

Received: May 2023 Accepted: June 2023 DOI:
<https://doi.org/10.58262/ks.v11i02.138>

A Comparison of Food Selection Behaviors with Ages Range of the Elderly in Thailand

Mayuree Ruengsombat^{1*}, Yanin Rugwongwan²

Abstract

As individuals age, elderly people experience physical deterioration. Consequently, preparing adequate support for the elderly population poses a challenge, particularly in understanding their food consumption behavior and age patterns. Therefore, exploring the needs of Thai elderly individuals in terms of food containers is regarded as an initial step towards developing appropriate solutions. The elderly population possesses significant influence and substantial purchasing power. As a result, there exists an opportunity to develop a Niche Market that caters to their specific needs, which holds the potential to become a sizable market in the future. The question for this research is: What types of food consumption behaviors do Thai elderly people have? The aims for this research is to study about: 1) Personal characteristics and savory food consumption behavior of Thai elderly. 2) Comparison of savory food consumption behavior with age range of Thai elderly. The research hypothesis is that various characteristics among Thai elderly individuals influence their food consumption behavior. This is a quantitative research; the informants were elderly aged between 60-79 years living in Bangkok. The top 3 districts with the highest number of elderly people were, Lat Krabang, Saphan Sung and Min Buri. The informants, comprising a sample size of 120 individuals, participated on a voluntary basis. Among the participants, there were 56 males and 64 females. They were categorized into 2 age groups: 60-69 years, consisting of 60 individuals, and 70-79 years, also comprising 60 individuals. In all 3 districts, there are happiness centers catering to individuals of all age groups. The researchers were granted permission to conduct field studies in order to collect data. A questionnaire was utilized as the data collection instrument. The collected data was analyzed by examining the consumption behavior of savory food in relation to the age of elderly individuals in Thailand. MANOVA (Multivariate Analysis of Variance) was used for testing purposes. The subsequent results indicated that, there was no significant difference in the behavior of savory food consumption based on the gender and age range of Thai elderly participant in the statistical analysis. When considering the average results, males showed a higher preference for savory food, particularly boiled and curry dishes, compared to females. This trend was especially evident among the age range of 70 - 79 years old, where participants tended to choose food according their personal preferences and familiarity with certain dishes. This can be concluded that, neither gender nor age range significantly affected the food consumption behavior of Thai elderly participants. The choice of food remained consistent across genders and age groups, these factors did not play a crucial role in influencing food choices among the Thai elderly population.

Keywords: Behavioral, Food Consumption, Age Range, The Elderly.

Introduction

Food is an important factor for the overall growth of the body, including mental and repair functions, especially in the elderly. This is because as you age, your body undergoes natural deterioration and experiences changes that vary in speed depending on factors such as heredity, nutrition, lifestyle, diseases, and the environment.

¹Ph.D. Student, Multidisciplinary Design Research, School of Architecture, Arts, and Design, King Mongkut's Institute of Technology Ladkrabang. Email: mayuree.r@rmutp.ac.th

²Thesis Advisor, Multidisciplinary Design Research, School of Architecture, Arts, and Design, King Mongkut's Institute of Technology Ladkrabang. Email: yanin.ru@kmitl.ac.th

of life, both the elderly themselves and their close companions should prioritize proper nutrition. It is important for the elderly to consume a diverse range of foods that provide essential nutrients from the five food groups. These food groups include: Proteins, Carbohydrates, Salts and Minerals, Vitamins, Fats (Banloo, 2020).

Thai food is unique and characterized by meticulous cooking methods and mellow flavors. The type of food is divided into 2 categories which are: savory food and sweet food. The savory food will have all flavors, sour, sweet, spicy and salty. The cooking methods that are commonly used today are boiled and curry, including: Tom Jued, Tom Yam, Tom Klong, Tom Som, Kang Ped, Kang Khua and Kang Som, etc. Which will put meat and vegetables according to the characteristics of each type of curry. Stir-fried can be separated into 2 types, which are Plain stir-fry and Spicy stir-fry. Stir-frying uses all kinds of vegetables and meat such as, *Stir-fried* with fresh chilies, dried chilies, also may be some curry paste stir-fried, such as Panang Kai, Catfish, Pad Ped, etc. *Steaming* is the use of heat from steam to cook foods such as, steamed fish, steamed chicken, etc. *Frying* is a method of cooking food with oil or other fats, including, fried pork, fried fish, fried shrimp (Official Statistics Registration System, 2016)

