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Article

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MARKETING | RESEARCH ARTICLE

Consumers' buying intention towards healthy foods during the COVID-19 pandemic in an emerging economy

Syed Shah Alam¹, Cheng-Kun Wang², Chieh-Yu Lin³, Mohammad Masukujjaman⁴ and Yi-Hui Ho^{3*}

Abstract: This study investigates the determinants of buying intention towards healthy foods in Malaysia through a modification of the theory of planned behavior. The moderating role of food safety trust is also analyzed in the study. Drawing on an online questionnaire survey from 375 respondents in Malaysia during the COVID-19 time, the empirical results revealed that food safety concern, health consciousness, nutritional content, attitude, and premium price, significantly affect buying intention. Food safety trust significantly moderates the relationship between buying intention and food safety concern, health consciousness as well as nutritional content. Implications and guidelines are discussed for the policy makers and practitioners. This study developed a model by integrating cognitive product-related factors along with TPB constructs. The findings of this article are of special value for public and private organizations to manage and market healthy foods during the COVID-19 pandemic era.

Subjects: Services Marketing; Marketing Research; Sales; Consumer Behaviour; Marketing Management; RetailMarketing

Keywords: Healthy foods; food safety trust; theory of planned behavior; COVID-19

1. Introduction

There is a proverb that “*Let food be thy medicine and medicine be thy food*”. The thousand-year-old quote acknowledges the importance of healthy eating. A healthy lifestyle with good nutrition is vital for maintaining good health and disease prevention. A healthy diet includes eating and drinking enough of the right foods to provide the body with the nutrients needed to function properly and maintain health as it is intended to do. At this moment of many people falling sick from the COVID-19 pandemic, unhealthy diets contribute to pre-existing conditions that put them more at risk. Pate and Nieuwkoop (2020) highlighted that people with pre-existing, diet-related conditions such as severe obesity, heart disease, and diabetes suffer more severe consequences from COVID-19, including more severe illness and a greater need for intensive health care, such as respirators. While eating healthy foods can be regarded an investment in one's health, making healthy food habits would be important to reduce the chances of getting affected by any viral diseases during the COVID-19 pandemic (Castellini et al., 2021; Park et al., 2022; Rabbi et al., 2021). As a result, it is essential to understand healthy food consumption behavior in the era of COVID-19.

The COVID-19 pandemic has resulted in high mortality rates worldwide. As a result, several impacted countries implemented the movement control order and other forms of mobility restrictions. In addition, the pandemic resulted in the establishment of a “new normal” in society and

industry. The “new normal” context primarily concerns individuals’ health and well-being regarding changes in attitudes and product purchasing decisions, given the necessary adjustments in lifestyle and business practices to prevent infections (Chiu et al., 2022; Latip et al., 2020; Sajed & Amgain, 2020). Due to the newness of the circumstance, it is important to conduct research on a “new normal” following the COVID-19 pandemic. Earlier research on consumer behavior towards healthy foods focused on long-term food consumption and the environmental damage caused by conventional eating (Latip et al., 2020; Maichum et al., 2016). Because of the virus’s ease of transmission through human and surface contact (Sajed & Amgain, 2020) may influence healthy food buying intention based on trust, health, and safety (Sajed & Amgain, 2020). Furthermore, COVID-19 influenced consumers’ judgment and perceptions of healthy food, food safety, and green consumerism (Chiu et al., 2022; Latip et al., 2020; Rabbi et al., 2021).

Coronavirus pandemic has progressed; the way people buy foods has changed (Chiu et al., 2022; Rodrigues et al., 2022). At the beginning of the pandemic, when the understanding of the virus and comprehension of the potential severity was limited, consumers focused on panic buying to mitigate the risk of future shortages (Beard-Knowland, 2020). Most of the foods people buy are non-perishable food items such as pasta, rice, canned goods, flour, and frozen foods throughout the world (Hassen et al., 2020). Baker et al. (2020) indicated that American consumers increased their spending during COVID-19 in an attempt to stockpile needed home goods such as foods.

COVID-19 could also change people’s eating and dietary patterns, leading to a deterioration of nutritional and health status of countrymen (The United Nations System Standing Committee on Nutrition (UNSCN), 2020). Consumers are shifting towards greater consumption of processed food, such as convenience foods, junk foods, snacks, and ready-to-eat cereals (IPES-Food, 2021). Besides, consumers are stocking up on nonperishable items, which mean that they are likely substituting across food categories. Richards and Rickard (2020) indicated that consumers in Canada and the USA have been storing frozen fruits and vegetables, potentially influencing dietary quality. Unhealthy diets are the leading cause of ill-health. Financial hardships, less physical activity, and altered purchasing patterns favoring products with longer shelf lives and often poorer nutrition profiles can lead to higher levels of food insecurity, under nutrition, and overweight/obesity (The United Nations System Standing Committee on Nutrition (UNSCN), 2020). This could be the potential threat of higher chances to get affected on COVID-19. To reduce the chances of getting affected by any viral diseases, making healthy and nutritious food habits is essential. In this study, healthy foods are considered as foods containing no artificial ingredients, preservatives, harmful chemicals, and GMOs (Li & Jaharuddin, 2021). Most consumers believe that healthy foods have higher nutrient levels (Hill & Lynchehaun, 2002). Healthy foods have higher levels of phosphorus, magnesium, iron, and vitamin C and fewer pesticide residues and nitrates than non-organic food (Hsu et al., 2016).

There has been intensive research conducted on healthy food buying behavior during the COVID-19 era in advanced economies like Spain, Italy, Portugal, and Germany (e.g., Alexa et al., 2021; Castellini et al., 2021; Dannenberg et al., 2020) and in some emerging economies such as China, Vietnam, India, Turkey, and Brazil (e.g., Chaturvedi et al., 2021; Güney & Sangün, 2021; S. Li et al., 2021; Qi & Ploeger, 2021; Severo et al., 2021). However, in the Malaysian context, the study is scant (Q. Ali et al., 2021; Latip et al., 2021, 2020) so far found on the healthy foods. Q. Ali et al. (2021) studied the impact of COVID-19 on environmental awareness, sustainable consumption, and social responsibility, which failed to cover comprehensive buying behavior. Thus it is necessary to find the determinants of buying intention towards healthy foods in Malaysian context with a complete framework in the COVID-19 era.

