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Correlation between Nutritional Awareness and Food Consumption of the Elderly in the Central of Thailand: A Cross-Sectional Study

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Abstract

Background: The world's population is currently aging. Diseases in elders are inevitable concerns that comes with age. Being aware of their dietary and eating habits can have a big impact on maintaining good health. Purpose was to study the correlating factors between personal demographic data, nutritional awareness and consumption behavior of the elderly in Central region of Thailand.

Methods: Individuals aged 60 years or older were randomly selected from the elderly population residing in five provinces located in Thailand's central region. They were interviewed using a questionnaire that consisted of three parts: personal information, a rating scale questionnaire about factors that nutritional awareness, and food consumption behavior. The descriptive analysis and an independent T-test (with a significance level of $p<0.05$) and Pearson Correlation were used to interpreted data in this study.

Results: The 1,120 adults with an average age of 66.70 years (between 60 to 84 years) (±0.56), 516 male (46.10%) and 604 females (53.90%), were included in this study. Out of which, 643 (57.40%) had a highest education level in below primary school. The personal data; educational level, family income, and living status, showed a significant positive correlation ($p=0.00$) with their eating behavior. The 3 factors of nutritional awareness were significantly correlated with food consumption behaviors; the emotional awareness ($r=0.53$, p-value=0.00), accurate self-assessment ($r=0.48$, p-value=0.00), and self-confidence ($r=0.08$, p-value=0.00).

Conclusion: (1) Personal data which are highest educational level, family income and living status show a significant positive correlation with food consumption behaviors. (2) All 3 personal awareness factors that are significantly corelate to food consumption behaviors.

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Background

The global population rapidly aging. In 2017 [1], more than 962 million, out of a total population of 7.4 billion, were in the age of 60 or older accounting for 13% of the global population. The World Health Organization in 2021 [2] has announced that the number of elderly people (aged 60 and over) is expected to reach 22% of the total population by 2050. This demographic shift has become a worldwide phenomenon. European countries are likely to experience the change first, with only 16% of their population being children and 21% being over 65 years old. Since 2005, Asian countries such as Thailand, Singapore, and Japan are rapidly becoming aging societies, withthe population aged higher than 60 have been accounting for more than 10% of the total population.Thailand's National Statistical Office has reported that currently more than 10.7% of the nation's population are in their elderly stage. In this number, 58.8% are late adults, 31.7% are mid-aged, and 9.5% being over 80 years old [3]. Although African countries have the highest population growth rate, with 42% of the population being children and only 5% being elderly, the average age of the total population of the world are still higher than before. This has led to social economic andhealth challenges the society.

One of the most significant concerns for elders is their nutrition intake and dietary. Nakwijit's study [4] reveals in her study that the common elderly meals in Thailand are negatively related to numerous health problems. Common diseases found in the elderly include diabetes, blood pressure abnormalities, heart and coronary artery diseases, gout, and cancers, and all of which are significantly influenced by food consumption behavior. There is a study published by Morais and others [5] that revealed that various health problems such as obesity, cardiovascular diseases and diabetes were mainly caused from poor nutrition and unhealthy eating behaviors. Understanding these causes and being able to follow guidelines are essential for the society and particularly the caregivers to promote healthy aging [6].

According to Natason et al.'s [7] research, lacking the knowledge or understanding about the role of food and nutrition in maintaining good health can lead to poor dietary choices, resulting in negative impacts on health such as obesity and other chronic or fatal diseases. Sun et al's research [8] results also show that dietary knowledge has a bigger effect on the health of rural residents than urban residents, which may be due to their different lifestyles. Wang et al.'s research indicates that over 31,588 people with the age over 50 years have been deceased due to coronary artery disease and diabetes. According to Kosulwat [9,10], individuals' food choices are influenced by a range of factors including personal tastes, cultural and social norms, advertisements, personal factors, and awareness of consumption. cation level

Several studies have shown that self-awareness is an important factor in promoting healthy eating behaviors among older adults. Additionally, demographic factors such as income, education level, and living conditions have also appeared to impact the eating habits of elders. For instance,older adults who live alone may be more likely to have poor dietary habits, while those with higherlevels of education and income may be more likely to have healthier diets.

