Analysis of Factors Influencing Interest in Purchasing Porang Rice Using The Extended Theory of Planned Behavior (E-TPB)

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Abstract

Porang rice, as imitation rice made from porang tubers, can be used as a substitute for white rice because it contains low calories and high fiber. In Indonesia, the marketing of porang rice and related research is still limited. This research aims to determine the characteristics of respondents and the factors that influence interest in buying porang rice, as well as recommendations for marketing strategies based on the research results. Data were analyzed using descriptive statistics, chi-square test, and SEM-PLS. The sample used was selected using a non-probability sampling method using a purposive sampling technique. The number of respondents obtained was 112 respondents. The research results found that the knowledge and status of respondents who were on a calorie diet were the main characteristics of respondents regarding their interest in buying porang rice. Subjective norms and perceived behavioral control directly influence interest in buying porang rice. Product availability indirectly influences interest in buying porang rice through perceived behavioral control. Recommendations for manufacturers' marketing strategies include providing information about low calories and high fiber on their packaging and promotional media, expanding their partner network with retail stores that are frequently visited by the public, and maximizing sales using e-commerce.

Keywords: *marketing, porang rice, purchasing interest, theory of planned behavior*

1. INTRODUCTION

Obesity, or being overweight, is a problem for the world community, including in Indonesia. According to the Ministry of Health of the Republic of Indonesia (Kementerian Kesehatan RI) (2023), there has been a significant increase in obesity, from 10.5% in 2007 to 21.8% in 2018. Obesity is one of the factors causing the emergence of non-communicable diseases that cause other deaths, such as diabetes mellitus, heart disease, cancer, and hypertension. Efforts can be made to reduce the number of obese people in Indonesia by increasing their awareness of following a high-calorie diet.

The habit of consuming high-calorie foods increases the risk of obesity 12.4 times (Putri, 2022). Some high-calorie food products that are often consumed include fried foods, white rice, processed noodles, and sweetened or fizzy drinks. Among these foods, white rice is a staple food for Indonesian people. Many community members assume that they have eaten when they have consumed rice. Statistical data from the Central Statistics Agency (BPS) (2022) states that per capita rice consumption per week from 2019 to 2021 has continuously increased, namely from 1,313 tonnes to 1,451 tonnes. The carbohydrate content of white rice with high levels of consumption can increase obesity and the risk of diabetes mellitus in countries where white rice is consumed as a staple food (Bhavadharini et al., 2020). So, a calorie diet that replaces carbohydrates in white rice as a staple food with other products high in fiber and low in calories can also be implemented in Indonesia.

Artificial rice can be an alternative to white rice for staple foods because its texture and taste are almost similar. A nearly identical texture can provide an excellent response to food substitutes in consumers because texture dramatically influences the taste of food when chewed in their mouth (Setiawan et al., 2021). Apart from that, artificial rice diversifies rice to strengthen Indonesian food security.

Artificial rice can be an alternative to white rice or porang rice. Porang flour comes from processed porang tubers, which contain low fat, high fiber, and protein (Mahirdini and Afifah, 2016), so it can be used as a substitute for white rice. The main ingredient in porang flour is glucomannan,

which has various benefits, such as reducing blood cholesterol obesity, treating chronic constipation, preventing and inhibiting cancer, and lowering blood glucose (Supriati, 2016; Setyono et al., 2021).

The glucomannan contained in porang rice helps reduce blood cholesterol, reduce obesity, treat chronic constipation, prevent and inhibit cancer, and lowering blood glucose (Supriati, 2016; Li et al., 2019; Setyono et al., 2021; Faizal et al., 2022). In the Fukumi brand of porang rice, it was found that the calories of porang rice per 100g were worth 70 kcal. Where the calorific value, when compared with white rice, red rice, and other analogous rice such as Smart rice, Gayong, Siger, Rasbi (sweet potato rice), and rasi (cassava rice), has the lowest value (Table 1).

Table 1. Calorie Value per 100g of rice

Types of Rice	Calorie (kcal)
White rice	180
Brown rice	149
Smart rice	350
Gayong rice	364
Siger rice	344
Rasbi (sweet potato rice)	394
Rasi (cassava rice)	350
Porang rice (Fukumi)*	70

Source: Indonesian Food Composition Table 2017 (Ministry of Health, 2018); *Sucofindo Laboratory Test Results (www.fukumi.co.id, 2021)

The porang rice industry in Indonesia has become known to the general public in recent years. The pioneer of the porang rice industry is PT. Ambitious Trading Company (PT. Ambico) and several industries have mass-produced and marketed porang rice, such as PT. Asia Prima Konjac (Fukumi) and CV. Bali Yuan Organic. Porang rice is produced by mixing several components as complementary ingredients, such as water and rice flour, starch, or shellfish flour, with each brand composition varying. This research focused on porang rice products with a composition of porang flour (48-50%), rice flour and water.