The theory of planned behavior (TPB) has been applied to various research endeavors (e.g., S. Ali et al., 2019; Chen, 2016; Gholamrezai et al., 2021; Hua & Wang, 2019; G. Li et al., 2019; Tan et al., 2017; Yuriev et al., 2020). Despite its widespread acceptability, the primary criticism is that it requires additional variables to enhance its predictive and explanatory value (Davies et al., 2002;

Ertz et al., 2017; Gholamrezai et al., 2021; Zhang et al., 2019). Indeed, some scholars asserted that the TPB paradigm does not adequately account for the diversity of intents (Ajzen, 2002; Rhodes & Courneya, 2003). Additional variables may be incorporated into the TPB if they considerably aid in comprehending behavior (Ajzen, 1991, 2020). Thus, to enhance the TPB's explanatory power, academics have proposed the addition of new relevant variables in the sense that they could theoretically predict intentions (Kaffashi & Shamsudin, 2019; Al Mamun et al., 2018; Sreen et al., 2018; Zhang et al., 2019).

As a result, this study will investigate consumer's buying intention towards healthy foods amid the COVID 19 period using a modification model of the theory of planned behavior. TPB is advantageous for elucidating behavioral intent (Gao et al., 2017; S. Wang et al., 2016; Yadav & Pathak, 2016). In this study, the attitude of the original TPB is kept as a cognitive factor to determine behavioral intention. Moreover, considering the current research context and to better understand consumer's buying intention towards healthy foods, this study incorporates food safety concern, health consciousness, nutritional content, natural content, and premium price in the research framework to establish an extension model of TPB.

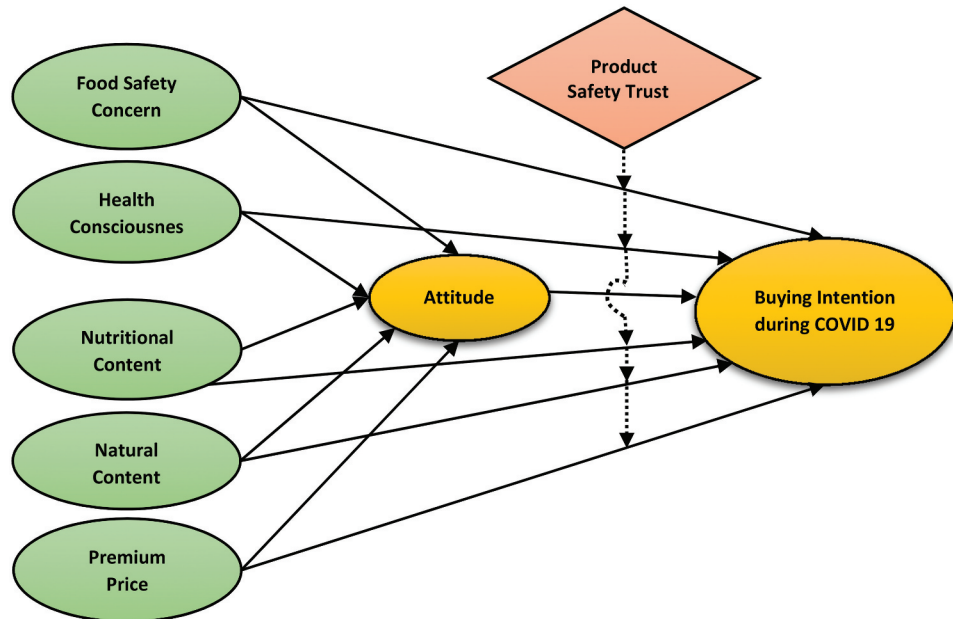
The remaining portion of this paper is arranged as follows. Section 2 presents the conceptual framework proposed for the current study and develops hypotheses to be tested. Section 3 outlines the methodological approach which includes data collection, measurement, and data analysis techniques. Section 4 shows results of data analysis. Section 5 discusses research results, and followed by Section 6 which portrays implications. Section 7 addresses the conclusion and limitations.

2. Hypothesis development

To explore the factors influencing buying intention towards healthy foods during the COVID pandemic, this study will develop the research framework based on a modification of the theory of planned behavior. There are a variety of theories used to explain consumer's behavior in the literature, e.g., theory of reasoned action (Tuhin et al., 2022), technology acceptance model (Safi Sis et al., 2022), stimulus-organism-response model (Chiu et al., 2022), and theory of planned behavior (Gholamrezai et al., 2021). Among these theories, the theory of planned behavior (TPB) has been the most widely used theory in the literature of consumer behavior (Bosnjak et al., 2020). The TPB details the determinants of an individual's decision to conduct a particular behavior and has been successful in predicting a variety of behaviors (e.g., S. Ali et al., 2019; Chen, 2016; Gholamrezai et al., 2021; Hua & Wang, 2019; G. Li et al., 2019; Tan et al., 2017; Yuriev et al., 2020). Hidayat et al. (2021) argued that the TPB is relevant in studying consumer switching behavior relate to healthy food products. As a results, this study will use the concept of TPB to explore consumer's intention towards healthy foods during the COVID pandemic.

The original TPB proposed by Ajzen (1991) assumes that intention is the most important factor influencing an individual's behavior. In the TPB, intention could accurately anticipate behavior when behavior is under one's control (Fishbein & Ajzen, 1980). As a result, if the intention to perform is intense, behavior can be monitored. If certain behaviors excite a person, he or she can make a decision and, ultimately, an intention. The original TPB explains the influences of attitude, subjective norms, and perceived behavior control on the behavioral intention (Ajzen, 1991). Attitude refers to an individual's overall evaluation of the behavior. Subject norms refer to an individual's beliefs about what significant others think he or she should do, and the perceived behavioral control refers to an individual's appraisal his or her ability to undertake the behavior (Ajzen, 1991). In addition to these variables, Ajzen (2020) argued that the TPB can be expanded by adding more predictors of intention or behavior, and accordingly, various extended forms of TPB have been proposed in the literature (e.g., Gholamrezai et al., 2021; Hidayat et al., 2021; Zhang et al., 2019).

Figure 1. Conceptual framework.



In practical, intention can be impacted by various factors, including the product's feature, other buyers' perceptions, and the producing country's perception (C. L. Wang et al., 2012), which typically stems from quality concerns (Sharma, 2011). Because healthy food companies need to understand the influences of consumer's awareness for the healthy food products (e.g., nutritional content, food safety, and price) on consumer's buying intention (Ali & Rahut, 2019; Tran et al., 2020), this study will borrow product-related factors (food safety concern, health consciousness, nutritional content, natural content, and premium price) to modify the TPB. The traditional TPB variables, subject norms and perceived behavioral control, will not be considered in the study because these two variables are not directly related to healthy food products. Figure 1 shows the conceptual framework of the study.