It can be concluded from Yuswatiningsih and Dwi Ningsih [11] research titled "The Relationship between Self-Awareness and Dietary Compliance in Patients with Type 2 Diabetes Mellitus" found a correlation between self-awareness and dietary compliance with their subjects. According to Chung and Park [12] has conducted a study with similar results. In their study, theyfound that emotional awareness, accurate self-assessment, and confidence are psychological factors that play a crucial role in elders' diet. Emotional awareness refers to the ability to identifyand understand one's own emotions. Accurate self-assessment is the ability to evaluate one's ownstrengths and weaknesses realistically. Confidence refers to the belief in one's ability to perform atask successfully. These psychological factors are proved in many researches to have an influence older adults' eating behavior by affecting their motivation, attitudes, and beliefs towards food and eating. erosion. Good

The preservation of optimal dental and oral health is crucial for maintaining overall healthand well-being. An important factor that can considerably affect dental and oral health is an individual's dietary habit and self-awareness. Food choices play a critical role in promoting dental health, as certain foods can cause tooth decay and erosion, while others can contribute to healthy teeth and gums. In addition to food choices, the timing and frequency of meals can also impact dental health. Limiting snacking and opting for well-balanced meals can help prevent teeth erosion. Good oral hygiene habits, such as brushing twice daily and flossing, along with regular dental checkups and cleanings, can also help maintain dental health. Being attentive to any changes in dental or oral health, such as tooth sensitivity, bleeding gums, or bad breath, is important and mayrequire attention from a dental professional.

Nonetheless, the mentioned studies are mostly based out of Thailand. Therefore, researchers aim to investigate the relationship between personal data, emotional awareness, accurate self-assessment, confidence, and older adults' eating behavior in the Thailand. Although researchers have conducted similar studies in Thailand before, we are seeking to expand on previous researches by increasing the sample size and including participants from a larger area of Central Thailand, in order to investigate how different societal and cultural factors impact the nutritional awareness and food consumption behavior of elderly individuals. The findings of this study will be useful for improving guidelines and developing better policies for the elderly population in the field of dental public health.

Material and Methods

This research has been reviewed and certified by the Research ethical committee, prior to the study. The purpose of our cross-sectional study is to study and analyze how personal factors; age,gender, education, income, and family-existence and personal awareness including emotional awareness, accurate self-assessment and self-confidence affect elders' eating behavior. Oursubjects were people, both male and female, aged 60 years and older who were fully aware and could fully communicate. The study subjects were members of Senior club in different provinces located in the Central part of Thailand. Structured interviews and questionnaires were used to collect data, which were then analyzed to assess the relationship between personal data, nutritional awareness and consumption behavior of the elderly participants.

Research population

According to data from the Ministry of Social Development and Security of Thailand, there are atotal of 2,977,036 senior citizens age over 60 years who reside in the central region of

Thailand and live with either their family or a caregiver. The sample size for this study was determined using Taro Yamane's formula as follows:

$n = N/(1+N(e)^2)$

As n = The Sample Size

N = The Population under study

e = The acceptable sampling errors (=0.05)

From calculation, the sample size was calculated to 1,110 people.

Simple random sampling method was used to select individuals from five provinces locatedin the central region of Thailand to obtain a sample size of 1,120 participants for this study. The provinces included Suphanbury, Samutprakarn, Nakhonprathom, Nakhonnayok, and Nakhonsawan (224 participants from each province equally). The interview and questionnaire questions used in the study were adapted from Daniel Goleman's [13] self-awareness theory and the nine nutritional guidelines for the elderly. Prior to the actual study, these questions were testedand reviewed with a small group of individuals aged between 50-59 years.

Inclusion criteria

1. People aged 60 or over.
2. Residents who had been living in each province for at least 6 months
3. People in their full conscious, showed no sign of dementia and could communicate perfectly with no trouble hearing.
4. People who were able to eat without any health concerns limitation.
5. People who did not require physical or mental assistance.
6. People who had four natural posterior teeth (two opposing teeth) or functional dentures atthe time of interview.