As a product that has only just become known to the public, the marketing of porang rice is still relatively limited. Porang rice is still not known throughout Indonesia. According to search data on Google Trend (2023), Indonesian people who are familiar with porang rice are predominantly from the islands of Java and Bali. Previous research was about the behavior of shirataki rice consumers (Case Study in Malang City) by Gillandtama et al, 2022. In this research, the respondents were only limited to Malang City so the results of the research only presented consumers in the Malang City area. There is another study with the same raw materials but the products used are different, namely interest in buying shiradek noodles by Divayana et al, 2022. Knowledge regarding the factors that influence the formation of interest in buying porang rice is necessary because it can help the porang rice industry prepare marketing strategies that align with consumer desires (Morwitz et al., 2007).

Research Purposes: 1) Describe consumer characteristics influencing interest in purchasing porang rice. 2) Analyze the factors from the Extended Theory of Planned Behavior (E-TPB) that influence consumer buying interest in porang rice. 3) Provide recommendation notes for marketing strategies based on objectives 1 and 2.

2. MATERIAL AND METHODS
2.1 Research Time and Sampling

This research was carried out in July - November 2023. The respondent sample was determined using purposive sampling, a technique with specific criteria adapted to research needs (Sugiyono, 2013). The requirements for respondents in the sample were Indonesian citizenship, having knowledge about porang rice, experiencing a decline in health (obesity, diabetes mellitus, hypertension, or stroke), being on a high-calorie diet, and/or having consumed porang rice and being willing to fill out a questionnaire. The minimum number of respondents is 100 (Lemeshow and David, 1997).

2.2 Data collection

The primary and secondary data used in this research are primary and secondary. Secondary data was collected from literature studies sourced from books and information from journals related to the topic of discussion. Primary data was collected using an online survey via a Google form questionnaire (tinyurl.com/KuesionerBerasPorang).

The questionnaire contains questions about respondent characteristics and variable indicators prepared in a research hypothesis scheme (Figure 1.) The scheme is prepared based on the TPB concept, namely attitudes towards behavior (SP), subjective norms (NS), and perceived behavior control (PC) variables which can influence the purchase intention (MB) variable (Ajzen, 2005), which was expanded with the addition of health awareness (KS) and product availability (KP) variables (Divayana et al., 2022). The respondents' answers were assessed using 4 Likert scales, namely 1=strongly disagree, 2=disagree, 3=agree, and 4=strongly agree.

Data was collected from the accounts of researchers and fellow researchers by distributing questionnaires using social media, including WhatsApp, Instagram, TikTok, and X/Twitter. Through this media, data was collected from 112 respondents who had filled out the questionnaire, with 66 respondents having ever consumed porang rice and 46 people who had never consumed porang rice. All respondents obtained good knowledge about porang rice.
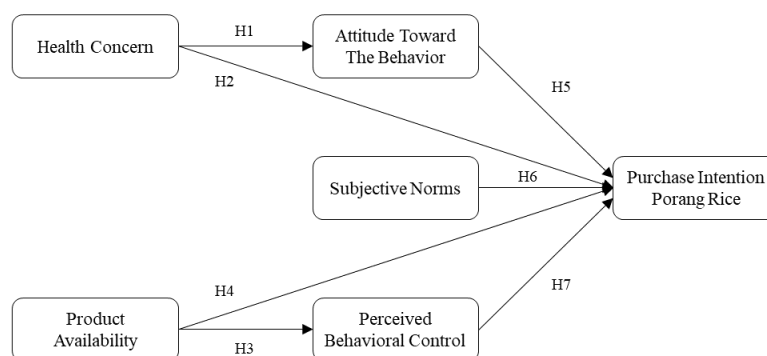

Figure 1. Research Hypothesis Scheme

2.3 Data Analysis

The collected data was then analyzed using descriptive statistics, cross-tabulation Chi-Square test analysis, and Partial least square Structural equation modeling (SEM-PLS) analysis. Descriptive statistics are used to describe the respondent's character. Cross-tabulation Chi-Square test analysis was used to see the significant relationship between respondent characteristics and interest in buying porang rice. SEM-PLS analysis is used to analyze factors influencing purchasing interest based on E-TPB.

