMENTS

Frequency of buying supplements	n	%
Every month	52	33.55%
Every 3 month	49	31.61%
Every 6 month	26	16.77%
Once a year	17	10.97%
Others	11	7.10%
Total	155	100.00%

APPENDIX D-d
AVERAGE SPENDING PER MONTH ON DIETARY SUPPLEMENTS

Average spending per month	n	%
Less than 500 Baht/month	21	13.55%
501-1,000 baht	60	38.71%
1,001-1,500 baht	39	25.16%
1,501-2,000 baht	18	11.61%
2,000 baht &above	17	10.97%
Total	155	100.00%

APPENDIX D-e
REPURCHASING INTENTION ON DIETARY SUPPLEMENTS (N=155)

Repurchasing of dietary supplements	n	%
Buy	105	67.70%
Maybe	50	32.30%
	155	100.00%

APPENDIX E-a
LEVEL OF KNOWLEDGE

Level of knowledge	n	%
Low (0-4)	31	20.00%
Medium (5-8)	111	71.60%
High (9-11)	13	8.40%
	155	100.00%

APPENDIX E-b
FREQUENCY OF DIETARY SUPPLEMENTS KNOWLEDGE

Frequency of dietary supplements knowledge	Correct		Wrong		Do not Know	
	n	%	n	%	n	%
1. Dietary supplements is considered as food not drug	79	8.40%	42	9.30%	34	10.90%
2. Supplements cannot treat a disease	116	12.40%	27	6.00%	12	3.90%
3. Supplements can prevent chronic disease	72	7.70%	63	14.00%	20	6.40%
4. Supplements takes sometimes to take effects	134	14.30%	12	2.70%	9	2.90%
5. Supplements aim for normal people not patients	119	12.70%	18	4.00%	18	5.80%
6. Dietary supplements are not 100% safe even though it is made from herbs and natural substance	23	2.50%	91	20.20%	41	13.20%
7. Dietary supplements have side effects	71	7.60%	60	13.30%	24	7.70%
8. Supplements can interact with drug or other supplements	68	7.30%	41	9.10%	46	14.80%
9. Normal shelf life of supplements is 2 years	81	8.60%	36	8.00%	32	10.30%
10. Vitamin D can help improving immune system	71	7.60%	50	11.10%	34	10.90%
11. Zinc is important for healthy hair	103	11.00%	11	2.40%	41	13.20%
	937	**100%**	**451**	**100%**	**311**	**100%**

APPENDIX E-c
SOURCE OF DIETARY SUPPLEMENTS INFORMATION BY KNOWLEDGE GROUPS

Source of information	Knowledge Level					
	Low		Medium		High	
Newspaper	0	0.00%	4	1.76%	1	1.20%
Magazine	5	7.14%	20	8.81%	3	3.61%
Pharmacist	6	8.57%	19	8.37%	12	14.46%
TV	3	4.29%	10	4.41%	5	6.02%
Radio	0	0.00%	4	1.76%	0	0.00%
Meeting	2	2.86%	5	2.20%	2	2.41%
Family and friends	18	25.71%	60	26.43%	19	22.89%
Doctor	11	15.71%	28	12.33%	12	14.46%
Books	1	1.43%	15	6.61%	7	8.43%
Booth Event	5	7.14%	10	4.41%	0	0.00%
Website	13	18.57%	34	14.98%	12	14.46%
Social Media	6	8.57%	18	7.93%	10	12.05%
	70	**100.00%**	**227**	**100.00%**	**83**	**100.00%**

APPENDIX E-d
PURCHASING CHANNEL OF DIETARY SUPPLEMENTS BY KNOWLEDGE GROUP

Place of purchasing dietary supplements	Knowledge Level					
	Low		Medium		High	
Boots	7	12.50%	27	16.36%	7	11.11%
Watson	9	16.07%	23	13.94%	6	9.52%
Drug store	17	30.36%	49	29.70%	18	28.57%
Supplement store	2	3.57%	7	4.24%	6	9.52%
Health shop	3	5.36%	11	6.67%	3	4.76%
Online	10	17.86%	23	13.94%	12	19.05%
MLM	3	5.36%	14	8.48%	8	12.70%
Booth Event	0	0.00%	3	1.82%	2	3.17%
Others	5	8.93%	8	4.85%	1	1.59%
	56	**100.00%**	**165**	**100.00%**	**63**	**100.00%**