Exclusion criteria

1. Elders who could not freely choose their own meal e.g., members of senior housing.
2. Elders with dietary restrictions.
3. Elders with no teeth or not wearing dentures.

The sample group was interviewed by the researchers with the assistance of village health volunteers and dental nurses in the area. Prior to the interviews, inter-examiner calibration was conducted. Each subject was interviewed individually by the researchers for approximately 10 minutes, during which they were asked about their personal information, nutrition awareness, andconsumption behavior. The specifics of the interview process are shown below:

The data collected from the sample group consisted of three sections:

1. Personal Information: Sex, age, highest education level, family income, and living status.

2. Nutrition Awareness: This section contained questions based on Goleman's [13] Mixed Model of Emotional Intelligence Theory, and adapted from Sakoolnamarka and Rungsiyanont's [14] research questions. The questions particularly focused on Emotional awareness, Accurate self- assessment, and Self-confidence rating.

3. Consumption Behavior. This section included questions on the frequency of elderly food consumptions over a certain period of time. The questions were adapted from Rungsiyanont and Sakoolnamarka's [14] research questions.

The collected data were analyzed and interpreted by scoring system with the following criteria: Nutrition Awareness, positive behavior was scored as 5 for Very agreed, 4 for Agreed, 3 for Neither agreed nor disagreed, 2 for Disagreed, and 1 for Totally disagreed. For negative behavior, the scoring was reversed, with 5 for Totally disagreed and 1 for Very agreed.

Consumption Behavior, the scoring was based on the frequency of healthy/unhealthy food consumption. For healthy behavior, 5 was scored for Every day, 4 for Almost every day, 3 for Every other day, 2 for Once a week, 1 for Rarely, and 0 for Not once. The scoring was reversed for unhealthy behavior, with 5 for Not once and 0 for Every day.

Then, the average scores for each topic were calculated to reflect the behavior of the sample group. To ensure the reliability of the data, the Cronbach's alpha method was applied. The calculated data were then analyzed to identify factors that affect elders' consumption behaviors using the following statistical tests, independent t-tests, One-way ANOVA, and Pearson correlation coefficient. The data obtained in the study were analyzed and interpreted utilizing SPSS version 23.0 (SPSS Inc., Illinois, USA). A confidence level of 0.95 was set for the tests. Normality test was also conducted to check if the obtained data, including nutrition awareness and consumption behavior, followed a normal distribution. The results of the Skewness and Kurtosis test indicated that the values were within the acceptable range of -1.00 and +1.00, signifying that the data were normally distributed.

The internal consistency reliability of the questionnaires was assessed by three professionals. The content validity and appropriateness of the language used, which was evaluatedthrough the Index of Item-Objective Congruence (IOC). The IOC index was over 0.5 confirming the validity of content. Reliability was assessed by interviewing a similar sample group using the same set of questions prior to the actual interview. The Cronbach's alpha reliability coefficient was found to be between 0.79-0.81.

Results

From the total of 1,120 older adults, 516 (46.10%) were male and 604 (53.90%) were female, aged range from 60 to 84 years old (±0.56) and the average age at 66.70 years old. There were 643 (57.40%) with the highest education level at under primary school. 42.90% of the subjects had an income of less than 6,000 Baht per month. Most of the participants (90.90%) resided with their family. The results are shown in Table1.

Table 1: The demographic findings in the research population.

Demographic data	Amount	Percentage(%)
Sex		
Male	516	46.10
Female	604	53.90
Education		
Under Primary School	643	57.40
Primary school	249	22.20
Secondary School	105	9.40
High School /Certificate	81	7.20
Bachelor's degree or above	42	3.70
Family income		
Under 6,000 THB	480	42.90
6,000 - 10,000 THB	448	40.00
10,001 -25,000 THB	144	12.90
25,001 - 50,000 THB	40	3.50
50,000 THB or above	8	0.70
Living status		
Live alone	102	9.10
Live with others	1018	90.90
	1120	

Source: Author's study.

The demographic data were analyzed in comparison with the answered consumption behavioral data using independent t-tests and one-way ANOVA. The result of the overall test showed statistically significant effect of highest education level, family income and living status on an elderly's consumption behavior (p=0.00).

