The Effect of Perceived Susceptibility and Knowledge on Undergraduate Students' Attitude towards Functional Food

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Abstract: In consumers' behavior literature, attitude towards functional foods is an essential factor that affects consumers' acceptance. Functional food companies must ensure that their consumers have a good acceptance of their products. Increasing consumers' acceptance can be done by improving the factors that influence their attitude. This research aims to test the impact of perceived susceptibility and knowledge on undergraduate students' attitude towards functional foods that can prevent hypertension. This research is important since the topic is underdeveloped in the literature. This is a quantitative research using a questionnaire as the survey instrument. The respondents were 59 undergraduate students who enrolled in an executive program that belongs to the department of industrial engineering of a private university in Indonesia. The data went through two-step analyses, which were validity and reliability tests and multiple regressions tests. The results revealed that perceived susceptibility and knowledge positively and significantly affect undergraduate students' attitude towards functional foods that can prevent hypertension.

1   INTRODUCTION

One of the problems faced by Indonesia at this moment is the prevalence of non-communicable diseases (NCD). World Economy Forum (2015) noted that the impact of NCD was significant. For example, the mortality rate caused by NCD has increased by 20.3% between 2004 and 2014 (World Economy Forum, 2015). Furthermore, the World Economy Forum (2015) also revealed that NCD had caused a GDP loss of USD4.47 million between 2012 and 2030. This number is more significant than India (USD4.32 million), even though India's population is five times larger than Indonesia (World Economy Forum, 2015). Therefore, NCD needs to be managed.

One of the solutions for NCD is the consumption of functional food products. The Japanese government was one of the governments that successfully encouraged the consumption of functional food as a part of healthy lifestyle campaigns (Yamada et al., 2008). Until this point, those products were continuously being supported by the Japanese government. They created a relatively lenient regulation, and the sale of functional food products soared to USD8 billion in 2018 (Iwatani & Yamamoto, 2019). Furthermore, Pelletier et al.

(2002) suggested that functional foods should be included as a part of counseling efforts and nutrition education to improve health.

To encourage the consumption of functional food products, consumers' attitude toward functional foods must be positive. According to two theories often used to explain consumers' behaviors, which are the Theory of Planned Behavior (TPB) and the Theory of Reasoned Action (TRA), attitude is an important factor that influences someone's behavior (Ajzen, 1991).

Attitude influences behavior because attitude represents how far someone is willing to accept certain behavior (Küster-Boluda & Vidal-Capilla, 2017). Empirically, studies have found that attitude has a positive effect on the intention to consume certain products (Alam, 2011; Tarkiainen & Sundqvist, 2005), including functional foods (Küster-Boluda & Vidal-Capilla, 2017). Therefore, studies related to factors that affect consumers' attitude toward functional foods become important.

1.1   Previous Research and Research Gaps

Studies that investigated attitude toward functional foods have been conducted. For example, research by

Küster-Boluda and Vidal-Capilla (2017) on 333 functional food consumers in Spain showed that attitude significantly affected willingness to consume functional foods. However, they also found an interesting twist. A healthy lifestyle did not significantly influence attitude toward functional foods. Table 1 shows the examples of previous studies on attitude toward functional foods.

From the narration above, it can be seen that studies related to attitude toward functional food have not investigated the simultaneous effect of perceived susceptibility and knowledge on attitude. These two factors are important and can be reasonably placed as factors that might positively affect attitude toward functional foods since the consumption of functional food is a health-related planned behavior. As a planned behavior, attitude is formed because of someone's belief (Ajzen, 1991). That belief might arise from knowledge obtained by consumers. So, it can be implied that the knowledge of functional foods might affect attitude (Ajzen et al., 2011). On the other hand, as a health-related behavior, perceived susceptibility represents a perception of the threat of diseases. This can be a key variable in determining someone's acceptance of health-related behavior (i.e., consuming functional foods) (Rosenstock, 1974;

Gerend et al., 2004). Perceived susceptibility might affect attitude toward functional foods.