APPENDIX E-e

CROSS TABULATION BETWEEN KNOWLEDGE GROUPS AND USAGE PATTERN

1. Frequency of taking supplements	Knowledge Level			X^2	df	p-value
	Low	Medium	High			
4-7days/week	27	61	26	7.054	6	0.316
	87.10%	68.50%	74.30%			
1-3days/week	1	18	4			
	3.20%	20.20%	11.40%			
Less than 1 day/week	0	1	1			
	0%	1.10%	2.90%			
Take whenever	3	9	4			
	9.70%	10.10%	11.40%			

2. Length of taking supplements	Knowledge Level			X^2	df	p-value
	Low	Medium	High			
Less than 1 month	1	2	1	2.971	6	0.813
	3.20%	2.20%	2.90%			
1-3months	3	19	8			
	9.70%	21.30%	22.90%			
3-6months	5	15	4			
	16.10%	16.90%	11.40%			
6 months & Over	22	53	22			
	71.00%	59.60%	62.90%			

3. Frequency of buying supplements	Knowledge Level			X^2	df	p-value
	Low	Medium	High			
Every month	11	29	12	6.196	8	0.625
	35.50%	32.60%	34.30%			
Every 3 month	12	30	7			
	38.70%	33.70%	20.00%			
Every 6 month	3	17	6			
	9.70%	19.10%	17.10%			
Once a year	3	8	6			
	9.70%	9.00%	17.10%			
Others	2	5	4			
	6.50%	5.60%	11.40%			

4. Average spending/month	Knowledge Level			X^2	df	p-value
	Low	Medium	High			
Less than 500 Baht/month	4	12	5	6.709	8	0.568
	12.90%	13.50%	14.30%			
501-1,000 baht	13	31	16			
	41.90%	34.80%	45.70%			
1,001-1,500 baht	5	28	6			
	16.10%	31.50%	17.10%			
1,501-2,000 baht	6	9	3			
	19.40%	10.10%	8.60%			

2,000 baht &above	3 9.70%	9 10.10%	5 14.30%			

5. Repurchasing	Knowledge Level			X^2	df	p-value
	Low	Medium	High			
Yes	24 77.40%	61 68.50%	20 57.10%	3.154	2	0.207
Maybe	7 22.60%	28 31.50%	15 42.90%			

APPENDIX E-f
CONTINGENCY COEFFICIENT AND GAMMA VALUES FOR KNOWLEDGE GROUPS AND USAGE PATTERN

Knowledge level and usage pattern	Contingency coefficient	Gamma
1. Frequency of taking supplements	0.209	0.161
2. Length of taking supplements	0.137	-0.109
3. Frequency of buying supplements	0.196	0.118
4. Average spending/month	0.204	-0.044
5. Repurchasing	0.141	0.267

APPENDIX F-a
MEANS OF ATTITUDE TOWARDS DIETARY SUPPLEMENTS

Attitude	Mean	Standard Deviation
1. Dietary supplements help improving overall health	3.955	0.742
2. Dietary supplement is important to you	3.639	0.780
3. Dietary supplements help preventing future diseases	3.587	0.999
4. I take dietary supplement as I could not get sufficient nutrition from food	3.826	0.862
5. I consult with doctor before purchasing	3.916	1.075
6. Dietary supplement is safe	3.490	0.907
7. I believe in labels of dietary supplements	3.497	0.900
8. I believe in advertising of dietary supplements	3.110	0.991

9, Dietary supplements in the market have reasonable price	3.058	0.975
10. Dietary supplement is worth the money	3.465	0.832
11. I will continue to buy supplements even though I do not see the effectiveness but I believe it is good	2.987	1.217
12. Dietary supplement is effective	3.903	0.691
13. I am satisfied with dietary supplements I am currently taking	3.929	0.685
14. I will recommend dietary supplements to others	3.794	0.873
Overall	**3.582**	**0.555**

APPENDIX F-b
CROSS TABULATION BETWEEN ATTITUDE AND USAGE PATTERN

1. Frequency of taking supplements	**Attitude and satisfaction level**						
	Low	**Medium**	**High**	**Very High**	**X^2**	**df**	**p-value**
4-7days/week	3	31	68	12	8.22	9.00	0.510
	75.00%	60.80%	81.00%	75.00%			
1-3days/week	1	11	8	3			
	25.00%	21.60%	9.50%	18.80%			
Less than 1 day/week	0	1	1	0			
	0.00%	2.00%	1.20%	0.00%			
When possible	0	8	7	1			
	0.00%	15.70%	8.30%	6.30%			

