

# Relationships among behavioral beliefs, past behaviors, attitudes and behavioral intentions toward healthy menu selection

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**BACKGROUND/OBJECTIVES:** Obesity is a serious concern worldwide, for which the restaurant industry holds partial responsibility. This study was conducted to estimate restaurant consumers' intention to select healthy menu items and to examine the relationships among behavioral beliefs, past behaviors, attitudes and behavioral intentions, which are known to be major determinants of consumer behaviors.

**SUBJECTS/METHODS:** An online, self-administered survey was distributed for data collection. The study sample consisted of customers who reported having visited casual dining restaurants in the last three months at the time of the survey. Structural equation modeling was used to verify the fit of the proposed research model.

**RESULTS:** Structural equation modeling revealed that the proposed model supports the sequential, mediated (indirect) relationships among behavioral beliefs, past behaviors, attitudes and behavioral intentions toward healthy menu selection.

**CONCLUSION:** This study contributes to the available literature regarding obesity by adding past behaviors, one of the most influential variables involved in prediction of future behaviors of consumers, to the TPB model, enabling a better understanding of restaurant consumers' rational decision process regarding healthy menu choices. The results of this study provide practical implications for restaurant practitioners and government agencies regarding ways to promote healthy menus.

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## INTRODUCTION

Obesity is a major contributor to chronic health problems such as heart disease, diabetes, and cancer, resulting in enormous socioeconomic costs worldwide. According to the Korea Centers for Disease Control and Prevention [1], the obese proportion of the population among adults over the age 19 in Korea was 34.8% (42.3% for males and 26.4% for females) in 2016. Worldwide, 1.9 billion adults over the age 18 were overweight in 2016, of which 6.5 million were obese [2]. Overall, about 13% of the world's adult population in 2014 was obese [2], which accounted for 20% of global health care costs and 2.8% of the global Gross Domestic Product in 2012 [3].

Eating out at restaurants has been identified as one of the major causes of obesity worldwide because restaurants tend to provide high-calorie diets and nutritionally unbalanced foods [3]. It is generally well known that meals sold at restaurants are high in calories, fat, saturated fats, salt and cholesterol, and low in fiber, calcium, and iron than meals cooked at home [3,4]. In South Korea, the restaurant industry has expanded in response to rapid economic growth, resulting in the frequency of eating out increasing, and consumers' eating habits changing.

Indeed, the percentage of people who eat out more than once a day in Korea increased from 24.2% in 2008 to 34.0% in 2016 [1], and the annual average transactions within the foodservice industry also steadily increased by 2.9% from 2011 to 2016 (average annual growth rate calculated from Euromonitor International statistical data) [5]. Moreover, the obesity prevalence rate in South Korea is also increasing, growing 2.6% annually on average from 1998 to 2016 [1]. The growth of the restaurant industry and the increasing rate of obesity are highly correlated, and scholars, policymakers, and marketers are carefully considering this situation [6].

In an attempt to provide control measures for increasing obesity, some studies have focused on the psychological aspects of restaurant consumers behind healthy menu selection. Emphasis has been placed on the psychological aspects given that understanding consumers' decision-making processes when selecting healthy meals allows policymakers and marketers to predict their behavioral patterns better. These studies have incorporated the use of theoretical models derived from psychology, such as the value-attitude-behavior (VAB) model [7], health belief model [8-9], dual-phase model [10] and the theory of planned behavior (TPB) model [11-20]. For example,

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Kang *et al.* [7] used the VAB model to identify how personal health values affect interest, outcome expectations and behavioral intentions toward healthy menu choices. Jeong & Ham [8] examined the relationship between health beliefs and the use of nutrition information labeling to select healthy menu items. Moreover, Amrein *et al.* [9] explained the role of compensatory health beliefs for two eating behaviors (increase in fruit intake and decrease in unhealthy snack intake) by incorporating quantitative and content analysis. Hagger *et al.* [10] explored how the dual-phase model, which explains the decision process of consumers as rational and impulsive, can explain sugar consumption behavior.