Individual nutritional awareness data were calculated to find the mean scores for each topic. The calculated scores were then interpreted as very low or lowest for scores between 0.00- 2.50, low for scores between 2.51-3.00, fair or moderate for scores between 3.01-3.50, high for scores between 3.51-4.00 and very high or highest for scores more than 4.01.

Emotional awareness

The study found that the subjects were highly aware about the fact that they enjoyed having companies while eating (average score of 3.74). They had a fair level of awareness of their lack of guiltiness while consuming junk or unhealthy food (average score of 3.36), their happiness while they were able to eat as much as they wanted (average score of 3.18) and their satisfaction while consuming unhealthy foods that they liked (average score of 3.28). However, the subjects had a low level of awareness of "feeling guilty for eating junk foods", "feeling guiltyfor not finishing a meal" and "feeling good when finishing drinks after a meal", with average scores of 2.80, 2.61, and 2.56, respectively. The lowest level of awareness was on guiltiness after consuming unhealthy food (average score of 2.00). Overall, the subject's average emotional awareness was at a low level (average score of 2.84). The results are shown in Table 2.

Table 2: Emotional awareness in population.

Items	Mean	Standard deviation	Interpret
You are not guilty for not finishing a meal	2.70	1.43	low
You feel good when finishing drinks after a meal	2.56	1.33	low
It's alright not to eat the meal on time	2.49	1.27	very low
You are not feeling guilty after consuming unhealthy food	2.00	1.35	very low
You are not feeling guilty for having a leftover meal	3.36	1.30	fair
You feel good when get to eat as much as you like	3.28	1.00	fair
You are contented when having soft drinks as whenyou feeling thirsty/hungry	2.83	1.47	low
You love to eat with others	3.79	1.14	high
It's alright to eat unhealthy food which you like	2.61	1.38	low
You are not feeling guilty for eating junk foods	2.80	1.43	low
Total	2.84	1.31	low

Source: Author's study.

Accurate Self-Assessment: Table 3 below presents the results of an accurate self- assessment test. The respondents demonstrated a high level of accuracy in their self-assessment for the following questions "You are able to recognize when you are full" at 3.85, "You do recognize your ability to consume spicy food" at 3.83 and "You are able to indicate the healthy food portions in your daily consumption" at 3.53. However, they demonstrated low levels of accuracy in their self-assessment in resisting tempting desserts even when aware of their negative health effects (2.91) and assessing calorie intake after a meal (2.76). The average accurate self- assessment score in the population was in the fair level, with an average score of 3.28.

Table 3: Accurate Self-Assessment in population.

Items	Mean	Standard deviation	Interpret
You will not stop consuming until you feel full even though you have already had a lot.	3.23	1.33	fair
You do realize that you are not able to chew on hard food.	3.19	1.36	fair
You eat tempting desserts even when you recognize that it is not good for your health.	2.91	1.41	low
You are willing to eat dislike vegetables	3.13	1.20	fair
You are mindful of your consciousness after consumingalcohol	3.14	1.68	fair
You are able to recognize when you are full	3.85	0.97	high
You do recognize your ability to consume spicy food	3.83	0.91	high
You are able to indicate the healthy food portions in your daily consumption	3.53	0.89	high
You are able to indicate the unhealthy food portions in your daily consumption	3.21	1.00	fair
You are able to assess calories intakes after a meal	2.76	1.02	low
Total	3.28	1.18	fair

Source: Author's study.

Self-confidence

The subjects showed high levels of confidence in the healthiness of theirmeals (average of 3.82) and their daily consumption of fruits and vegetables (average of 3.76). However, they appeared to have only moderate levels of confidence in their ability to guide otherson the risks and benefits of their meals (average of 3.33) and control food portions in each meal (average of 3.24). Their lowest confidence levels (average of 2.27) were for mistrusting the taste of food cooked by others. The average self-confidence score was fair, with an average of 3.35. The following Table 4 presents the results of a Self-confidence test.

Table 4: Self-Confidence score in population.

