Healthy Food Choice in Thailand: An Investigation into Illness Knowledge and Sociodemographics

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Abstract You are what you eat. Food choices have been found to have effects on people and their diseases. Given plain taste, healthy food choices are less popular. This study aimed to investigate relevant factors of healthy food-choice decisions among healthy and unhealthy consumers. We examined the impact of awareness of health conditions (illness knowledge) and sociodemographics on food-consumption behavior using logistic regression models. Empirical results showed that consumers place taste as the key determinant when making food-consumption decisions. Men are more inclined towards unhealthy food choices than women. Ageing helps sway consumers to eat more plain food. Illness knowledge influences consumer preferences towards a healthier option, the plain taste food. However, illness knowledge has less influence on educated consumers and older consumers who exhibit strong fixation on tasty food preference. Education helps consumers form healthy food preferences rather than alters existing preferences towards healthy food choices. In promoting healthy food choices, awareness of health status becomes a vital factor. Health checkup campaign is therefore encouraged, supporting consumers to wisely consider healthier food choices.

Keywords: food choice, plain taste, healthy food consumption, illness knowledge, consumer wellbeing

1. Introduction

Population ageing is evident in virtually every country in the world. According to the United Nations, the number of people in the world aged 60 years or over is estimated to grow from 901 million in 2015 to 1.4 billion in 2030. Specifically in Asia, the ageing population is projected to grow by 66% in the next 15 years [1]. This phenomenon is due to advancements in public health and medical technologies, coupled with reductions in birth rates. Although lower fertility and mortality rates are results of successes in terms of economic and social development, the adverse effects of population ageing require careful attention. For instance, when the number of older persons increases much faster than the number of population in the working ages, governments are challenged by the financial sustainability of pension systems. In addition, this demographic shift places a dire burden on health care providers as an ageing population is associated with non-communicable diseases and chronic conditions [2].

In the Asia-Pacific region, cardiovascular disease has been reported to be a major cause of death [3]. A large stream of literatures, therefore, attempt to investigate the roles of nutrition on the population's health to promote citizens' health [3-12]. For instance, a study on Japanese populations associates intakes of fish, soy, seaweed, and green vegetables with the longevity of Okinawans.

Another research conducted in Myanmar and Korea demonstrated a relationship between salt consumption and hypertension [5,9]. Apart from these findings, sugar, oil, and carbohydrates are among the commonly known unhealthy foods [13]. In particular, sugar has been claimed to drive insulin resistance in the body which, in turn, becomes an underlying cause of type 2 diabetes and heart disease [14,15,16]. In sum, consumption of food with plain taste can be considered to be healthier than its counterparts.

With the established relationship between food and health, researchers aim to identify determinants of consumers' food choices [17,18,19,20,21,22]. A study conducted in the United States concludes that taste is the most important factor when consumers make food choices, whereas cost stands as the secondary determinant. In addition, demographics and lifestyles are also found to be influencers when consumers make food-consumption decisions [18]. On the other hand, nutrition knowledge has also been argued to impact consumers' food behavior [19]. This notion supports the enforcements of nutrition labeling laws. As of 2016, the back-of-pack (BOP) nutrition labeling is mandatory in many countries around the world including several in the Asia-Pacific, such as Hong Kong, China, Japan, South Korea, Malaysia, Taiwan, Thailand, Philippines, Indonesia, Australia, and New Zealand [23]. Yet, the health situation in most countries remains unimproved. Though this may suggest that knowledge is not capable of malleating consumers'

food preference, this paper would like to test whether knowledge of being ill will encourage healthy food choices. More specifically, we aim to answer the following research questions:

1. Will consumers change their food behavior if they are aware that they have a chronic disease?
2. Do sociodemographic variables play a role on consumers' food behavior?
3. Does the impact of knowledge of being ill vary by sociodemographic variables?

2. Methods

2.1. Data

To answer the above questions, the study used publicly available data on health and wellness survey in Thailand to estimate logistic regression models. The data were from the National Statistical Office of Thailand (TNSO). In March 2013, the survey was conducted by the TNSO among 63,277 households located across Thailand, focusing on their preferences of main dish taste as well as health status. In addition, the data also contained detailed sociodemographic information such as age, gender, and education. We removed observations where responses were incomplete. Consequently, the final dataset consisted of responses from 63,181 households.