2.1. Food safety concern

Food safety is one of Asians consumer's primary concerns (Latip et al., 2020), and it has a significant impact on consumers' buying decisions in countries where food safety and health are prioritized (Prentice et al., 2019). Furthermore, counterfeiting, adulteration, and food scandals in some Asian countries prompted a desire for more nutritious and safe foods, such as healthy foods (Willer & Lernoud, 2019). Food safety is becoming increasingly important in developing countries, and consumer awareness of food safety information and food demand analysis are strongly linked (Obayelu, 2014). Suh et al. (2012) stated that people are paying more attention to their food's quality, nutrients, and components. Customers will opt for healthy foods when facing pregnancy, illness, food-borne diseases, or other particular conditions (Richter, 2005). The additional aspects of food safety, such as microbiological safety and animal disease-related safety issues, are included in food safety, such as bovine spongiform encephalopathy, foot, and mouth (Honkanen et al., 2006). Although previous studies conducted by Padel and Foster (2005) and Baker et al. (2004) have highlighted food safety as a reason to buy healthy foods, its association with consumers' attitude and intention towards healthy foods has yet to be thoroughly evaluated (Michaelidou & Hassan, 2008). On the other hand, concerns about food safety are the most crucial factor in determining whether or not someone will buy healthy foods (Hsu et al., 2016; Michaelidou & Hassan, 2008). In this study, it is expected that food safety will be a critical factor in determining consumers' attitude towards healthy foods and their willingness to buy the foods, and the following hypotheses are proposed:

H_{1a}: There is a positive relationship between food safety concern and attitude towards healthy foods.

H_{1b}: There is a positive relationship between food safety concern and buying intention towards healthy foods.

2.2. Health consciousness

Healthy product use is regarded as an investment in one's health. Healthy foods are often touted as being healthier than traditional foods. Customers' health consciousness measures their preparedness to make health decisions. The readiness to take healthy actions can be measured by health consciousness (Becker et al., 1977). Findling et al. (2018), Latiff et al. (2016), and Kang et al. (2015) highlighted that health consciousness is often regarded as a significant factor in food quality perception, and it is regularly discussed in conjunction with customers' buying intention towards foods. Consumers with solid health consciousness are motivated to buy healthier food in their daily lives due to attributes found in healthy foods (i.e., no GMO, no harmful chemicals, no preservatives, and no artificial ingredients). Health consciousness is a critical driving factor effectively motivating consumers to purchase healthy foods (Rao et al., 2020; X. Wang et al., 2019). Zagata (2012), and Olivas and Bernabeu (2012) found that health consciousness is the most important determinant in consumer's food buying intention. Consumer's buying intention towards healthy foods can be predicted by consumer's health consciousness (Michaelidou & Hassan, 2008; Xie et al., 2015). Based on the above discussions, this study proposes the following hypotheses:

H_{2a}: There is a positive relationship between health consciousness and attitude towards healthy foods.

H_{2b}: There is a positive relationship between health consciousness and buying intention towards healthy foods.

2.3. Nutritional content

In this research, nutritional content refers to food-related presence of minerals, vitamins, and nutrients. When consumers buy healthy foods, they check the nutritional value in the product labeling. Several studies have highlighted the importance of nutritional content on consumer buying intention towards healthy products. Janssen (2018) and Loebnitz and Aschemann-Witzel (2016) identified nutritional content as one of the predictors of organic food buying intention. The studies conducted by Nguyena et al. (2020), Shahriari et al. (2019), and Curvelo et al. (2019) have discovered that the motivation for buying organic foods is closely linked to the nutritional value perceived by customers. Many consumers believe that organic foods can provide more vitamins, roughage, fiber, and overall nutrition than conventionally produced food, despite the fact that there is no scientific proof that organic foods outperform typical foods in terms of nutritional content. As a result, another crucial cognition included in healthy food buying research is perceived nutrient value, which can drive consumers' desire to purchase healthy foods (Li & Jaharuddin, 2021). Curvelo et al. (2019) found that nutritional content affects consumer attitude and buying intention of organic foods. Therefore, we developed the following hypotheses:

H_{3a}: There is a positive relationship between nutritional content and attitude towards healthy foods.

H_{3b}: There is a positive relationship between nutritional content and buying intention towards healthy foods.

2.4. Natural content

In this study, natural content refers to food that does not have any artificial coloring or food additives added during preserving, processing the raw ingredients' inherent essence, and avoiding

over-processing. Organic food customers are drawn to labels like “pesticide-free,” “hormone-free,” “no chemicals,” “no pollutants,” “no antibiotics,” and “no GMOs”; such foods are thus “natural” (Essoussi & Zahaf, 2009). Consumers who favor organic food over local food usually emphasize animal welfare and natural content (Hasselbach & Roosen, 2015). Chen (2007) found that consumer’s food choice criteria include religion, political beliefs, environmental preservation, animal welfare, natural content, convenience, and mood; all of which influence consumer’s opinions towards healthy foods and, as a result, their buying intention. Furthermore, consumers are ready to pay a premium for natural food brands, prompting producers to include natural content labels on their products (Heeres et al., 2013). According to a survey conducted by Wireless News in 2013, more than 70% of consumers pay extra attention to labels that show things have natural content when purchasing foods and beverages. Hsu et al.’s (2016) study confirmed that natural content has a significant positive effect on attitude, whereas no significant result was found with the relationship between natural content and buying intention. Thus, the following hypotheses are proposed:

H_{4a}: There is a positive relationship between natural content and attitude towards healthy foods.

H_{4b}: There is a positive relationship between natural content and buying intention towards healthy foods.

2.5. Premium price

According to the studies of Kledal et al. (2011), Van Loo et al. (2013), and Zander and Hamm (2010), healthy goods have higher premium prices to compensate for lower levels of production and greater costs. Premium price is also a trusted factor for healthy foods. Zander and Hamm (2010) and Singh and Verma (2017) found that organic food consumers are willing to pay a higher price. Consumers are willing to pay a premium price for organic foods, suggesting positive relationships between knowledge, attitudes, and purchasing frequency (Van Loo et al., 2013). Healthy food production is essential to consumers, and they have a stronger preference for healthy foods (Hempel & Hamm, 2016). Rödiger and Hamm (2015) and Lee and Yun (2015) highlighted that premium pricing affects consumer’s emotion and cognition; premium price of healthy foods affects buying attitudes and makes consumers joyful and thrilled, influencing buying intention positively. A study conducted by T. H. Lee et al. (2020) showed that premium price affects buying attitude towards organic foods. According to the above discussions, the following hypotheses are proposed:

H_{5a}: There is a positive relationship between premium price and attitude towards healthy foods.