Items	Mean	Standard deviation	Interpret
You assure that you have ability to make healthy food choices for yourself	3.57	1.04	high
You assure that you have ability to make healthy food suggestions for your family	3.52	0.96	high
You assure that you eat with confident that your meals are healthy.	3.82	0.93	high
You assure that you consume enough fruits and vegetables on a daily basis	3.76	0.96	high
You assure that you have ability to guide others on risk and benefits of their meals	3.33	1.14	moderate
You assure that you have ability to control food portions in each meal	3.24	0.83	moderate
You mistrust of the food taste which was cooked by others	2.27	1.36	lowest
Total	3.35	1.03	moderate

Source: Author's study.

Consumption Behavior results were also calculated to find mean scores. The calculated scores were then interpreted the same way as individual nutritional awareness data. The results showed that the highest consumption behavior was scored at 4.43 for drinking water from reliable sources and consumed properly washed and cooked food. Followed by Regularly consuming sweetfruits or drink sweet juices at 3.84, Eating more than 3 meals a day at 3.83 and Eating vegetables and tuber corps at 3.72. Consumption behaviors that had scored "Very low" were Eating less than3 meals a day, taking vitamin or/and food supplement and having yogurt, scored at 1.31, 1.92 and 1.97 respectively. The overall consumption behavior was moderate at 3.06. The results are as displayed in Table 5.

Table 5: Consumption Behavior in Population.

Items	Mean	Standard deviation	Interpret
Eat desserts and baked goods	2.92	1.16	low
	3.52	0.96	high
Eat more than 3 meals a day.	3.83	1.11	high
Eat less than 3 meals a day.	1.31	1.30	lowest
Drink Soda and soft drink.	2.97	1.36	low
Drink milk and dairy products	2.53	1.29	low
Drink alcohol beverages.	3.21	1.70	moderate
Drink caffeinated drinks; Coffee, Tea, Coke.	2.62	1.47	low
Eat vegetables and tuber corps	3.72	1.19	high
Have vitamin or/and food supplement.	1.92	1.74	lowest
Eat crunchy snacks; chips, popcorn, dried fruits.	2.75	1.42	low
Eat variety of foods from each of 5 food groups	2.89	1.03	low
Eat whole grains and whole grain products	3.12	1.57	moderate
Eat sweet fruits or drink sweet juices	3.84	1.11	high
Eat protein foods; egg(s), nuts, meat.	3.57	1.24	high
Eat or drink yogurt.	1.97	1.36	lowest
Eat rich cheesy, mellow or/and savory food.	3.02	1.30	high
Drink water and drinks from trustworthy sources	4.43	0.93	highest
Eat properly washed and cooked food	4.43	0.88	highest
Nibble food or snack between meals	2.91	1.26	low
Eat salty food	3.14	1.60	moderate
Total	3.06	1.30	moderate

Source: Author's study.

Personal data and average awareness scores, including emotional awareness, accurate self- assessment, self-confidence, and consumption behavior were then analyzed together using Independent T-test and One-way ANOVA techniques. The results, as presented in Table 6, indicate that personal data including education, family income, and living status had the greatest impact not only consumption behavior but also on all three awareness categories.

Table 6: Demographic analysis on factors influencing self-awareness and food consumption.

Demographic data	Statistic	Emotional Awareness	Accurate Self- Assessment	Self- Confidence	Consumptionbehavior
Sex	Independent T test	P = 0.94	P = 0.93	P = 0.73	P =0.20
Education	One-way ANOVA	P =0.00**	P =0.00**	P =0.00**	P = 0.00**
Income	One-way ANOVA	P =0.00**	P =0.00**	P =0.00**	P =0.00**
Living status	One-way ANOVA	P = 0.00**	P = 0.00**	P = 0.00**	P =0.00*

Source: Author's study.

The relationship between all three personal awareness categories and consumption behavior among the elderly in Central Thailand were also proved to be significant positive correlation, with significance levels at 0.00 as exhibited in Table 7.

Table 7: Correlation by Pearson's statistical between all 3 personal awareness and the elderly's Consumption behavior.