Roasted and Grilled, is to cook by placing over the fire, such as roast pork, roast chicken, grilled fish and grilled shrimp. *Yum* is comparable to vegetable salad, with strong flavor. Thai-style salad can be divided into 4 flavors which are: Sweet, Sour, Salty and Spicy. For example, Yum Toa Plu, Yum Hua Pli, Yum Roum, etc.

Dipping and Side Dishes, which is a food that Thai people like to eat, such as mackerel chili paste, grilled fish chili paste, simmers, etc. Dipping sauces are often eaten with various vegetables to help increase the deliciousness and mellowness of various food dishes even more (The Secretariat of the House of Representatives Elderly and Social Development, 1991).

Nowadays, technology has been developed progressively, especially in the fields of medicine and public health, make the Thai elderly population live longer increasingly. It was found that in B.E.2562, Thailand had a population aged 60 years and over, up to 11.6 million people, representing 17.5% of the total population, from the Thai Population Projection Report B.E.2553-2583 (revised version). In B.E. 2565, Thailand became a fully aging society as the proportion of the population aged 60 years and over reached 20%. By B.E. 2576, Thailand is projected to become the ultimate aging society (Banloo, 2018).

When the proportion of the population aged 60 years and over rose to 28%, the population aged 65 years and over increased by 20%. Currently, in B.E. 2582, the average lifespan of Thai people is approximately 76 years. Furthermore, it is expected that within the next 20 years, the average life expectancy of Thai people will increase to 79 years. And the elderly population can be categorized into 3 age groups which are: 1) Early age: 60-69 years old, consisting of 7 million people, accounting for approximately 60.4% of all elderly individuals. 2) Middle age: 70-79 years old, comprising 3.3 million people, representing approximately 28.0% of all elderly individuals. 3) Late age: 80 years and over, with a population of 1.3 million people, accounting for around 11.6% of all elderly individuals (Banloo, 2019; Prawase, 2000). Thailand is classified as a developing country, with Bangkok serving as the capital and exhibiting a single growth style known as Ek Nakhon (Culture Sports and Tourism Department. Youth Centre. (Accessed May 19 & <http://www.bangkok.go.th/cstd>).

This means that Bangkok acts as the center of the country's wealth, attracting opportunities for a better livelihood and reflecting the growth of a centralized economy. Moreover, there is a focus on developing Bangkok more than other areas, leading to a large population in the city, which contributes to its status as Ek Nakhon. As a result, Bangkok has the highest density of elderly people in Thailand. According to statistics from 2016, the number of elderly individuals in Bangkok was 978,455, accounting for approximately 17.22% of the total elderly population (Official Statistics. In order for the elderly to have a good quality of life, both the elderly themselves and their close companions should prioritize proper nutrition. Registration System, 2016).

The eastern part of Bangkok has transformed into an agricultural area, as well as a residential and commercial hub with various connecting routes. Additionally, it has become a center for creating happiness and well-being for people of all ages, as reported by The Culture and Youth Centre. In the areas of Ladkrabang, Saphan Sung, and Minburi within Bangkok, there are recreational services and activities provided within the centers for the elderly to engage in social interactions with each other. These areas were used as a case study for such activities, as reported by (Official Statistics Registration System, 2016).

Based on the above reasons, this aging study aims to compare the food consumption behavior with the age of the elderly in Thailand. By concentrating on the study of the elderly in two age groups - the early age group of 60-69 years old and the middle age group of 70-79 years old - the researcher chose not to study the late age group of 80 years old over, as they require assistance in performing their daily activities.

Research questions is: What types of food consumption behaviors do Thai elderly people have? The research hypothesis is that various characteristics among Thai elderly individuals influence their food consumption behavior. Hence, this study serves as a guideline for marketing planning and meeting the needs of the elderly in order to create a niche market, which has the potential to grow and cater specifically to their needs (Vilai, 2018).