2.4 Chi-Square Cross tabulation

Cross-tabulation analysis is a relatively simple analytical method that can explain the relationship between variables. The cross-tabulation analysis used Chi-Square statistical analysis to describe the significance level of the relationship between variables (Sugiyono, 2013). In this study, the cross-tabulation chi-square test was carried out with the help of SPSS 25 software. The two variables have a significant relationship when the Asymp Sig (2-sided) value is more than 0.05 (Priyono, 2008).

2.5 SEM-PLS

E-TPB variables (attitudes towards behavior, subjective norms, perceived behavioral control, health awareness, and product availability) on interest in buying porang rice were analyzed using SEM-PLS with SmartPLS 4.0 software. The benefit of using SmartPLS 4.0 software is its ability to analyze data in small amounts (112) and does not require normally distributed data in the data analysis process

(Supriadi, 2022). The data analysis process was carried out in two stages: evaluation of the measurement model and assessment of the structural model.

2.5.1 Third-Level Heading Evaluation of the Measurement Model/Outer Model

Measurement model evaluation is used to evaluate the validity and reliability of the data used for analysis. The assessment was carried out using three tests: convergent validity, discriminant validity, and reliability (Ghozali, 2006). The measurement model can be seen in Table 2.

Table 2. Measurement model evaluation (Ghozali, 2006)

Evaluation	Parameter
Reliability	Composite reliability value > 0.70
Convergent Validity	Loading factor value > 0.60
	Average variance extracted (AVE) value > 0.50
Discriminant Validity	Fornell Larcker value: Square root AVE > correlation value between latent constructs Cross loading value: Correlation of indicators with their constructs > correlation between indicators and other constructs

2.5.2 Evaluation of the Structural Model/Inner Model

Structural model evaluation is used to analyze the relationships between variables. Evaluation is carried out by looking at the value of R^2 (*explained variance*) to measure the level of relationship between exogenous variables and endogenous variables. The Q^2 (*predictive relevance*) value is to see how well the model makes observations. The f^2 (effect size) value is used to know the variable's influence level at the structural level. The value of f^2 is equal to 0.02; 0.15; and 0.35 can be interpreted respectively that the latent variable predictor has a small, medium, and large influence structurally. The path coefficient value is used to see the level of influence between variables in one path, and the t-statistic test evaluates the hypothesis acceptance. The path coefficient value between -1 and 0 means that the exponential variable has a negative influence on the endogenous variable or has the opposite influence. A value between 0 and 1 means that the exogenous variable has a positive influence on the endogenous variable (Ghozali, 2006).

3. RESULTS AND DISCUSSION

3.1 Characteristics That Influence Interest in Buying Porang Rice

The relationship between respondent characteristics and interest in buying porang rice was analyzed using a cross-tabulation chi-square test using SPSS 25 software. The results of the analysis can be seen in Table 3. Based on these results, the respondents' knowledge and current condition are the characteristics that significantly influence their interest in buying porang rice, which is suitable for a calorie diet. Based on respondents' knowledge of porang rice, it was found that their knowledge of porang rice consistently influenced their interest in giving porang rice. Based on the health condition of the respondents, it was found that the condition of the respondents who were on a calorie diet significantly influenced their interest in buying porang rice. Meanwhile, the characteristics of respondents based on demographics were not significantly related to interest in buying porang rice. It is different from similar research conducted by Divayana et al. (2022) on Shirataki Instant Noodles, who found that demographics influenced purchasing interest through TPB variables, namely gender, income, and age, but did not influence overall.

Table 3. Cross-tabulation chi-square test results of respondent characteristics with buying interest

Respondent Characteristics		Asymp Sig (2-sided)		
		MB1	MB2	MB3
Sociodemographic	Gender	0.139	0.084	0.262
	Age	0.892	0.262	0.629
	Domicile	0.540	0.219	0.724
	Education	0.727	0.705	0.982
	Occupation	0.925	0.263	0.791
	Income	0.516	0.791	0.221
Health Status	Diabetes	0.062	0.076	0.145
	Hypercholesterol	0.945	0.815	0.510
	Coronary heart	0.645	0.267	0.755
	Obesity	0.422	0.506	0.718
	Chronic constipation	0.819	0.601	0.811
	Cancer	-	-	-
	Calorie diet	0.044**	0.544	0.245
Knowledge		0.872	0.387	0.036**