Correlation		
Personal awareness	**Statistic**	**Consumption behavior**
Emotional Awareness	Pearson Correlation Sig. (2-tailed) N	0.53 000** 1120
Accurate Self-Assessment	Pearson Correlation Sig. (2-tailed) N	0.48 000** 1120
Self-Confidence	Pearson Correlation Sig. (2-tailed) N	0.08 000** 1120

** Correlation is significant at the 0.05 level (2-tailed).
Source: Author's study.

Sheffe's Method was applied to compare the mean difference between educational background, family income and living status data and the subjects' food consumption behavior after statistical significance of the data were confirmed through variance testing (F). The test results indicated that educational levels, family income, and living status significantly influenced individuals' food consumption behavior and awareness.

Food consumption behavior scores were significantly lower for individuals with education levels below primary school compared to those in primary school, high school, and bachelor's degree programs, with differences of 0.15, 0.27, and 0.30, respectively.

Regarding the connection between demographic data and emotional awareness, individuals with the highest education level at below elementary had a significantly lower mean value compared to those with a high school (mean difference=0.31) education. Similarly, individuals with the highest education level at elementary had a significantly lower mean value in comparisonto ones with secondary school (mean difference=0.32) and high school (mean difference=0.43) degrees. The same connections were seen in the ability to accurately assess themselves. In Individuals with the highest education level at primary school had a lower self-assessment accuracy compared to those in secondary school, high school, and bachelor's degree programs, with significant differences of 0.25, 0.36, and 0.37, respectively. People with education levels below primary school tended to have the lowest self-confidence compared to other groups, including primary school, secondary school, high school, and bachelor's degree programs, with significant differences of 0.22, 0.36, 0.55, and 0.74, respectively. The results are presented in Table 8.

Table 8: The mean differences in people's awareness and behaviors between each level of the population's highest education.

Dependent VariableMean	(I) Education	(J) Education	Difference(I-J)	Std. Error
Emotional Awareness	Under Primary school	High School	-0.31**	0.09
	Primary school	Secondary School	-0.32**	0.07
		High School	-0.43**	0.08
Accurate Self-Assessment	Primary school	Secondary School	-0.25*	0.07
		High School	-0.36**	0.08
		graduated	-0.37*	0.11
Self-Confidence	Under Primary school	Primary School	-0.22*	0.06
		Secondary school	-0.36*	0.09
		High School	-0.55**	0.09
		graduated	-0.74**	0.12
Consumption behavior	Under Primary school	Secondary school	-0.15*	0.05
		High School	-0.27*	0.08
		graduated	-.030*	0.10
	High School	Primary school	0.27*	.079
		Secondary School	0.31*	.097

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
Source: Author's study.

Results from Sheffe's Method have indicated that elders with an average family income between 6,000-10,000 Baht/month had higher levels of food consumption behaviors than those with monthly incomes less than 6,000 Baht, however, lower than elders with 25,001-50,000 Baht monthly income group, with significant mean differences of 0.22 and 0.35, respectively. Additionally, the group with an average family income of less than 6,000 Baht per month also had the lowest level of emotional awareness, with significant mean differences of 0.30, 0.82, 0.89, and 1.21 in comparison to those with higher monthly incomes of 6,000-10,000 Baht/month, 10,001- 25,000 Baht/month, 25,001-50,000 Baht/month, and over 50,000 Baht/month. Likewise, the group also had lower levels of accurate self-assessment compared to those with average family incomes in the range of 10,001-25,000 Baht and 25,001-50,000 Baht per month, with significant mean differences of 0.47, 0.50, and 0.98, respectively. The elderly with a monthly income of 6,000- 10,000 Baht also had lower levels of self-confidence compared to those with average family incomes in the range of 25,001-50,000 Baht and 50,000 Baht or above per month, with significant mean differences of 0.44 and 0.87, respectively. The findings are in Table 9.

Table 9: The mean differences in people's awareness and behaviors between each level of the population's Income.