Research Questions

What types of food consumption behaviors do Thai elderly have?

Research Objectives

1. To study the personal characteristics and food consumption behavior of the Thai elderly.
- 2 To study the comparison of food consumption behavior with age and the gender of the Thai elderly.

Research hypothesis

Various characteristics among Thai elderly individuals have been found to influence their food consumption behavior (Perec, 2022; Yela, Faber, Dantas, Benetti-pinto, & Jales, 2022).

Research Exploitation

The results of this study were used as a guideline for the selection of savory food to lead the food container design process for Thai elderly individuals, as well as nutrition planning specifically tailored for the elderly population in Thailand. These efforts are aimed at targeting consumers in a Niche Market, which is expected to grow into a larger market in the future (Sirimon, 2010).

Literature Review

This research article discusses several theories related to the study as follows:

Food consumption behavior is shaped by habits and familiarity with regular consumption patterns that have been accumulated since childhood. These behaviors are refined by various factors in the surrounding environment during childhood and adulthood. Consumption behavior is not innate but rather learned through imitation from family and the environment. Therefore, it is subject to change (Cohen, Brownell, & Felix, 1990). Consumer behavior refers to the actions and choices made by individuals in acquiring, selecting, and consuming food. It encompasses choices related to food preferences, cooking, and preparation practices. It also includes verbal and non-verbal expressions that influence decision-making processes (Phitsanu, 2017). and consuming food. It encompasses choices related to food preferences, cooking, and preparation

practices. It also includes verbal and non-verbal expressions that influence decision-making processes (Phitsanu, 2017). The term "elderly" refers to individuals who are considered old or advanced in age. In Thailand, the criteria for categorizing someone as elderly is based on their age, typically defined as being over sixty years old and holding Thai nationality, according to the Elderly Act B.E. 2546,

Section 3. The aging process is often associated with a decline in health and reduced resistance to diseases (The Secretariat of the House of Representatives Elderly and Social Development, 1991).

Age ranges are divided into 3 periods based on age, ability, and physical changes related to deterioration. The early elderly category includes individuals aged 60-69 years who are generally healthy and capable of taking care of themselves, obviously, they don't have any congenital diseases.

The middle elderly category comprises individuals aged 70-79 years, who are usually healthy but may start to rely on assistance for daily activities. The late elderly category consists of individuals aged 80 years and above, who require assistance for daily activities and healthcare (Banloo, 2018; Vilai, 2018).

The study compares the consumption behaviors of savory foods among different age ranges. The 7 types of savory foods examined include: boiled and curry dishes, fried foods, grilled foods, spicy salad, dipping foods with side dishes.

The age ranges are divided into 2 groups: The early elderly, 60-69 years old and the middle elderly, 70-79 years old. Both of these age groups experience physical changes associated with aging but still maintain relatively good health and are capable of performing daily activities, compared to the elderly in the 80 and above age range (Ng & Kul, 2022).

Research Methodology

This research is a quantitative method (Quantitative) to study the comparison of food consumption behavior with the age of the elderly in Thailand, the study process are as follows.

Population and sample groups

The population is the elderly aged 60-79 years. The sample group consisted of 120 elderly people. In this section, the researcher selected Purposive Sampling and Multi-Stage Random Sampling, which had the following steps:

Step 1) Bangkok Which is ranked No. 1 with the highest density of the elderly population of 978,455 people representing Thailand

Step 2) Eastern Bangkok has 9 districts: Bang Kapi, Saphan Sung, Bueng Kum, Khan Na Yao, Lat Krabang, Min Buri, Nong Chok, Prawet and Bang Na. The top 3 places with the highest number of elderly persons selected as research areas are Lat Krabang, Saphan Sung and Min Buri.

Step 3) There is a center to create happiness for all ages.

Step 4) Allows the researcher to enter the data collection area and is a voluntary method.

Step 5) Aged 60-79 years, divided into 2 age groups: early age 60-69 years, 60 people and middle age 70-79 years, 60 people, 56 males, 64 females. total 120 people.