2. Length of taking supplements	**Attitude and satisfaction level**						
	Low	**Medium**	**High**	**Very High**	**X^2**	**df**	**p-value**
Less than 1 month	0	3	1	0	7.45	9.00	0.590
	0.00%	5.90%	1.20%	0.00%			
1-3 months	2	11	15	2			
	50.00%	21.60%	17.90%	12.50%			
3-6months	0	8	14	2			
	0.00%	15.70%	16.70%	12.50%			
6 months & Over	2	29	54	12			
	50.00%	56.90%	64.30%	75.00%			

3. Frequency of buying supplements	Attitude and satisfaction level				X^2	df	p-value
	Low	Medium	High	Very High			
Every month	0	17	33	2	33.584	12	.001*
	0.00%	33.30%	39.30%	12.50%			
Every 3 month	0	16	27	6			
	0.00%	31.40%	32.10%	37.50%			
Every 6 month	4	9	8	5			
	100.00%	17.60%	9.50%	31.30%			
Once a year	0	7	10	0			
	0.00%	13.70%	11.90%	0.00%			
Others	0	2	6	3			
	0.00%	3.90%	7.10%	18.80%			

4. Average spending/month	Attitude and satisfaction level				X^2	df	p-value
	Low	Medium	High	Very High			
Less than 500 Baht/month	3	9	8	1	23.31	12.00	.025*
	75.00%	17.60%	9.50%	6.30%			
501-1,000 baht	1	19	36	4			
	25.00%	37.30%	42.90%	25.00%			
1,001-1,500 baht	0	14	18	7			
	0.00%	27.50%	21.40%	43.80%			
1,501-2,000 baht	0	6	9	3			
	0.00%	11.80%	10.70%	18.80%			
2,000 baht &above	0	3	13	1			
	0.00%	5.90%	15.50%	6.30%			

5. Repurchasing	Attitude and satisfaction level				X^2	df	p-value
	Low	Medium	High	Very High			
Yes	1	33	55	16	11.38	3.00	0.010*
	25.00%	64.70%	65.50%	100.00%			
Maybe	3	18	29	0			
	75.00%	35.30%	34.50%	0.00%			

APPENDIX F-c
ONE-WAY ANOVA RESULT FOR SPENDING LEVEL AND ATTITUDE

ANOVA

		Sum of Squares	df	Mean Square	F	Sig.
1. Dietary supplements help improving overall health	Between Groups	1.635	2	0.817	1.496	0.227
	Within Groups	83.049	152	0.546		
	Total	84.684	154			
2. Dietary supplement is important to you	Between Groups	0.300	2	0.150	0.244	0.784
	Within Groups	93.468	152	0.615		
	Total	93.768	154			
3. Dietary supplements help preventing future diseases	Between Groups	12.291	2	6.145	6.611	0.002*
	Within Groups	141.284	152	0.929		
	Total	153.574	154			
4. I take supplement as I do not get sufficient nutrition from food	Between Groups	10.803	2	5.402	7.933	0.001*
	Within Groups	103.493	152	0.681		
	Total	114.297	154			
5. Consult with doctor before purchasing	Between Groups	9.171	2	4.585	4.131	0.018*
	Within Groups	168.739	152	1.110		
	Total	177.910	154			
6. Dietary supplement is safe	Between Groups	0.715	2	0.358	0.431	0.650
	Within Groups	126.020	152	0.829		
	Total	126.735	154			
7. I believe in labels of dietary supplements	Between Groups	0.015	2	0.008	0.009	0.991
	Within Groups	124.733	152	0.821		
	Total	124.748	154			
8. I believe in advertising of dietary supplements	Between Groups	0.554	2	0.277	0.280	0.756
	Within Groups	150.581	152	0.991		
	Total	151.135	154			
9. Dietary supplements in the market have reasonable price	Between Groups	1.245	2	0.623	0.652	0.523
	Within Groups	145.232	152	0.955		
	Total	146.477	154			
10. Worth the money	Between Groups	1.678	2	0.839	1.216	0.299
	Within Groups	104.877	152	0.690		
	Total	106.555	154			
11. Will repurchase as I believed it is good	Between Groups	0.078	2	0.039	0.026	0.974
	Within Groups	227.896	152	1.499		
	Total	227.974	154			
12. Supplement is effective	Between Groups	0.128	2	0.064	0.133	0.876
	Within Groups	73.420	152	0.483		
	Total	73.548	154			

13. Satisfied with supplements	Between Groups	0.744	2	0.372	0.791	0.455
	Within Groups	71.475	152	0.470		
	Total	72.219	154			
14. Will recommend supplements to others	Between Groups	1.790	2	0.895	1.177	0.311
	Within Groups	115.604	152	0.761		
	Total	117.394	154			