** Significance at α=5%

3.2 Factors of Interest in Buying Porang Rice Based on Extended Theory of Planned Behavior (E-TPB) Variables

The results of the measurement model evaluation show that the data used has a loading factor value for all variables > 0.60 and an AVE value > 0.50, so the data is convergently valid. The cross-loading value and Fornell Larcker value for all pairs of indicators are higher than the correlation value between other indicators, so the data is said to be discriminant valid. The composite reliability value obtained is > 0.70, so the data is reliable. The results of the R^2 test (Table 4) show that health awareness, product availability, attitudes towards behavior, subjective norms and perceived behavioral control can explain the purchase interest variable by 57.8%. The product availability variable can explain the perception of the behavior control variable by 36%. The health awareness variable can explain the attitude towards behavior variable by 43.1%. The Q^2 test results (Table 4) show that all endogenous variables (MB, PC, and SP) have a value of more than 0. The Q2 value explains that the model has good predictive relevance (Ghozali, 2006). So, the exogenous variables can be good at predicting endogenous variables.

Table 4. R^2 and Q^2 Values

Variable Exogen	Variable Endogen	R^2 Value	Q^2 Value
Health Awareness			
Product Availability			
Attitudes Towards Behavior	Purchase Interest	0.578	0.310
Subjective Norms			
Perceived Behavioral Control			
Product Availability	Perceived Behavioral Control	0.360	0.333
Health Awareness	Attitude Toward	0.431	0.404

The results of the f2 test (Table 5.) show that product availability and health awareness do not influence structural purchase intention. Subjective norms and attitudes towards behavior weakly influence purchase intention structurally. Product availability on perceived behavioral control, health

awareness on attitudes towards behavior, and perceived behavioral control on purchase intention have a solid structural influence.

The t-statistic test (Table 6) shows that three hypotheses are rejected, namely H2, H4, and H5. So, based on the t-test, it can be said that health awareness influences attitudes toward behavior, product availability influences perceived behavioral control, and subjective norms and perceived behavioral control directly influence interest in buying porang rice. Meanwhile, health awareness, product availability, and attitudes toward behavior do not directly influence interest in buying porang rice. However, regarding the product availability variable, it can be said that it indirectly influences the interest in buying porang rice through a behavioral control process. These findings can be seen from the path that the variable product availability influences perceived behavioral control, then perceived behavioral control influences interest in buying porang rice (Figure 2.). This finding aligns with research from Lwin et al. (2020) and Divayana et al. (2022), which states that product availability indirectly influences purchase intention for functional foods through perceived behavioral control.

The path coefficient value (Table 4) (Figure 2) obtained is above 0 for all paths, meaning all paths have a positive relationship. A positive relationship means that every time the value of the exogenous variable increases, the value of the endogenous variable will also increase. Based on the path coefficient value, it was also found that the highest value was found in the behavioral control perception variable path, which influenced interest in buying porang rice with a value of 0.544. So, it can be concluded that perceived behavioral control influences the intention to purchase porang rice more than subjective norms. The perceived behavioral control variable path is also influenced by product availability with a path coefficient value of 0.600.

Based on the loading factor value (Figure 2), the indicator with the most influence on the latent variable can be found. The indicator with the most significant loading factor value means that the indicator is the factor that has the most impact on the formation of the latent variable. The product availability variable has the most significant loading factor value on the KP3 indicator (I can quickly get porang rice at my regular shop) of 0.805. It means that product availability in consumers' regular shops is an essential factor in the product availability variable that influences interest in buying porang rice. The behavioral control perception variable has the most significant loading factor value in the PC2 indicator (I am willing to purchase porang rice if the resources (time & costs) are available) of 0.849. That means that the availability of time and costs have a significant influence on controlling consumer behavior and interest in purchasing porang rice. The purchase interest variable has the most considerable loading factor value on the MB3 indicator (I am consistently interested in buying porang rice) of 0.915. The consistency of interest in purchasing porang rice is the most significant factor in forming interest in purchasing porang rice.