Step 6) Can do daily activities able to travel by yourself can read books Able to write and answer questions.

Time scope of this research, the study was conducted from 10 March B.E. 2566 to 10 March B.E.2567.



Figure 1 Purposive Sampling Multistage random sampling

Research variables, include:

1: Independent Variables Personal characteristics variables were divided into 2 groups. 1) gender: 1st variable male, 2nd variable female, and 2) age range: 60-69 years old variable, 2nd variable 70-79 years old

2: Dependent Variable The savory food variables were divided into 7 categories: Variable (1) Boiled and Curry, Variable (2) Stir-fried, Variable (3) Steamed, Variable (4) Fried, Variable (5) Roasted and grilled, Variable (6) Yum, and Variable (7) Dipping and Side Dishes.

Tools used for data collection

The researcher used a questionnaire consisting of 2 parts, the details are as follows: 1. Tool Part 1: Personal characteristics - This section includes questions about gender, age range, marital status, education, average age, family members, and average monthly income. It also covers the behavior of selecting savory food consumption (Hasan, Atmuangkhwang, & Durand, 2022).

2. Tool Part 2: Comparison of savory food consumption behavior with age ranges - This section focuses on the comparison of savory food consumption behavior among different age ranges which are:

- 1) Boiled and Curry food, such as, Tom Yum, Tom Klong, Kang Jued, Kang Som, Kang Ped.
- 2) Stir-fried food, such as, plain stir-fry, spicy stir-fry, mixed vegetables, spicy catfish stir-fry.
- 3) Steamed food, such as, steamed fish, steamed chicken.

- 4) Fried foods, such as, fried fish, fried pork, fried chicken.
- 5) Roasted and grilled foods, such as, grilled pork, grilled chicken, roasted fish.
- 6) Spicy Salad foods with and without coconut milk, such as, Yam Toaplu, Yam Ruamit.
- 7) Dipping food with side dishes such as, mackerel chili paste, grilled fish chili paste, sweet fish sauce with neem, Taipala, various of simmer, often eaten with various vegetables and the age ranges are 60-69 years and 70-79 years.

Equipment Quality Check

1. Check for content validity, the researcher submitted a questionnaire to assess personal characteristics and food consumption behavior of the elderly in Thailand. for 3 qualified experts, consisting of: Experts in the Thai language, Experts in diet nutrition and Geriatric Experts, to verify content validity with the value of IOC consistency index, it was found to be at 1. After that, it was revised according to the suggestions before being confident and used to collect real data for structured questionnaires. The researcher has informally asked people who have the same qualifications as the sample group. Trial was conducted in a pilot study of 3 cases and resubmitted for quality checks by qualified experts.
2. Finding Reliability, the researcher led the questionnaire to assess personal characteristics and food consumption behavior of the elderly in Thailand. Go to trial with elderly people in nearby communities who look like a sample group of 30 people to find confidence. The Cronbach's Alpha Coefficient (Cronbach, 1951) was used to obtain a reliability of .89 in overall issue (Boni, 2022).

Data Collection Methods

Data collection in this study consisted of researchers and research assistants. The researchers were trained to clarify the details of questions and methods of data collection by the head of the research group. This training aimed to establish a common understanding of the purpose of data collection, as well as the questions and methods involved, so that the data collection operations could be carried out uniformly. Additionally, manual document archiving was used, along with 3 data collection techniques: Non-participatory observations were conducted to validate data, focusing on selective behavior and expression; Field notes were taken to record events or moments during inquiries and observations; Tape recording was used to ensure complete and accurate information was obtained when asking for it. The researcher clarified the research procedures and sought cooperation from the samples participating in the research project. It was specified that the participants could withdraw from the research at any time. The sample data would be kept confidential and used solely for this study. Presenting information as a whole required approval from the sample group. To participate in this research project, subjects were required to sign a consent letter (Gandhi, Robert, Palacios, & Chan, 2022).