1.2 Research Objective and Hypotheses

This research aims to test the simultaneous effects of perceived susceptibility and functional food knowledge on attitude toward functional foods to fill literature gaps. Specifically, this article intends to:

- Test the effect of perceived susceptibility on attitude toward functional foods
- Test the effect of functional food knowledge on attitude toward functional foods

Align with the previous subsection, the hypotheses of this study are:

- Perceived susceptibility has a positive and statistically significant impact on attitude toward functional foods.
- Functional food knowledge has a positive and statistically significant impact on attitude toward functional foods.

Table 1: Examples of previous research on attitude toward functional food.

Author(s)	Functional Food Type	Sample	Findings
Huang et al. (2019)	General functional food. The respondents were explained about the concept of functional food. Common functional food products in the local market, such as probiotic yogurt, biscuits rich in dietary fiber and energy drink, were given.	1144 Chinese consumers	• Trust in the food system and health consciousness positively a ects purchase attitude. • Food neophobia moderates the relationships between antecedents and them.
Wu et al. (2005)	Soymilk	185 students from a university in northern Louisiana	• Age and race are significantly correlated with attitude • Gender did not have a significant correlation with attitude
Chen (2011)	Cholesterol-lowering spreads, blood pressure-lowering milk drink, probiotic/stomach-friendly yogurt, juice with added calcium, oatmeal with added beta-glucan, snack bars with added fiber, sweets and chewing gums with xylitol, and energy drinks	633 Taiwanese consumers	The attitude was influenced significantly by lifestyle, subjective health complaints, and modern health worries
Devcich et al. (2007)	Yogurt or margarine products either added vitamins or added scientific compounds	390 medical students from The University of Auckland, New Zealand	The attitude was significantly affected by modern health worries
Tudoran et al. (2009)	A processed salmon-based product enriched with dietary wheat fiber	327 Spaniards	The attitude was significantly influenced by health values

2 MATERIALS AND METHODS

2.1 Variables and Indicators

This research has three main variables, which are perceived susceptibility, functional food knowledge, and attitude toward functional foods. Those variables are latent variables, so they need to be measured using indicators. To ensure the content validity, indicators that match with the operational definitions of those three variables were adapted from the previous studies (Buil et al., 2012). Table 2 shows the operational definitions and the indicators used in this research.

Table 2: The operational definitions and statement indicators of research variables.

Variable	Operational Definition	Statement indicators
Attitude toward functional food	Emotion (like/dislike) felt by someone	I like functional foods (X1)
		Functional food is a good food (X2)
		Consuming functional food is beneficial for me (X3)
		It is interesting to consume functional food (X4)
Perceived susceptibility	People's perception related to his or her susceptibility of getting an NCD	I am susceptible to an NCD (X5)
		I worry that I might get an NCD (X6)
		I am afraid of an NCD (X7)
Functional food knowledge	People's ability to identify concepts related to functional foods using information that he or she has obtained before	I have knowledge related to functional foods (X8)
		Compared to my friends, I have more knowledge of functional foods (X9)
		I am sure that I know about functional foods (X10)

In the literature related to knowledge on functional foods, there are two approaches, objective knowledge built through knowledge tests that can be objectively measured and subjective knowledge stemmed from respondents' subjective admissions about their knowledge (Ministry of Health of the Republic of Indonesia, 2018). This research used the second approach because it requires a smaller number of indicators, which would make it easier for respondents. Aside from that, this research will give an initial introduction of functional foods to the respondents before they start filling the questionnaire. If objective knowledge approach was used, the answers might not correctly signify respondents' current knowledge.

2.2 Functional Food Type

There are many types of functional foods. Similar to previous studies that limited the type of functional foods in empirical testing, this research chooses one type of functional food, a type that can potentially prevent hypertension. Functional foods that have this feature include yogurt, dark chocolate, and low-fat milk. This choice was based on two considerations. First, hypertension is an NCD which prevalence has risen in Indonesia (Ministry of Health of the Republic of Indonesia, 2018). Second, research related to consumer behavior that specifically focuses on attitude toward functional foods that can prevent hypertension is still limited.