APPENDIX F-d
CORRELATION MATRIX OF THE ATTITUDE

Correlation Matrix[a]

		1. Improving	2. Important	3. Help prev	4. I take sup	5. Consult w	6. Dietary su	7. I believe i
Correlation	1. Improving overall health	1.000	.645	.439	.343	.289	.313	.306
	2. Important to you	.645	1.000	.324	.350	.273	.426	.461
	3. Help preventing future diseases	.439	.324	1.000	.316	.324	.139	.172
	4. I take supplement as I do not get sufficient nutrition from food	.343	.350	.316	1.000	.412	.243	.271
	5. Consult with doctor before purchasing	.289	.273	.324	.412	1.000	.222	.198
	6. Dietary supplement is safe	.313	.426	.139	.243	.222	1.000	.622
	7. I believe in labels	.306	.461	.172	.271	.198	.622	1.000
	8. I believe in advertising	.334	.438	.079	.167	.094	.518	.609
	9, Dietary supplements in the market have reasonable price	.417	.429	.145	.198	.203	.401	.455
	10. Worth the money	.466	.480	.193	.159	.116	.359	.401
	11. Will repurchase as I believed it is good	.410	.358	.359	.171	.178	.300	.320
	12. Effective	.435	.453	.299	.146	.094	.345	.381
	13. Satisfied with supplements	.403	.426	.156	.210	.089	.328	.310
	14. Recommend to others	.447	.509	.237	.185	.141	.301	.313

a. Determinant = .002

		8. I believe i	9, Dietary su	10. Worth th	11. Will repu	12. Effective	13. Satisfied	14. Recomm
Correlation	1. Improving overall health	.334	.417	.466	.410	.435	.403	.447
	2. Important to you	.438	.429	.480	.358	.453	.426	.509
	3. Help preventing future diseases	.079	.145	.193	.359	.299	.156	.237
	4. I take supplement as I do not get sufficient nutrition from food	.167	.198	.159	.171	.146	.210	.185
	5. Consult with doctor before purchasing	.094	.203	.116	.178	.094	.089	.141
	6. Dietary supplement is safe	.518	.401	.359	.300	.345	.328	.301
	7. I believe in labels	.609	.455	.401	.320	.381	.310	.313
	8. I believe in advertising	1.000	.558	.442	.378	.338	.423	.364
	9, Dietary supplements in the market have reasonable price	.558	1.000	.615	.340	.384	.376	.334
	10. Worth the money	.442	.615	1.000	.378	.474	.571	.482
	11. Will repurchase as I believed it is good	.378	.340	.378	1.000	.446	.318	.395
	12. Effective	.338	.384	.474	.446	1.000	.671	.602
	13. Satisfied with supplements	.423	.376	.571	.318	.671	1.000	.638
	14. Recommend to others	.364	.334	.482	.395	.602	.638	1.000

a. Determinant = .002

APPENDIX F-e
COMMUNALITIES OF THE ATTITUDE

Communalities

	Initial	Extraction
1. Improving overall health	.533	.601
2. Important to you	.554	.551
3. Help preventing future diseases	.322	.401
4. I take supplement as I do not get sufficient nutrition from food	.287	.342
5. Consult with doctor before purchasing	.254	.339
6. Dietary supplement is safe	.447	.539
7. I believe in labels	.546	.714
8. I believe in advertising	.548	.601
9, Dietary supplements in the market have reasonable price	.513	.649
10. Worth the money	.552	.633
11. Will repurchase as I believed it is good	.348	.314
12. Effective	.587	.667
13. Satisfied with supplements	.622	.654
14. Recommend to others	.520	.593

APPENDIX F-f
TOTAL VARIANCE EXPLAINED OF THE ATTITUDE

Total Variance Explained

	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings[a]
Factor	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total
1	5.681	40.580	40.580	5.262	37.588	37.588	3.867
2	1.554	11.097	51.677	.999	7.136	44.725	2.565
3	1.318	9.415	61.092	.926	6.613	51.338	3.140
4	.833	5.947	67.039	.409	2.921	54.259	3.692
5	.778	5.555	72.594				
6	.660	4.717	77.310				
7	.576	4.116	81.426				
8	.543	3.876	85.302				
9	.444	3.169	88.472				
10	.389	2.780	91.252				
11	.380	2.715	93.967				
12	.344	2.457	96.423				
13	.296	2.117	98.540				
14	.204	1.460	100.000				

Extraction Method: Principal Axis Factoring.

a. When factors are correlated, sums of squared loadings cannot be added to obtain a total variance.

BIOGRAPHY

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