Data analysis

The data analysis in this study was divided into two parts. First, text or important sentences were extracted from the questionnaire of the sample group to determine their meaning. These text-based responses were used to explain the data obtained from the statistical analysis, allowing for a broader understanding of the phenomenon being studied. The quantitative data, obtained from the questionnaires, were analyzed using statistical methods. The data were transformed into mathematical frequency values and processed using pre-existing calculation programs. The analysis was conducted in a descriptive statistical manner, which included finding the frequency, percentage, mean, and standard deviation. Additionally, a comparison of food consumption behavior among different age ranges of elderly people in Thailand was performed using ANOVA as a test.

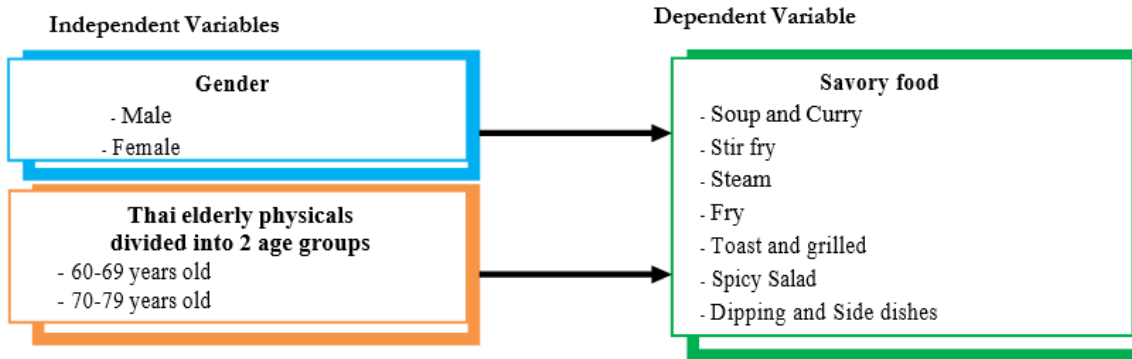


Figure 2. Conceptual framework for research variables

Results

The results of a comparison analysis of savory food consumption behavior and gender among Thai elderly using Multivariate Analysis of Variance (MANOVA) there were certain preferences in food consumption choices among Thai elderly. Specifically, when looking at the average characteristics of the 7 different types of savory food from Table 1, it was found that, there were some differences based on gender. Males showed a higher preference for consuming savory dishes such as boiled and curry dishes, steamed dishes, roasted and grilled dishes, fried dishes compared to females. These preferences were observed on average. However, it is important to note that these differences were not statistically significant.

The popular choice for consuming savory dishes, such as boiled and curry dishes, steamed dishes, grilled dishes, and fried dishes, was found to be higher among males compared to females. This observation may be attributed to the physical characteristics of males, which tend to deteriorate more than females, and personal taste preferences, with males generally focusing on meat, while females prefer clean or healthier foods, the popular choice for consuming savory dishes among them in a week includes savory dishes with dipping sauces and side dishes, stir-fried dishes, and spicy food. The researcher initially noted that this preference could be attributed to females having more taste buds than males, making them more sensitive to taste. Furthermore, as spicy food is common in Thai cuisine and tends to have lower caloric content, it may be appealing to females who aim to maintain their body shape. Regular consumption can lead to an acquired taste and personal preference. However, it is important to note that the difference in food selection between males and females was not statistically significant. (Table 1)

Table 1. Shows the results of gender variables that affect the food consumption behavior of the Thai elderly. The gender of the sample (n = 120).

Dependent Variable	Independent Variable	\bar{X}	S.D.	F	Sig.
1. Boiled and Curry food	Male	4.41	0.826	3.465	.314
	Female	4.14	0.732		
2. Savory fried food	Male	3.36	0.699	4.034	.294
	Female	3.89	0.875		
3. Savory steamed food	Male	4.18	0.664	1.897	.400
	Female	3.64	0.675		
4. Savory fried food	Male	3.14	0.586	1.100	.485
	Female	3.05	0.547		
5. Savory roasted and grilled food	Male	3.50	0.714	1.098	.485
	Female	3.11	0.475		
6. Savory spicy salad food	Male	3.14	0.554	1.237	.466
	Female	3.45	0.589		
7. Savory dipping and side dishes food	Male	3.79	0.756	13.633	.168
	Female	4.00	0.667		

*P<0.05, statistically different.