H_{5b}: There is a positive relationship between premium price and buying intention towards healthy foods.

2.6. Attitude and intention

Kalafatis et al. (1999) argued that attitude had been found to have substantial correlational links with behavior and behavioral intention in different circumstances, according to the theory of planned behaviour (Ajzen, 1991; Ajzen & Fishbein, 1980). Recent research has looked into the role of attitude in TPB to see if it might predict organic and healthy food buying intention. Several studies have shown that a consumers’ attitude can influence their buying intention, either directly or indirectly through other variables (e.g., food safety, environmental concern, health consciousness, as well as taste; K. H. Lee et al., 2015; Nguyen et al., 2019; Pham et al., 2018). Hsu et al. (2016), Pino et al. (2012), and Kim and Chung (2011) found that attitude can explain buying intention in the context of organic food consumption. Accordingly, this study hypothesizes that:

H₆: There is a positive relationship between attitude and intention towards buying healthy foods.

2.7. Moderating role of food safety trust

The trust factor has become even more crucial with the discovery of food scandals and food safety issues (Latip et al., 2020). Personal trust is critical in boosting knowledge and confidence in consumption of healthy foods. The term “trust” refers to a person’s belief in, expectations, and hopes for a particular product or element (Latip et al., 2020). Consumer trust has been found to influence organic food buying decisions (Sobhanifard, 2018). Sultan et al. (2020) found that consumer trust favorably and dramatically boosted buying behavior and overcame gaps in organic food buying intentions. Despite these studies, there was only minimal information on trust in healthy food safety during the pandemic. It was crucial to determine if trust influenced the relationship between individual concerns and healthy food buying intention. The impact of trust on healthy food safety on customers’ decision-making has to be taken into account (Giampietri et al., 2018). Latip et al.’s (2021) study confirmed that food safety trust could be used as a moderator in the organic food buying context. Consumer’s opinion and anticipation are critical elements in strategic business planning since they can impact consumer’s attitude and buying decision (Periyayya et al., 2016). As a result, the following hypotheses were proposed:

H_{7a}: Food safety trust moderates the relationship between food safety concern and buying intention.

H_{7b}: Food safety trust moderates the relationship between health consciousness and buying intention.

H_{7c}: Food safety trust moderates the relationship between nutritional content and buying intention.

H_{7d}: Food safety trust moderates the relationship between natural content and buying intention.

H_{7e}: Food safety trust moderates the relationship between premium price and buying intention.

3. Research methodology

3.1. Data collection

An online questionnaire survey method was used to collect data from consumers in Malaysia. An online-based survey was used in this study to confirm the respondents’ anonymity and increase the number of responses (Richman et al., 1999). To reduce missing responses, the online questionnaire was developed so that respondents have to answer all questions.

Because it is difficult to reach all healthy-foods consumers in Malaysia, this study employed the virtual snowball sampling process to increase the participants of the online questionnaire survey. Snowball sampling provides a more feasible approach than random sampling when surveying a hard-to-reach population, and allows researchers to reach the potential qualified participants by the distribution of interpersonal relationships. In the initial stage, researchers delivered online questionnaires to randomly sampled participants through their social networks in Malaysia. These sampled participants were also asked to distribute the online questionnaires to other participants in their Malaysian social networks. Although the snowball sampling method is one of the non-probability sampling methods, it is an efficient way to increase the number of respondents, and has been used in several studies about the theory of planned behavior (e.g., Meng & Choi, 2019; Wang & Li, 2022; Yadav & Pathak, 2016).

The data collection continued for two weeks, and 375 respondents were analyzed in the study. For sample size sufficiency, the current study used the G*power program (Faul et al., 2009). According to the criteria proposed by Cohen (1988), for seven independent constructs, the

suggested sample size was 153 ($f^2 = 0.15$ for effect size, $\alpha = .05$ for type I error, and $\beta = 0.20$ for type II error). The majority of the respondents were male (79.5%) and ages between 30–40 years (46.3%) as well as 40–50 years (32%).

3.2. Measurement instruments

The constructs and items were adapted and developed from various past studies, as illustrated in Table 1. The variables of this study were measured by using a 5-point Likert scale ranging from 1 (strongly disagree) to 5 (strongly agree). The items for food safety concern were adapted from Michaelidou and Hassan (2008), whereas health consciousness and buying intention were adapted from Ling and Ang (2018). Constructs of nutritional and natural content were derived from Curvelo et al. (2019), while the premium price was sourced from T. H. Lee et al. (2020). Three items of attitude were adapted from Alam and Sayuti (2011).

3.3. Data analysis method

The data were analyzed using IBM AMOS software version 21 and SPSS 25. The present study tested the hypotheses using a variance-based structural equation modeling (SEM) approach. Following Anderson, and Gerbing's (1988) suggestions, two-phase model evaluations were used, including confirmative factors analysis (to establish the reliability and validity of items and factors) and structural model analysis (to assess the model's fitness and path analysis).

4. Results

4.1. Measurement model

4.1.1. Reliability

Cronbach Alpha (α) value was calculated to test the reliability of the data. As shown in Table 1, for all constructs, reliability coefficients range from 0.793 to 0.923 and are more than 0.7, which adequately highlights reliability suggested by Nunnally and Bernstein (1994).

The constructed questionnaire was also tested with factor analysis. An exploratory factor analysis (EFA) was used in this research because adapted items in the questionnaire development have not been applied in the Malaysian context. To test the suitability of the data for EFA, the sampling adequacies were measured with Kaiser-Meyer-Olkin (KMO). Principle axis factoring was carried out with varimax rotation. KMO values were greater than 0.50 for all individual variables; overall KMO value was 0.93, and Bartlett's test of sphericity was significant ($p < 0.001$). Thus, EFA is appropriate for analyzing the data. The cut-off point for the factor loading value was 0.50 (Hair et al., 2016). In this research, eight factors are loaded with eigenvalue of 1.0 and higher. The total variance explained for eight factors was 71.68%. The results of the factor analysis are shown in Table 1.