Table 1. Characteristics of Respondents

Household Demographics (n = 63,277)		
Education		
	No education	5.8%
	Pre-primary school	23.8%
	Primary school	32.8%
	Junior high	13.8%
	Traditional high school	8.5%
	Vocational high school	2.7%
	Vocational	3.3%
	College	8.1%
	Graduate School	1.1%
Gender		
	Male	47.2%
	Female	52.8%
With chronic disease		
	Yes	20.4%
	No	79.6%
Age		
	Mean	40.4
	Standard deviation	20.3
	Minimum	6.0
	Maximum	98.0

To determine potential factors influencing individuals to choose plain food, we operationalized variables used in

the analysis, as follows. In the survey, individuals were asked: "In general, what is the taste of your main dishes?" Possible responses include plain, sweet, salty, sour, and others. Therefore, the dependent variable, $plain$, takes on the value of 1 if the answer was 'plain', and 0 otherwise. The focal independent variable, illness knowledge, which proxies for awareness of being ill was measured by the question: "Do you have a chronic disease?" If an individual i is aware that s/he has a chronic disease, the dummy variable, D_i, takes on the value of 1, and 0 otherwise.

Demographic variables include gender, age, and education. Gender is denoted by $Gender \in \{1 = \text{man}, 0 = \text{woman}\}$. Age is incorporated into the model as a ratio scale. Education reflects an individual's highest level of education attained. It takes the following values: $Education \in \{1 = \text{no education}, 2 = \text{pre-primary school}, 3 = \text{primary school}, 4 = \text{junior high}, 5 = \text{traditional high school}, 6 = \text{vocational high school}, 7 = \text{vocational school}, 8 = \text{undergraduate school}, \text{and } 9 = \text{graduate school}\}$. The detailed characteristics of the respondents are given in Table 1.

2.2. Logistic Regression Model

To investigate the relationship between health status knowledge and food-consumption behavior, logistic regression models were estimated. Logistic regression analysis is often used when the dependent variable is a discrete response [24,25,26,27,28,29]. Let π_i be the response probability that an individual i regularly consumes plain food as main dishes. The log-odd of the logistic regression model can be written as:

$$logit(\pi_i) = \log\left(\frac{\pi_i}{1-\pi_i}\right) = \alpha + \beta D_i + \delta Z_i + \gamma D_i Z_i + \varepsilon_i \ (1)$$

α is an intercept term representing intrinsic log-odd of preferring plain food rather than food which are predominantly sweet, salty, spicy, or sour. Therefore, if the intercept term is estimated to be positive, one could infer that individuals prefer plain food on average. β is a parameter capturing the effect of illness knowledge (D). δ is a vector of demographic parameters (Z) that include gender, age, and education. γ is a vector of parameters that account for interaction effects between demographic (Z) variables and illness knowledge (D) dummy. Assume a random error term ε_i to follow binomial distribution, which is independent. This renders a logistic regression model.

IBM SPSS Statistics version 21 was used both to provide descriptive statistics and to conduct logistic regression analyses.

3. Results

3.1. Descriptive Statistics

Initially, descriptive statistics are calculated to observe the impact of each independent variable on food-taste preference. Overall, approximately only 44.7% of

respondents prefer plain food when it comes to the taste of their main course. It is also evident that a majority of those with no education and those who attended only pre-primary school prefer plain food (56.6% and 55.2%, respectively). Except for respondents with a graduate degree, educated individuals generally prefer tasty food in comparison to their counterparts (primary school: 43.4%, junior high 33.0%, traditional high school 35.1%, vocational high school: 33.9%, vocational 38.7%, and college: 45.8%). In terms of gender, descriptive statistics suggests that 47.5% of women prefer a healthier option (47.5%), whereas only 41.6% of men choose plain as the taste of their main dish. According to the results, roughly 60.7% of individuals who are aware that they have a chronic disease consume mainly plain food. On the other hand, a majority of those without the knowledge that they are chronically ill prefer tasty options (59.4%).

3.2. Logistic Regression Analysis

3.2.1. Model 1

The main objective of the first logistic regression model is to determine the main effect of illness knowledge on food-taste preference. In this model, sociodemographics are included in the model as control variables. The detailed results are shown in Table 3. The intercept is estimated to be statistically insignificant at the $\alpha = 0.05$ level (0.177), which suggests that respondents do not possess a native preference towards food taste. Surprisingly, results show that individuals who know that they have a chronic disease do not refrain from consuming tasty food. This is based on the fact that the parameter estimate for *illness knowledge* is negative and statistically significant at the $\alpha = 0.05$ level (-0.559). Variations in food-taste preference are also observed across individuals belonging to different sociodemographic segments. Men dislike plain food (-0.190) in comparison to their woman counterparts. Moreover, preference towards plain food tends to be more prominent as people become older. Interestingly, education level and preference for plain food are found to be inversely correlated (-0.064). This demonstrates that education is ineffective in encouraging healthy choices.