Comparative analysis of savory food consumption behavior with age range of Thai elderly Multi variance analysis (Multivariate Analysis of Variance: MANOVA)

Behavior of food consumption selection of 7 types of food and the age of the elderly were not significantly different in terms of statistical significance. But when considering the average of the characteristics of the type of savory food from Table 2, it was found that, the popular choice for consuming savory dishes, such as boiled and curry dishes, steamed savory dishes, roasted and grilled savory dishes, and fried savory dishes, was more prevalent among individuals in the age range of 60-69 years, compared to those in the age range of 70-79 years. The researcher initially hypothesized that the reason for this difference is that the physical deterioration in the age range of 60-69 years is less, compared to the age range of 70-79 years. Additionally, it may be attributed to personal preferences, as savory dishes like boiled and curry dishes with water as an ingredient are easier to swallow or chew.

In contrast, the popular choice for consuming savory dishes in the age range of 70-79 years includes dipping sauces with side dishes, stir-fried savory dishes, and spicy savory dishes. This may be due to the fact that individuals in the age range of 70-79 years' experience more physical deterioration compared to those in the age range of 60-69 years. Obviously, people aged 70-79 tend to have a habit of consuming dipping sauces and side dishes more frequently. These dishes are considered basic side dishes in Thailand, as many chili paste components have medicinal properties. For example, chili contains substances that make it spicy and have pharmacological effects on the gastrointestinal tract, which can increase the secretion of saliva and stomach acid. However, the level of selection was not statistically different in terms of statistical significance. (Table 2)

Table 2. Shows the results of age range variables that affect the food consumption behavior of Thai elderly people. Sample age range (n = 120)

Variable		\bar{X}	S.D.	F	Sig.
Dependent	Independent				
1. Boiled and Curry food	Ages range 60–69 years	4.41	0.826	4.976	.268
	Ages range 70–79 years	4.14	0.732		
2. Savory fried food	Ages range 60–69 years	3.36	0.699	8.308	.213
	Ages range 70–79 years	3.89	0.875		
3. Savory steamed food	Ages range 60–69 years	4.18	0.664	1.000	.500
	Ages range 70–79 years	3.64	0.675		
4. Savory fried food	Ages range 60–69 years	3.14	0.586	1.800	.408
	Ages range 70–79 years	3.05	0.547		
5. Savory roasted and grilled food	Ages range 60–69 years	3.50	0.714	0.839	.528
	Ages range 70–79 years	3.11	0.475		
6. Savory spicy salad food	Ages range 60–69 years	3.14	0.554	0.054	.855
	Ages range 70–79 years	3.45	0.589		
7. Savory dipping and side dishes food	Ages range 60–69 years	3.79	0.756	40.763	.099
	Ages range 70–79 years	4.00	0.667		

*P<0.05 statistically significant difference.

Discussion and Conclusions

From the objective of comparing the consumption behavior of savory food with the age of the Thai elderly. point out that Popular direction in choosing to consume savory dishes such as boiled and curry. In a week, males are more likely to choose than females, in the age range of 70-79 years. May choose the food that

they like mainly and are more familiar with food. Therefore, it does not affect the choice of food consumption. Therefore, the food consumption behavior of the Thai elderly, both gender and age, does not have much effect on food choice. The study's findings have the potential to significantly impact the industrial sector by informing food companies on the development of products that effectively cater to the dietary preferences of both male and female elderly individuals. Furthermore, these findings may uncover specific types of food that enjoy universal popularity among elderly individuals, irrespective of age. In addition, the interview on food consumption behavior is still a Thai way. Likes to eat spicy food Changing consumption behavior is quite difficult. because used to eat since childhood until old age If there is no disease to encroach on, consumption behavior will not change. The study's findings indicate that food containers tailored to the specific needs of Thai elderly individuals should be thoughtfully designed in order to effectively accommodate the characteristics of water-based foods. From the aforementioned issues, it can lead to planning the type of food that is suitable for the behavior and preferences of the elderly. But at the same time it leads to the significance of the research findings health care. In addition, to apply the method in the development of a nutrition promotion ecosystem for the elderly that is consistent with their behavior (Elderly Behavioral Center), such as formula development, food container development elderly care, etc.