2.3 Data Collection

Data gathering technique utilized in this study was a survey with a questionnaire as the instrument. The respondents were 59 executive class students in a private university in Indonesia. The number of respondents was deemed adequate for the main analysis technique used in this research, Multiple Regressions Analysis. According to Hair et al. (2006), the technique demands the number of samples to be five times the number of statement indicators. This study used 10 statement indicators (see table 2), so the minimum number of samples needed was 50.

Respondents were recruited in a class in a private university. Their participations were volunteer-based. This was done to avoid bias and ensure that respondents fill the questionnaires based on their actual perceptions. The demographic profile is shown in table 3.

This questionnaire consists of three parts. The first part explained the definition of functional foods that can prevent hypertension and some examples, like yogurt, dark chocolate, and low-fat milk.

The second part probed respondents' demographic profile. The results of those questions are displayed in table 3. The third (main) part of this questionnaire investigated consumers' assessment on perceived susceptibility, functional food knowledge, and attitude toward functional food (see table 2). In

the questionnaire, those indicators were adjusted with the context of functional foods tested in this research. For example, the indicator "I am susceptible to an NCD" was adjusted to "I am susceptible to hypertension." Respondents were required to measure their agreement (or disagreement) level based on their perceptions. The scale used was 1 for 'extremely disagree' to 5 for 'extremely agree'.

Table 3: Demographic profile.

Parameter	Categories	%
Gender	Male	84.2
	Female	15.2
Age	≤ 18 years old	1.8
	19 years old	10.5
	20 years old	24.6
	≥ 21 years old	63,1
Residency status	With family (Father/Mother)	64,9
	Dormitory	28,1
	Other	7,0
Monthly allowance	<IDR600,001	39,3
	IDR600,001-IDR1,200,000	32,1
	>IDR1,200,000	28,6

2.4 Data Analysis

This research employed two-stage data analysis. The first stage was validity and reliability tests for the research instrument. The validity test was done using factor analysis, while the reliability test was conducted using Cronbach's α. The cut-off values are shown in table 4.

Table 4: Criteria for validity and reliability analysis.

Parameter	Criteria	Cut off Values
Instrument reliability	Cronbach's α	≥ 0.6
Instrument validity	Standardized Factor Loading (SFL)	≥ 0.5

Source: Hair et al. (2006), Lai & Chen (2011), Sekaran & Bougie (2010)

The second stage is a multiple-regressions analysis to test the proposed hypotheses. The model-fit analysis was done to assess the overall model (see figure 1). The analysis was done by evaluating the F-value and the significance level. After the model was deemed fit, hypotheses testing was conducted to obtain the β-value and the significance level. The significance level of this study is 10%. Hypotheses were accepted if the β-values were positive and significant at 10% or lower (Hair et al., 2006; Sekaran & Bougie, 2010).
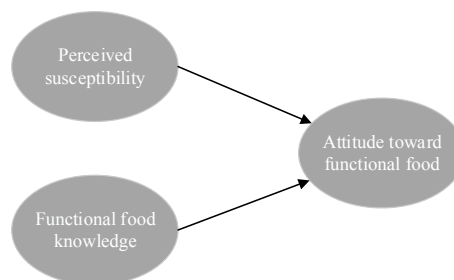

Figure 1: Regression model.

3 RESULTS

3.1 The Validity and Reliability of the Research Instrument

Table 5 shows the results of validity and reliability analysis using factor analysis and Cronbach's α, respectively. Based on table 5, it can be seen that all criteria have been fulfilled. Therefore, the research instrument is deemed valid and reliable.

Table 5: The results of validity and reliability analysis.

Variable	Indicator	SFL	Cronbach's α
Attitude toward functional food	X1	0.807	0.825
	X2	0.738	
	X3	0.891	
	X4	0.806	
Perceived susceptibility	X5	0.847	0.800
	X6	0.895	
	X7	0.793	
Functional food knowledge	X8	0.882	0.885
	X9	0.927	
	X10	0.901	

3.2 The Results of the Multiple-Regressions Analysis

Table 6 depicts the results of the multiple-regressions analysis. Overall, the model is considered fit. Functional food knowledge and perceived susceptibility have positive and significant β-values at 10%. The results indicate that functional food knowledge and perceived susceptibility have positive and significant impacts on attitude toward functional foods. The hypotheses are supported by the data.