Dependent Variable Mean	(I) Income	(J) Income	Difference (I-J)	Std. Error
Emotional Awareness	Under 6,000	6,000 - 10,000	-0.30**	0.04
		10,001 -25,000	-0.82**	0.06
		25,001 - 50,000	-0.89*	0.10
		50,000 or above	-1.21*	0.21
Accurate Self-Assessment	Under 6,000	10,001 -25,000	-0.47**	0.06
		25,001 - 50,000	-0.50*	0.11
		50,000 or above	-0.98*	0.23
Self-Confidence	6,000 - 10,000	25,001 - 50,000	-0.44*	0.13
		50,000 or above	-0.87*	0.27
Consumption behaviors	6,000 - 10,000	50,000 or above	-0.22**	0.04
		10,001 -25,000	-0.40**	0.06
		25,001 - 50,000	-0.57**	0.10
		50,000 or above	-1.21**	0.22
		Under 6,000	0.22**	0.04
		25,001 - 50,000	-0.35*	0.10

** Correlation is significant at the 0.01 level (2-tailed).
* Correlation is significant at the 0.05 level (2-tailed).
Source: Author's study.

Lastly, In Table 10 revealed that the elderly who lived alone showed significantly lower levels of emotional awareness, accurate self-assessment, self-confidence and also consumption behaviors compared with ones who lived with family at 0.28, 0.35, 0.16, and 0.16 sequentially.

Table 10: The mean differences in people's awareness and behaviors between each level of the population's Ling Status.

Dependent Variable Mean	Living Alone	Living with Family	Difference
Emotional Awareness	2.59	2.87	-0.28**
Accurate Self-Assessment	2.96	3.31	-0.35**
Self-Confidence	2.73	3.42	-0.16**
consumption behaviors	2.91	3.07	-0.16**

Source: Author's study.

Discussion

There are interesting findings in this study which revealed a connection between elders incentral Thailand's personal factors, personal awareness, and their food consumption behavior. The outcome provides insights into how both internal and external factors can impact the dietary behaviors of the elderly. The findings indicate that elders' highest educational level, family existence and average family income play a significant role in their eating behavior. Moreover, theresearch also found that there is a positive correlation between elders' emotional awareness, self- assessment, and confidence, and their food consumption behavior.

The results, which revealed that personal demographic data have an effect on elders' eating behavior are consistent with the findings of Sakoolnamarka and Ransiyanon's [14] research study titled "Correlation Between Nutritional Awareness and Food Consumption Behaviors of The Elderly in Samutprakarn Province." Additionally, Sakoolnamarka et al. [15] conducted a similar study titled "Correlation Between Nutritional Awareness and Food Consumption Behaviors of The Elderly in Nakorn Nayok Province." which also found a direct relationship between elders' highest level of education and their nutritional awareness. Furthermore, their studies concluded that family income had an influence on the elders' ability to assess themselves accurately.

To understand more about the relationship between level of education and eating behavior, researchers have found more evidence in Han et al. [16] in their study titled "Predictors of nutritional status among community-dwelling older adults in Wuhan, China," stated that education level and personal income were significantly correlated with nutritional status. Similarly, Chang et al. [17], stated in their study regarding BMI changes that individuals with higher levels of education were more likely to accurately perceive their own weight status and were more likely to engage in healthy weight management behaviors compared to those with lower levels of education.

There are several reasons why education can have a significant impact on a person's eating habits. Educated individuals usually have the necessary knowledge and understanding of a healthy diet, the importance of balanced meals and the potential risks and damages that come with poor eating habits. Education can also provide a supportive environment where people share their knowledge and experiences. By improving their understanding individuals can make better food choices and improve consumption behavior.

The findings in this research also showed that socioeconomic status or income rate can impact elder's eating behavior. Individuals with higher income rate usually have a better access to healthier and more diverse food options. On the other hand, those with lower incomes tend to live in areas with limited access to healthy foods and had less resources to purchase to fresh and better-quality foods.

The findings of Han et al. [16] support a positive correlation between elders' family incomeand their dietary habits. Similarly, in research conducted by Chang and Christakis [17] titled "Self-perception of weight appropriateness in the United States", individuals with lower income were less likely to accurately perceive their own weight and to underestimate their own weight status compared to those with higher incomes, which affect

their eating habits and behaviors.