Table 5. value of effect size (f^2) dan *Path Coefficient*

Path	Value f^2	*Path Coefficient* Value
KP ▢ PC	0.563	0.600
KP ▢ MB	0.001	0.023
KS ▢ SP	0.758	0.657
KS ▢ MB	0.005	0.062
NS ▢ MB	0.037	0.140
PC ▢ MB	0.358	0.544
SP ▢ MB	0.027	0.156

Table 6. Results of Bootstrapping Testing and Hypothesis Testing

Hypothesis	*t-statistics*	Acceptance of Hypothesis Testing
H1: KS ⯈ SP	14.076	Accepted
H2: KS ⯈ MB	0.750	Rejected *
H3: KP ⯈ PC	9.306	Accepted
H4: KP ⯈ MB	0.269	Rejected *
H5: SP ⯈ MB	1.705	Rejected *
H6: NS ⯈ MB	2.062	Accepted
H7: PC ⯈ MB	5.289	Accepted

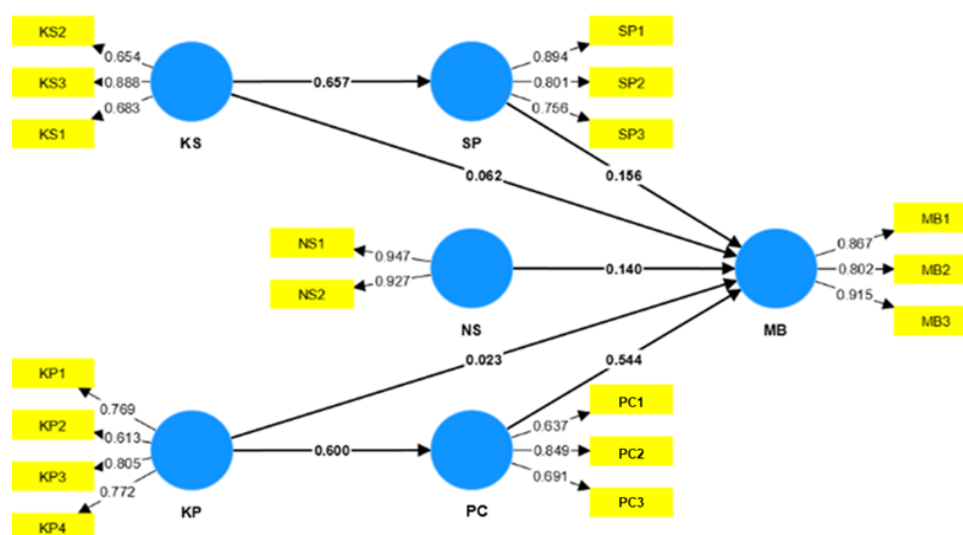*Requirements for accepting the hypothesis are >1.96

Figure 2. Final model analysis results

3.3 Recommendations For Marketing Strategy

The following recommendations can be considered to assist in developing a marketing strategy for porang rice. (1) Based on the relationship between respondent characteristics and interest in buying porang rice, it is known that the knowledge and status of respondents who are on a calorie diet have a significant relationship with interest in buying porang rice. Therefore, producers can add more information about the content and benefits of porang rice on the packaging or in product advertisements, such as adding information about claims of low calorie and high fiber content based on laboratory test results on the packaging. (2) Based on the variable analysis, the availability of porang rice products at consumers' regular shops is an important factor in buying interest in porang rice through perceived behavioral control. Therefore, producers can expand their partner network with retail stores that are frequently visited by the public, such as national minimarkets and supermarkets such as Alfamart, Indomaret, Superindo, and others or local ones such as Gading Mas, Mirota, and Pamela in Yogyakarta, Golden supermarkets and Dynasty supermarkets in Kediri, as well as local minimarkets and supermarkets in other areas. (3) Based on the behavioral control perception variable, the availability of respondents' resources such as time and costs are important factors, so business actors can pay attention to prices and easy access to purchasing porang rice. Therefore, producers can maximize sales using e-commerce because purchasing using e-commerce according to the public saves more time and costs than offline purchases.

4. CONCLUSIONS

The demographic characteristics of respondents do not have a significant relationship with interest in buying porang rice. Respondents' knowledge of porang rice and the status of respondents on a calorie diet have a substantial relationship with their interest in purchasing porang rice.

Based on the Extended Theory of Planned Behavior (E-TPB), subjective norms and perceived behavioral control directly influence interest in buying porang rice. The product availability variable indirectly influences the interest in buying porang rice through the perception and behavior control variable. The variable influencing the intention to purchase porang rice is perceived behavioral control with a t-statistic value of $5.227 > 1.96$.

Recommendations for marketing strategies based on the results of this research provide information on the content and benefits of porang rice in packaging or in product advertisements, such as adding information about claims of low calorie and high fiber content based on laboratory test results on the packaging. Apart from that, producers can expand their partner network with retail stores frequently visited by the public, such as national and local minimarkets or supermarkets, and maximize sales using e-commerce.

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