3.2.2. Model 2

To allow for variations in impacts of *illness knowledge* across segments, Model 1 is extended to contain interaction terms between *illness knowledge* and sociodemographics. The detailed results are in Table 3. Estimating parameters in Model 2 reveal the fact that individuals, in general, dislike food with plain taste. This is evident as the intercept term is found to be negative and statistically significant at the $\alpha = 0.05$ level (-1.088). Similar to previous findings, the men segment exhibits greater preference towards tasty food (-0.150). On the other hand, age is found to have a positive and statistically significant relationship with preference towards food with plain taste (0.026). Education is shown to have a marginal but positive impact on taste preference. More specifically, educated individuals have a slight preference towards plain food in comparison to their uneducated counterparts (0.017).

Table 2. Summary Statistics

Attribute	Range	% Plain	% Other	n
Overall		44.7%	55.3%	63,277
Education				
	No education	56.6%	43.4%	3,652
	Pre-primary school	55.2%	44.8%	15,033
	Primary school	43.4%	56.6%	20,781
	Junior high	33.0%	67.0%	8,741
	Traditional high school	35.1%	64.9%	5,355
	Vocational high school	33.9%	66.1%	1,697
	Vocational	38.7%	61.3%	2,087
	College	45.8%	54.2%	5,113
	Graduate School	51.5%	48.5%	722
Gender				
	Male	41.6%	58.4%	29,869
	Female	47.5%	52.5%	33,408
With chronic disease				
	Yes	60.7%	39.3%	12,909
	No	40.6%	59.4%	50,368

Table 3. Parameter Estimates, Standard Errors, and T-Statistic

Parameters	Model 1 Estimate	Model 1 Std. Err.	Model 1 Wald c2	Model 2 Estimate	Model 2 Std. Err.	Model 2 Wald c2
Intercept	0.177	0.360	24.81	**-1.088**	0.084	168.25
Education	**-0.064**	0.004	222.27	<u>0.017</u>	0.011	2.59
Female	0	N/A	N/A	0	N/A	N/A
Male	**-0.190**	0.016	133.82	**-0.150**	0.038	15.66
Age	**0.009**	0.000	133.82	**0.026**	0.001	515.44
Illness knowledge	**-0.559**	0.023	612.45	**0.865**	0.088	95.66
Illness knowledge*Education				**-0.092**	0.012	62.680
Illness knowledge*Male				-0.056	0.042	1.770
Illness knowledge*Age				**-0.020**	0.001	256.71

Note: Significant coefficients at alpha = 0.05 are in boldface and significant coefficients at alpha = 0.10 are underlined.

In contrast to the results of Model 1, parameter estimate for *illness knowledge* is statistically significant and positive (0.865). This suggests that individuals who are aware that they have a chronic disease will more likely consume main dishes with plain taste. This, however, is not always true. For educated individuals, *illness knowledge* has a less profound effect (-0.092). Moreover, older segments with *illness knowledge* also consume less plain food on average (-0.020). These results confirm that sociodemographic variables significantly have a moderate impact of *illness knowledge* on food-taste preference.

4. Discussion

In line with extant researches, we find that consumers place taste as the key determinant when making food-consumption decisions. This is evident from the estimated intrinsic parameter in the final model. In addition, sociodemographic variables play an important role on food behavior. In comparison to women, men are more susceptible to unhealthy food choices. Fortunately, as consumers get older, they will eventually consume more plain food. More interestingly, knowledge of being ill influences consumers to shift their preference towards a healthier option – food with plain taste. This implies that governments should encourage its citizens to get health check-ups regularly so that they will know of their detrimental health status. However, it is important to note that different segments are not equally affected by illness knowledge. Contrary to common conjectures, educated consumers who know that they are ill will continue to consume tasty food in comparison to their uneducated counterparts. This finding calls into question the effectiveness of marketing programs that focus on the benefits of consuming plain food. This also holds for consumers who belong to the older segment.

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