Among the many theoretical models in psychology, the TPB is the most widely used to predict future behaviors [11-20]. The TPB has also been considered to be effective at explaining health related behaviors [16-17] and restaurant consumers' healthy menu choices [18-20]. For example, Kim *et al.* [17] explained restaurant consumers' behavioral intentions toward the use of menu labeling with variables from the TPB. Moreover, Jun & Arendt [18] used four TPB variables and two additional variables (prototype image and willingness) to illustrate restaurant consumers' healthy menu choices. Shin *et al.* [19] investigated the intention of consumers by using the TPB and additional variables (e.g., awareness of consequences and ascription of responsibility). Seo *et al.* [20] applied the TPB to explain fast food consumption by teenagers living in Seoul. To explore the possible decision-making processes behind restaurant consumers' healthy menu choices, this study examined the major determinants of behavioral intention by adopting some of the main variables from the TPB, given its robustness in explaining consumer behaviors and health-related behaviors.

According to the TPB, the prime factor in the model is one's intention to perform a certain behavior, which is reflected as behavioral intentions within the TPB model [13,14]. Behavioral intentions are defined as an indication of how much an individual is willing to try something [22-24]. The direct determinant of behavioral intentions explained by the TPB is the attitude toward the behavior. Attitudes are defined as the degree to which an individual assesses or evaluates a particular behavior favorably or unfavorably [14,25]. That is, attitudes reflect one's emotional state toward the targeted behavior and have a strong impact on their motivational state to perform a specific action, leading to behavioral intention [14,25]. Attitudes not only work as a strong antecedent to behavioral intentions, but also mediate the effect of other factors impact on the intention [13]. Positioned as an immediate precursor to attitudes, behavioral beliefs represent one's perceived beliefs regarding the possible outcome of a behavior [14]. That is, this belief represents how a person perceives that their action regarding something will bring about a certain result [15]. Past behaviors are another variable that increase the predictive power of future actions [12]. This variable accounts for the repeated performance of consumers and its role has especially highlighted for its effectiveness in anticipating consumer behaviors regarding frequently repeated purchases [12,26-28]. Because dining-out activities are conducted on a repetitive basis, the present study added past behaviors to provide better insights into healthy menu selection.

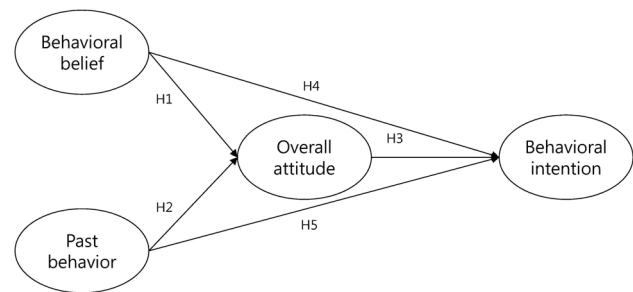


Fig 1. Conceptual framework of the study

While both behavioral beliefs and past behaviors can influence consumers' healthy menu choices, previous studies have mostly neglected the role of past behaviors. Menu choice is a repetitive action that emphasizes the role of past behavior. Therefore, it is important to estimate the previous efforts that consumers have made when selecting healthy menu items.

This study was conducted to examine the role of behavioral beliefs, past behaviors and attitudes in behavioral intentions. Based on previous literature, the main variables are expected to have relationships as depicted in Fig. 1. The hypotheses proposed in this study are as follows (Fig. 1).

H1: consumers' behavioral beliefs have a positive effect on their attitudes toward the healthy menu selection

H2: consumers' past behaviors regarding healthy menu selection have a positive effect on their attitudes toward healthy menu selection

H3: consumers' attitudes toward healthy menu selection have a positive effect on behavioral intentions.

H4: consumers' behavioral beliefs have a positive impact on behavioral intentions.

H5: consumers' past behaviors regarding healthy menu selection have a positive effect on behavioral intentions.