4.1.2. Validity and multicollenertity

The assessment of the measurement model was done to estimate the validity of the construct and internal consistency. Construct validity was examined based on the average variance extracted (AVE) and composite reliability (CR). As shown in Table 1, all the constructs have an AVE value higher than 0.5, implying appropriate convergent validity (Barclay et al., 1995; Fornell & Larcker, 1981). In addition, the results shown in Table 2 indicate that this study has appropriate discriminant validity because the value of AVE's square root in the diagonal is higher than other constructs in off-diagonal (Fornell & Larcker, 1981). This study also used the Heterotrait-Monotraits ratio (HTMT) to calculate the discriminant validity of the constructs. The HTMT associated with the disattenuated construct score can test the constructs' connection. As shown in Table 3, it can be concluded that there is appropriate discriminant validity in the study because all values are less than 0.9 (Henseler et al., 2015). The statistical values in Table 2 and Table 3 show that this study fulfilled the requirement for discriminant validity.

Table 1. Factor analysis and reliability test

Determinant Factors	Factor Loading	α	CR	AVE
Food safety concern (Michaelidou & Hassan, 2008)		.808	.810	.587
FS1: Most foods contain residues from chemical sprays and fertilizers during the pandemic due to less monitoring.	.740			
FS2: I am very concerned about the amount of artificial additives and preservatives in food during the pandemic due to less monitoring.	.777			
FS3: The quality and safety of food concern me during the pandemic due to less monitoring.	.781			
Health consciousness (Ling & Ang, 2018)		.850	.855	.666
HC1: I consider myself as health-conscious even during the pandemic.	.692			
HC2: I think it is essential to know well how to eat healthy during the pandemic.	.922			
HC3: I try to consume healthy foods for my long-term health benefits during the pandemic.	.818			

(Continued)

Table 1. (Continued)

Determinant Factors	Factor Loading	α	CR	AVE
Nutritional content (Curvelo et al., 2019)		.880	.884	.717
NC1: Healthy foods have many vitamins and minerals good enough to fight against COVID.	.822			
NC2: Healthy foods keep me healthy good enough to fight against COVID 19.	.851			
NC3: Healthy foods are rich in protein good enough to fight against COVID 19.	.867			
Natural content (Curvelo et al., 2019)		.851	.852	.658
NT1: I perceive healthy foods contain no additives during the pandemic and less monitoring.	.788			
NT2: I perceive healthy foods have natural ingredients during the pandemic and less monitoring.	.843			
NT3: I perceive healthy foods do not have artificial ingredients during the pandemic and less monitoring.	.802			
Premium price (T. H. Lee et al., 2020)		.883	.886	.723
PP1: I believe the price of healthy foods is high during the pandemic.	.768			
PP2: I am willing to pay more during pandemics for healthy foods.	.915			
PP3: I am willing to pay more during pandemics for healthy foods because it is environmentally friendly.	.861			

(Continued)

Determinant Factors	Factor Loading	α	CR	AVE
Attitude (Alam and Sayuti 2011)		.885	.793	.561
AT1: I like the idea of buying healthy foods in the COVID period.	.753			
AT2: I think that buying healthy foods is a good idea in the COVID period.	.751			
AT3: I have a favorable attitude toward buying healthy foods in the COVID period.	.742			
Buying intention (Ling & Ang, 2018)		.923	.875	.638
BI1: In recent months, during pandemics, I have the willingness to buy healthy foods.	.767			
BI2: I will increase the purchase frequency of buying healthy foods during the pandemic.	.839			
BI3: I am willing to buy healthy foods regularly during the pandemic.	.803			
BI4: I will recommend others to buy healthy foods during the pandemic.	.783			
Food safety trust (Canova et al., 2020)		.793	.800	.571
FST1: I perceive healthy foods to be safe and reliable during the pandemic with less monitoring.	.742			
FST2: I trust in healthy foods during the pandemic.	.763			
FST3: I trust in purchasing healthy foods during the pandemic.	.762			

Table 2. Fornell-Larcker correlation matrix and normality data

	FS	HC	NC	NT	PP	AT	BI	FST
Food safety concern (FS)	0.766							
Health consciousness (HC)	.478**	0.816						
Nutritional content (NC)	.685**	.530**	0.847					
Natural content (NT)	.538**	.417**	.662**	0.811				
Premium price (PP)	.625**	.511**	.756**	.660**	0.850			
Attitude (AT)	.664**	.537**	.726**	.703**	.712**	0.749		
Buying intention (BI)	.673**	.558**	.742**	.621**	.734**	.720**	0.799	
Food safety trust (FST)	.361**	.252**	.517**	.443**	.457**	.509**	.396**	0.756
Mean	3.274	3.834	3.345	3.437	3.298	3.395	3.377	3.715
Std. Dev.	.733	.685	.789	.767	.863	.834	.822	.609
Skewness	-.503	-.584	-.386	-.347	-.174	-.343	-.307	-.130
Kurtosis	.002	.565	.004	.077	-.107	-.425	-.237	.001

** . Correlation is significant at the 0.01 level (2-tailed). The bold diagonal values represent the square root of AVE.

Table 3. Heterotrait-Monotrait (HTMT) results

	FS	HC	NC	NT	PP	AT	BI	FST	R ²	VIF	
FS	–								–	2.111	2.075
HC	0.578	–							–	1.534	1.509
NC	0.811	0.612	–						–	4.396	4.374
NT	0.647	0.492	0.762	–					–	2.055	2.182
PP	0.737	0.591	0.757	0.758	–				–	2.910	2.907
AT	0.786	0.618	0.783	0.808	0.812	–			.83	–	4.514
BI	0.776	0.629	0.758	0.698	0.711	0.707	–		.72	3.777	–
FST	0.451	0.309	0.617	0.535	0.545	0.604	0.462	–	–	1.428	1.428

The CR values shown in Table 1 are all higher than 0.7. This indicates a good model and is considered highly acceptable for the early stages of research (Akter et al., 2011). The constructs of this study are considered statistically satisfactory as CR exceeds the cut-off value. In terms of normality, Table 2 shows that the data were normally distributed as the deviation from the average was not an issue (standard deviation is around 1). The value of skewness and kurtosis was less than ± 3 and ± 10 (Kline, 2011).

To examine the multicollinearity among independent variables, the variance inflation factor (VIF) was utilized (Kleinbaum et al., 1988). As shown in Table 3, the multicollinearity statistics results showed that all the VIF values are smaller than 10. This implies that multicollinearity problems did not exist among independent variables (Neter et al., 1996; Ott & Longnecker, 2001).