Recommendations for Further Research

The following suggestions are based on the researcher's observations and can serve as guidelines for further research and promotion of elderly behavior. In order to enhance the study and research outcomes, the following factors should be considered in future studies:

1. Investigate the same topic in other provinces, regions or areas to identify potential variations in food consumption behavior.
2. Consider factors such as familiarity with childhood tastes and the influence of illnesses or serious conditions, as these can affect the dietary patterns of the elderly.
3. Utilize a combination of quantitative and qualitative research techniques to gain a comprehensive understanding of food consumption behavior among the elderly.
4. Conduct further studies to identify appropriate food consumption behaviors for the elderly population in Thailand.

These suggestions aim to support the advancement of research and the promotion of healthy eating habits among the elderly.

References

- Banloo, S. (2018). *Situation of the Thai Elderly 2017*. Mahidol University Institute, p. 1-5.
- Banloo, S. (2019). *Situation of the Thai Elderly 2018*. Printery.co., ltd. Vol. 1, p. 52-56.
- Banloo, S. (2020). *Situation of the Thai Elderly 2019*. Printery.co., ltd; Vol 1, p. 43-45.
- Boni, A. A. (2022). A Special Edition Focused on new Clinical and Commercial Opportunities in Digital Health. *Journal of Commercial Biotechnology*, 27(1).
- Cohen, R. Y., Brownell, K. D., & Felix, M. R. (1990). *Age and sex differences in health habits and beliefs of school children*. *Health Psychology*, 9: 208-224.
- CuLture Sports and Tourism Department. Youth Centre. (Accessed May 19, & <http://www.bangkok.go.th/cstd>).
- Gandhi, P., Robert, M. A., Palacios, J., & Chan, D. (2022). Effects of Contact Tracing and Self-Reporting in a Network Disease Model. *Letters in Biomathematics*, 9(1), 23–39–23–39.

- Hasan, M. E., Atmuangkhwang, S., & Durand, J.-D. (2022). Range extension of *Pomadasy andamanensis* McKay and Satapoomin 1994 (Perciformes: Haemulidae) to Bangladesh, the north-eastern Bay of Bengal with the indication of a cryptic sibling species from Bali, Indonesia. *FishTaxa*, 23, 30-41.
- Ng, K., & Kul, N. (2022). Data warehouse and decision support system for restaurant businesses. Official Statistics Registration System. (2016). old statistics of Thailand 77 provinces. (Accessed March 9, 2019). <https://stat.bora.dopa.go.th/stat/statnew/statMenu/newStat/home.php>.
- Perec, A. (2022). Desirability function analysis (DFA) in multiple responses optimization of abrasive water jet cutting process. *Reports in Mechanical Engineering*, 3(1), 11-19.
- Phitsanu, U. (2017). *Solving the problem of cooking and raw meat consumption behavior among the people through the participation of the Subdistrict Administrative Organization and shops*. . Khon Kaen: Department of Nutrition. Faculty of Public Health Khon Kaen University.
- Prawase, W. (2000). Health as the human ideology. *Nonthaburi: D Print Publishing House*. p. 5.
- Sirimon, C. (2010). *Chilli Paste Consumption Among Consumers in Bangkok Metropolitan*. . Journal of Srinakharinwirot University. (Science and Technology). 2 No. 3.
- The Secretariat of the House of Representatives Elderly and Social Development. (1991). *Elderly problems and solutions*. Bangkok: Senate, 1991.
- Vilai, K. (2018). *Geriatric Rehabilitation in Common Health Problems*. Siriraj Academic Affairs Faculty of Medicine Siriraj Hospital, Mahidol University. p. 6-8.
- Yela, D. A., Faber, M., Dantas, A., Benetti-pinto, C. L., & Jales, R. (2022). Difficulty in Diagnosing of Renal Choriocarcinoma: Case Report. *Jornal Brasileiro de Patologia e Medicina Laboratorial*, 58, e4122022.