Table 6: The results of the multiple-regressions analysis.

Independent Variable	Regression coefficient	Standard error of coefficient	Standardized regression coefficient (beta)	t value	Statistical significance
Intercept	0.003	0.121		0.027	0.978
Perceived susceptibility	0.233	0.128	0.228	1.820	0.075
Functional food knowledge	0.392	0.125	0.394	3.148	0.003
$R^2 = 0.255$					
F value = 8.734					
P level = 0.001					
Dependent Variable: Attitude toward functional food					

4 DISCUSSION

4.1 Theoretical Implication

This research showed that functional food knowledge positively and significantly affected the attitude toward functional foods. This means that the more knowledge, the more likely he or she has a positive attitude and vice versa. This research also found that perceived susceptibility positively and significantly influenced the attitude toward functional foods. It indicated that when someone felt that he or she was susceptible to hypertension, his or her attitude toward functional food would be more positive.

Theoretically, those findings provide new insight into the mechanism of consumers' acceptance. Someone who accepts functional foods is someone who has a positive attitude toward functional foods. A positive attitude can arise from two factors, high knowledge of functional foods and the threat of NCDs.

The results of this research can explain the findings discrepancy between Küster-Boluda and Vidal-Capilla (2017) and Chen (2011). Chen (2011) showed that a healthy lifestyle affected the attitude toward functional foods, while Küster-Boluda and Vidal-Capilla (2017) found otherwise. Someone with a healthy lifestyle does not necessarily have knowledge of functional foods or feels that NCD is a threat for him and that it can be prevented using functional foods. If he does not have a knowledge related to functional foods, he might not know that it can support his healthy lifestyle. Furthermore, someone with a healthy lifestyle might not think that he is susceptible to NCD. This means that he feels like he does not need functional foods, and his attitude toward functional foods will not be positive. That might be the reason why Küster-Boluda and Vidal-Capilla (2017) found that a healthy lifestyle did not

positively correlate with attitude toward functional foods. If someone with a healthy lifestyle also has knowledge about functional foods and realizes their benefits against the risk of NCD, his attitude toward functional foods would be positive as found by Chen (2011).

4.2 Managerial Implication

The result of this research has practical implications for functional food producers and other stakeholders that seek to encourage the consumption of functional foods. First, they need to improve the public's knowledge of functional foods. In this context, the most basic knowledge would be how to identify functional foods and their inherent physiological benefits. This can be done through face-to-face meetings or information technology-based media, like the internet. The benefit of exploiting information technology is its wide and flexible coverage.

Aside from those implications, the research results also encourage stakeholders to increase public awareness of the danger of NCDs that can be alleviated through the consumption of functional foods. Stakeholders can make campaigns on NCDs, the risk factors of NCDs, and NCD's impacts on overall health and well-being. The campaign on NCD prevention is important because as a part of a diet, functional foods serve as a disease-prevention method. Functional foods are not medicines.

The next implication, to ensure consumers' acceptance, functional food companies must develop a specific product that targets certain detrimental effects of NCDs consumers are aware of. With this pattern, the rejection rate might decline.

4.3 Future Issue

Even though this research has generated interesting findings and provided theoretical and practical implications, there are several unfinished issues. First, the main aim of the research on attitude toward functional foods is to find a model that can explain consumers' attitude comprehensively. The regression analysis showed that the R^2 of the model was 25.5%. It means that there were variations of attitude that could not be explained by the variation of knowledge and perceived susceptibility. There must be other variables that can enhance the model's prediction power. Therefore, the variables proposed in this study should be integrated with other variables from different studies that have been empirically proven.

Second, there are various functional foods products available in the market. This poses a question of whether the effect of each variable would be different for other types of food. This research could not answer that particular question because this study only assessed one type of food, which was foods that can prevent hypertension.

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