This study measured the explanatory powers of the model by ascertaining the endogenous variable coefficient of determination (R^2). Cohen (1988) recommended that the value of R^2 of endogenous constructs is significant when the value is 0.26, followed by the value of 0.13 is considered moderate; lastly, if the value 0.02, it is considered weak. As shown in Table 3, every endogenous value found in this research is over the prerequisites in the analysis, which indicates that the model has strong explanatory power (Falk & Miller, 1992).

4.2. Confirmatory factor analysis

Based on the guidelines proposed by Harman (1960), common method bias was tested using Harman's single-factor analysis approach. Through the exploratory factor analysis, the single factor represented 33.5% of the variance in the factors, which is less than the 50% threshold. This affirmed that there was no presence of common method bias in the study.

In the measurement model, we assessed the confirmation of factors using confirmatory factor analysis (CFA). As shown in Table 4, the resulting CFA model produced good fit indices: $\chi^2/df = 2.102$, Goodness of Fit Index (GFI) = 0.921, Tucker-Lewis Index (TLI) = 0.962, IFI = 0.970, comparative fit index (CFI) = 0.970, NFI = 0.940, root mean square error of approximation (RMSEA) = 0.052. The t-values corresponding to all the items were significant at less than 5%.

4.3. Structural modeling

The structural model of this analysis is illustrated in Figure 2 and Table 4. As the calculation was successfully carried out in the CFA test of the measurement model, the validation of the structural model can be used to check the goodness of the fit indices of the proposed model. The SEM outcome shows that the conceptual framework has an excellent data fit ($\chi^2/df = 2.165$). The realized value of RMSEA was 0.060, which justifies the cut-off value of less than 0.08 (Browne & Cudeck, 1992). The other fit indices (CFI, GFI, IFI, and TLI) met the standard of 0.9 and higher (Bagozzi & Yi, 1988).

The AMOS output results (Table 6) show that the relationships among attitude and food safety concern ($\beta = .168$; $t = 3.600$), health consciousness ($\beta = .108$; $t = 2.492$), nutritional content ($\beta = .789$; $t = 13.053$), natural content ($\beta = .328$; $t = 6.778$) as well as premium price ($\beta = .251$; $t = 5.497$) are significantly positive. The results also show that the relationships among buying intention and food safety concern ($\beta = .167$; $t = 7.049$), health consciousness ($\beta = .106$; $t = 2.271$), nutritional content ($\beta = .378$; $t = 2.441$), natural content ($\beta = .378$; $t = 2.441$), premium price ($\beta = .165$; $t = 2.614$) as well as attitude ($\beta = .433$; $t = 2.370$) are significantly positive. However, natural content ($\beta = -.044$; $t = -.587$) did not significantly affect buying intention. Therefore, research hypotheses H_1 , H_2 , H_3 , H_{4a} , H_5 , and H_6 are supported; but the research hypothesis H_{4b} is not supported.

4.4. Moderation analysis

The moderation effect is tested based on the interaction effects of the variables. The results shown in Figure 3 and Table 5 reveal that food safety trust moderates the associations among buying intention and food safety concern ($\beta = .235$, $t = 3.410$, $p < 0.05$), health consciousness ($\beta = .188$, $t = 3.041$, $p < 0.05$) as well as nutritional content ($\beta = .173$, $t = 2.985$, $p < 0.05$). However, food safety trust does not significantly moderate the associations among buying intention and natural content ($\beta = .031$, $t = .980$, $p > 0.05$) as well as premium pricing ($\beta = .022$, $t = .840$, $p < 0.05$). Therefore, hypotheses H_{7a} , H_{7b} and H_{7c} are supported; but hypotheses H_{7d} and H_{7e} are not supported.

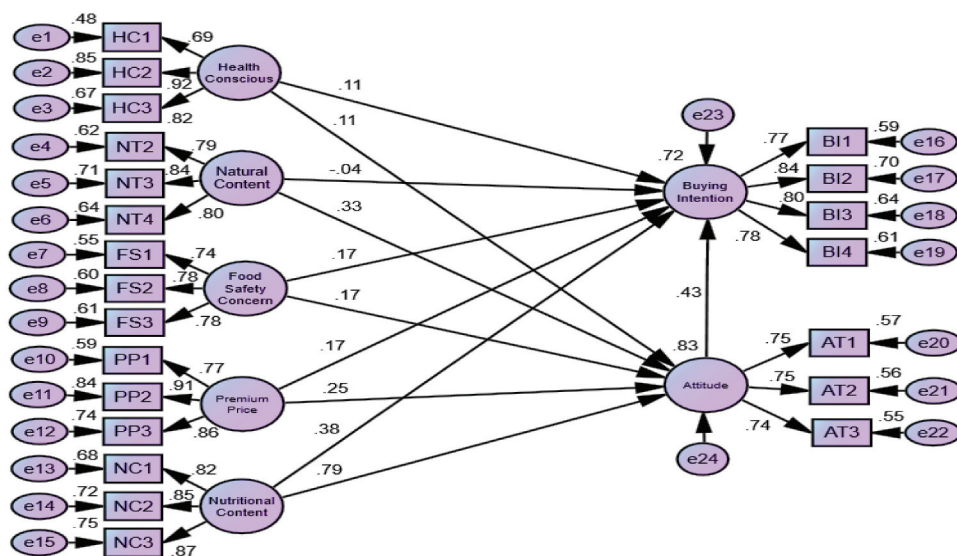
5. Discussions

According to the outcome of data analysis that hypotheses H_{1a} and H_{1b} are supported, food safety concern significantly affects attitude and buying intention towards healthy foods. This result is consistent with the study of Hsu et al. (2016) while opposite to the study of Nagaraj (2021). This signifies that the higher the consumer's food safety concern, the higher the attitude and buying intention towards healthy foods. These results also partially confirm the previous research (Hengboriboon et al., 2020; Michaelidou & Hassan, 2008), which found that food safety concern has a stronger relationship with attitude but did not directly influence buying intention.

Table 4. Results of CFA and structural model with standards

Category	Fit indices	Measurement values for CFA	Meas. values for Structural Model	Standards with Sources	
Parsimonious Fit	χ^2/df	2.102	2.165	<3	Holbert and Stephenson (2002)
Incremental Fit	CFI	0.970	0.962	>0.900	Jöreskog and Sörbom (1993)
	IFI	0.970	0.962	>0.900	Bentler and Bonett (1980)
	TLI	0.962	0.953	≥ 0.90	McDonald and Ho (2002)
	NFI	0.940	0.931	>0.900	Bentler and Bonett (1980)
Absolute Fit	GFI	0.921	0.917	>0.900	Bentler and Bonett (1980)
	AGFI	0.917	0.908	>0.900	Fornell and Larcker (1981)
	SRMR	0.020	0.025	<0.080	Bentler and Bonett (1980)
	RMSEA	0.052	0.060	<0.080	McDonald and Ho (2002), Bagozzi and Yi (1988)

Figure 2. Structural model.