Emotional awareness along with accurate self-assessment, and self-confidence are also positively related to elders' consumption behavior, which has been demonstrated in several studies. For instance, Sakoolnamarka et al.'s study [15] titled "Correlation Between Nutritional Awareness and Food Consumption Behaviors of The Elderly in Nakhon Nayok Province" demonstrated a positive correlation between emotional awareness, accurate self-assessment, self-confidence, and food consumption behaviors in the elderly. Similarly, Leila et al.'s [18] study regarding "Understanding the relationship between nutritional knowledge, self-efficacy, and self- concept of high-school students suffering from overweight." revealed a direct relationship between nutritional knowledge, self-efficacy, and self-concept among overweight high-school students.

Other studies have supported these findings. Crescioni et al. [19] stated in their study "High trait self-control predicts positive health behaviors and success in weight loss." Junger and Kampen [20] research titled "Cognitive ability and self-control in relation to dietary habits, physical activity, and body weight in adolescents" and Adriaanse et al.'s [21] study titled "Effortless inhibition: Habit mediates the relation between self-control and unhealthy snack consumption" published in Frontiers in Psychology, all demonstrated that self-regulation of eatingis likely to interact with biologically-mediated variation in appetite. Furthermore, they found thatgeneral self-regulation questionnaires show only modest associations with healthy eating behaviors and weight control.

In addition, Sawdon et al. [22] disclosed a correlation between eating disorder and depressive symptoms and self-discrepancies in their "The relationship between self-discrepancies, eating disorder and depressive symptoms in women" study. Tamhane's [23] master thesis, "The Role of Body Image, Dieting, Self-Esteem and Binge Eating in Health Behaviors" also found a relationship between body image, dieting, self-esteem, and binge eating.

Family existence is another factor that surprisingly encourage healthier eating behavior. Many previous studies have indicated that living alone can have a significant impact on the eatinghabits of the elderly. Elders who live alone are more likely to consume processed or pre-cooked foods as it is more convenient. Many elders choose to only prepare healthy foods with visitors or family members presence. Social isolation can also result in lack of appetite and interest in food because of loneliness and depression. Furthermore, people with age are less likely to get around for fresh and good quality meals.

In their research on "Relationship between living alone and food and nutrient intake" Hanna and Collins 's [24] revealed that living alone could negatively affect some aspects of food intake and contribute to the relationship between living alone and poor health outcome. Conklin et al. [25] have demonstrated that in their study that living alone could result in poorer dietary habits, including lower consumption of fruits and vegetables and higher consumption of processed foods. Additionally, Chang et al.'s [26] research titled "Do living arrangements matter? Evidence from eating behaviors of the elderly in rural China" stated that living alone is negatively associated with a worse diet among elderly people

In summary, maintaining good dental and oral health requires a combination of nutritious food choices, proper meal timing and frequency, regular dental checkups, and good oral hygiene habits. Being self-aware of any changes or issues can also help prevent and address dental problems.

Conclusions

To conclude, results from this study have given us a better understanding of how personal awareness factors; emotional awareness, accurate self-assessment and self-confidence, personal factors; highest education level, family income and living status can significantly impact food consumption behavior (p=0.00). By understanding this relationship, we as a society can help promote healthy eating habits and develop education plans and activities for elders and their familyto reduce diet-related diseases. Further studies are needed to deepen our understanding of the complex relationship between personal factors, personal awareness, and food consumption behavior and to develop more effective interventions that improve elders' eating choices.

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Author's contributions

They conceived the research idea (SR), elaborated the article (SS,SR), collected, tabulated the information (SS,SR), carried out the bibliographic search (SS,SR), interpreted the statistical results (SS), helped in the development of the discussion (SS,SR), and performed the critical review of the article (SS,SR). All authors approved the final version of the article.

Ethical policy and institutional review board statement

This research respected the bioethical principles for medical research involving human subjects of the Declaration of Helsinki related to confidentiality, freedom, respect, and nonmaleficence.This research has been reviewed and certified by the Research ethical committee, Srinakharinwirot University; Certification Number SWU-EC120/2565E prior to the study.

Patient declaration of consent

Not applicable

Data Availability statement

The data that support the study results are available from the author (Assoc.Prof. Sorasun Rungsiyanont, e-mail: sorasun@g.swu.ac.th) on request.

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