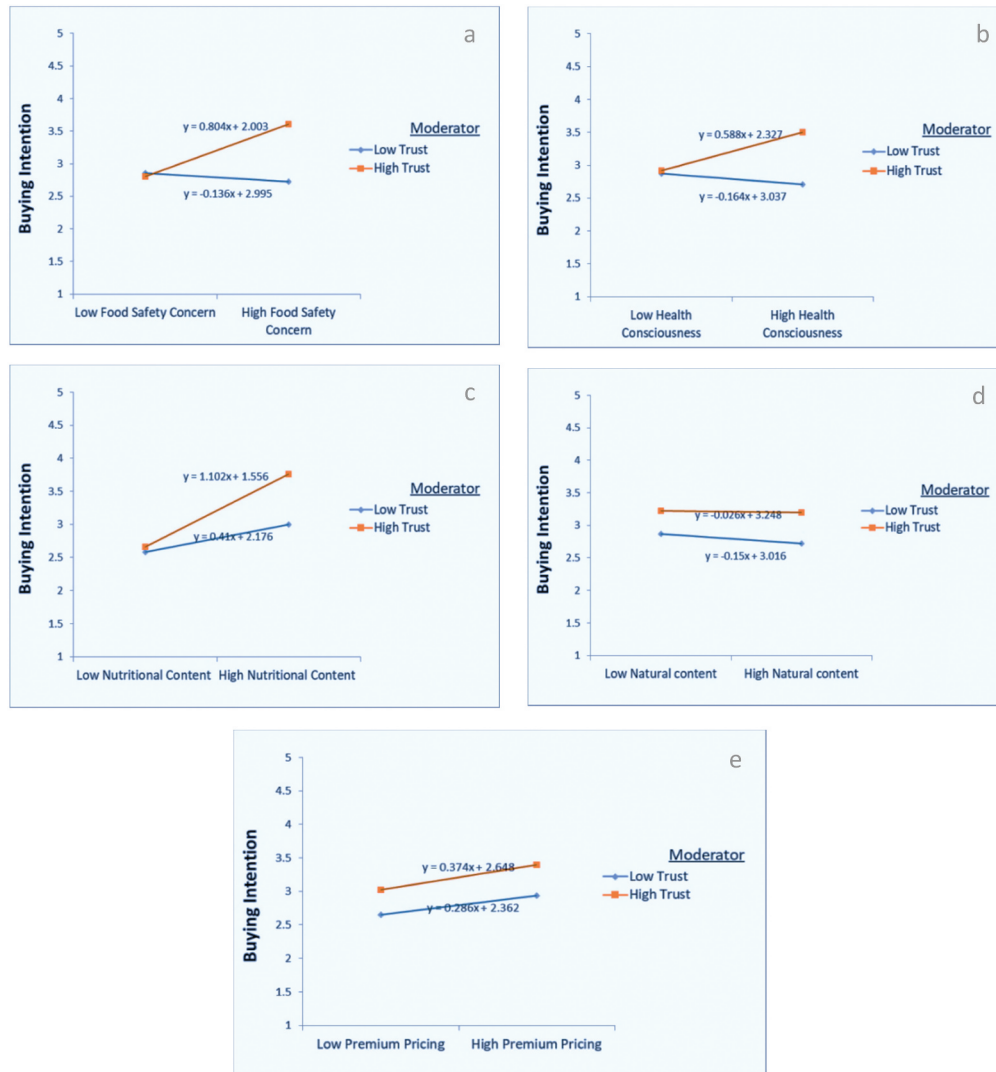
As expected, supported hypotheses H_{2a} and H_{2b} indicate that health consciousness leads to a more favorable attitude and buying intention towards healthy foods which are consistent with some previous studies (Chakrabarti, 2010; Chu, 2018; Prakash et al., 2019; Xu et al., 2019; Yadav & Pathak, 2016). However, this finding is partially in agreement with some prior studies (Hoque et al., 2018; Michaelidou & Hassan, 2008) who found a relationship with attitude but not buying intention. This result implies that when consumers become more health-conscious about healthy foods, they show a more positive attitude and higher buying intention.

Confirming hypotheses H_{3a} and H_{3b} implies that the nutritional content is the determinant of attitude and buying intention towards healthy foods which is consistent with the study of Curvelo et al. (2019). Nutritional content showed the greatest predictability power (79% for attitude and 38% for buying intention) in the structural model (Figure 2). This result stresses that if people feel the higher presence of nutritional content on the products they are buying, they tend to show a more favorable attitude towards the products and ultimately a greater buying intention.

The hypothesis testing results identify that natural content has a significant influence on the attitude towards healthy foods (supported H_{4a}), but not buying intention (non-supported H_{4b}). The results are consistent with prior studies (Ahmad & Thyagaraj, 2015; Chu, 2018; Hartmann & Apaolaza-Ibáñez, 2012; Maichum et al., 2016; Mostafa, 2007; Paul et al., 2016; Zhang et al., 2018) where they identified that natural content has a relationship with attitude but not with buying intention. This connotes that the higher the natural content, the higher the attitude towards healthy foods. But there is no certainty about the buying intention among the consumers for healthy foods. The reason for which people may not be fully convinced to show buying intention might be that they would focus more on the nutritional content of the healthy foods than on the natural content.

Supported hypotheses H_{5a} and H_{5b} denote that premium price significantly affects the attitude and enhances the buying intention towards healthy foods. The result is partially consistent with Kasilingam's (2020) study which found that premium price was positively related to attitude and failed to be related to buying intention. Though the purchasing power is supposed to be decreased during the COVID-19 pandemic, people are still willing to pay for healthy foods with higher price in Malaysia. As predicted, supported hypothesis H_6 confirms that attitude is positively related to buying intention in health food consumption behavior. The result is consistent with several earlier studies (K. H. Lee et al., 2015; Hsu et al., 2016; Kim & Chung, 2011; Nguyen et al., 2019; Pham et al., 2018; Pino et al., 2012).

Figure 3. Interaction of food safety trust: (a) FSC and BI; (b) HC and BI (c); NC and BI; (d) NT and BI; (e) PP and BI.



Regarding the moderating effects of food safety trust, hypotheses H_{7a} , H_{7b} and H_{7c} are supported, but H_{7d} and H_{7e} are not supported. Food safety trust has significantly moderating effects on the relationships between buying intention and food safety concern, health consciousness as well as nutritional content. This means that a person with a greater level of food safety trust holds a stronger conviction to be a food safety-concern and health-conscious person and is thus more inclined to act in a manner with greater buying intention towards healthy foods. Higher nutritional content leads to higher buying intention if the consumer feels higher food safety trust on the healthy foods and vice-versa. purchase intent. However, contrary to the study conducted by Latip et al. (2021), this study found that food safety trust did not moderate the positive association between natural content and premium pricing with buying intention towards healthy foods.

6. Implications

This research offers some vital contributions to the body of knowledge. Firstly, the study displays the buying intention of Malaysian consumers during the COVID-19 pandemic, where we have seen considerable changes in the consumption pattern. The study can enrich academia supplementing future research on buying behavior in any particular economic crisis. Secondly, the study modifies the TPB model with context-specific factors with its original constructs excluding few cognitive

Table 5. Structural model and hypothesis testing results

Hypotheses	STD Beta	STD Error	t-Values	P-Values	Significance (p < 0.05)
H _{1a} : FS → AT	.168	.036	3.600***	.000	Supported
H _{1b} : FS → BI	.167	.050	3.008***	.003	Supported
H _{2a} : HC → AT	.108	.036	2.492**	.013	Supported
H _{2b} : HC → BI	.106	.045	2.271**	.023	Supported
H _{3a} : NC → AT	.789	.042	13.053***	.000	Supported
H _{3b} : NC → BI	.378	.123	2.441**	.015	Supported
H _{4a} : NT → AT	.328	.037	6.778***	.000	Supported
H _{4b} : NT → BI	-.044	.066	-.587	.557	Not Supported
H _{5a} : PP → AT	.251	.032	5.497***	.000	Supported
H _{5b} : PP → BI	.165	.051	2.614***	.009	Supported
H ₆ : AT → BI	.433	.211	2.370**	.018	Supported
H _{7a} : FST*FS → BI	.235	.031	3.410***	.000	Supported
H _{7b} : FST *HC → BI	.188	.043	3.041***	.006	Supported
H _{7c} : FST *NC → BI	.173	.052	2.985**	.009	Supported
H _{7d} : FST *NT → BI	.031	.121	.980	.120	Not Supported
H _{7e} : FST *PP → BI	.022	.14	.840	.160	Not Supported

** Significant at 5% level, *** Significant at 1% level

factors. It integrates the factors like health consciousness, food safety concern, natural content, nutritional content and premium price, which help to enhance the explanatory power of buying intention up to 72%. Thirdly, the current study contributes to theoretically establishing the moderating role of food safety trust in healthy food consumption model. Although previous research has found a link between organic food trust and purchase intention before COVID-19 (Giampietri et al., 2018; Zaidi et al., 2019), nothing was known about the “new normal” after the outbreak. Fourthly, there is debate over price impact on attitude towards the healthy product and its purchase intention. Scholars found that the higher the price of organic food, the lower the purchase attitude and thereby the purchase intention due to the purchasing power of consumers. The present study established that premium price does not negatively affect attitude and intention towards healthy foods, although a pandemic is ongoing. Consumers are ready to pay a premium price for healthy products.

The research also contributes to the policymakers with some practical implications. Firstly, the nutritional content is identified as the significant predictor for both the attitude and buying intention towards healthy foods. If consumers feel they will be benefited from healthy foods in terms of greater nutrition, they are willing to purchase the products. Thereby, the producers and managers should take an awareness program highlighting the nutritional content of healthy foods. The government should also help people being aware of the nutritional values of healthy products by incorporating training or educational programs to people.

Secondly, premium price does not reduce the buying intention towards healthy foods for Malaysian consumers in the pandemic era. The producers and managers could take advantage of this pandemic, stressing the value-added benefits of healthy foods to stay away from the COVID-19. This will boost up their morale for making policy initiatives for rapid diffusion of healthy products. Thirdly, the study found a moderating effect of food safety trust in the path of buying intention. The sudden lockdown has shifted the priority of many governmental and official

activities. This may loosen the monitoring system on the production, processing, and marketing of healthy products, translating into the consumer concern about the product trust. The responsible governmental regulatory agencies should re-energize their monitoring process and publicize the actions taken to restore consumer confidence in the product quality. Even the managers must take this seriously into account and remind the consumers about their ongoing trust-building process through massive online and offline communication media.

7. Conclusion and limitations

The purpose of the study is to investigate the determinants of buying intention towards healthy foods in Malaysia during the COVID-19 pandemic era. The study confirms that food safety concern, health consciousness, nutritional content, premium price and attitude significantly affect consumer's buying intention. Food safety concern, health consciousness, nutritional content, natural content and premium price are found to be significantly related to the attitude towards healthy foods. The results reveal that food safety trust significantly moderates the relationships between buying intention and food safety concerns, health consciousness as well as nutritional content.

In addition to exploring the healthy-food consumption behavior during the COVID-19 pandemic in Malaysian context, this study also contributes to the TPB research. The original TPB assumes that intention is the most important factor influencing an individual's behavior, and explains the influences of attitude, subjective norms, and perceived behavior control on the behavioral intention. Various extended forms of TPB have also been proposed in the literature. This study contributes to the TPB literature by providing evidence that product-related factors (e.g., food safety concern, health consciousness, nutritional content, natural content, and premium price) are also relevant in predicting consumer's attitude and intention, two important variables of the theory of planned behavior.

This study has certain limitations that should be considered in future endeavors utilizing the same constructs in a similar situation. The current study is done from the perspective of Malaysian consumers, and so has a greater expansion potential. As a result, additional research in developing and developed nations utilizing the proposed approach is necessary to validate the results. It can also be replicated in other developing nations to see if the improved explanatory power is an outlier or a result of context changes. In addition, this is a cross-sectional study based on a single survey. Future research can undertake a longitudinal study over a specified period or employ an experimental study approach. Attitude, social norms, perceived behavioral control, and behavioral intention are four primary components of the TPB. This study mainly focused on the effects of product-related factors, and did not consider the effects of social norms and perceived behavioral control. Future research can comprehensively analyze the associations among product-related factors, social norms, perceived behavioral control, attitudes, and buying intention towards healthy foods.

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