## SUBJECTS AND METHODS

### Data collection

The participants were comprised of consumers over age 20 who reported visiting a foodservice or a restaurant within the three months prior to the survey period. Data were collected during the 2nd week of October 2015 through a self-administered online survey by a research company, Macromill Embrain, that holds nearly 200,000 consumer panels. During sample recruiting, we applied the quota sampling method so the sample population would reflect the demographic ratio of the restaurant population living in South Korea. Previous studies of foodservice and restaurant consumers also supported use of quota sampling method, applying the same proportion of the census figures of the national restaurant customers, for instance, age and gender, to survey sampling [e.g., 29,30]. While the survey questionnaire was distributed to 629 people, excluding incomplete or unqualified responses, a total of completed 320 questionnaires were used for analysis (50.9%). This study was approved by the Institutional Review Board of Yonsei University on July 21<sup>st</sup>, 2015 (1040917-201507-SB-180-02).

### Instrument development

Before starting the survey, respondents were given with a short scenario and a definition of the term 'healthy menu'. Participants were told to imagine themselves visiting a casual dining restaurant with their friends to have a regular meal during the day and to rule out special occasions (e.g., birthday party). The term 'healthy food' used in this research focused on menu items that contained fewer calories and fats and were nutritionally balanced. This definition of the term is commonly used relative to "unhealthy" food (e.g., food that contains too much fat or too many calories) within the restaurant industry. The same definition of the term was provided to participants in a written format.

The questionnaire items for this study were modified based on items from a previous study [7,12,14-15,31]. The questionnaire consisted of two parts. In Part 1, participants were asked to respond to behavioral beliefs, past behaviors, attitudes, and behavioral intentions related to healthy menu selection at casual restaurants (Table 1). Participants reported their behavioral beliefs regarding how the choice of 'healthy menu' items in a restaurant affect an individual's weight management, eating habits, disease prevention, health promotion, or self-satisfaction (e.g., "my healthy menu choice at a restaurant allows me to control my weight") using a 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree). Past behaviors were indirectly assessed using three items asking respondents about previous efforts to read menu labeling to select menus that contain less sugar, sodium, fat, and cholesterol, which are major nutritional contents that are considered to be unhealthy [32] (e.g., "how often do you read menu labeling to select a menu

that contains less sugar?") using a 5-point scale (1 = not at all, 5 = always). Customer attitudes toward selecting healthy menu were measured using seven items in a 5-point semantic scale (e.g., "for me, making healthy menu choice at a restaurant is extremely bad/good"), where a higher response score represents the participants' the positive attitude toward choosing a healthy menu (e.g., 1 = extremely bad, 5 = extremely good). Respondents' behavioral intentions toward choosing a healthy menu were constructed using four items (e.g., "I am willing to make healthy menu choices at a restaurant") based on the 5-point Likert-type scale (1 = strongly disagree, 5 = strongly agree).

Part 2 of the survey was designed to gather the respondents' demographic information, such as gender, age, education level, household income level, and marital status.

### Statistical analysis

Data collected in this study were analyzed using SPSS 24.0 for Windows and AMOS 24.0 for SPSS. In addition, SPSS 24.0 was used to conduct descriptive analysis of the demographic characteristics of the survey participants. AMOS 24.0 was used for Confirmatory Factor Analysis (CFA) to verify the validity of the measurement variables and to test the structural equation modeling (SEM) for the verification of the proposed hypotheses.

## RESULTS

### Descriptive analysis

The demographic characteristics of the sample are shown in Table 2. Among the 320 samples, 203 (63.4%) were female and 117 (36.6%) were male. The age of respondents ranged from

**Table 1.** Description of measures

Construct / questionnaire items	
Behavioral belief	
BB1	My healthy menu choice at a restaurant allows me to control my weight
BB2	My healthy menu choice at a restaurant helps me to maintain good eating habits
BB3	My healthy menu choice at a restaurant helps me to prevent obesity
BB4	My healthy menu choice at a restaurant helps me to improve my health
BB5	My healthy menu choice at a restaurant helps me to feel self-satisfied
Past behavior	
PB1	How often do you read menu labeling to select a menu item that contains less sugar?
PB2	How often do you read menu labeling to select a menu item that contains less sodium?
PB3	How often do you read menu labeling to select a menu item that contains less fat or cholesterol?
Attitude	
A1	For me, making healthy menu choices at a restaurant is extremely bad (1) / good (5)
A2	For me, making healthy menu choices at a restaurant is extremely undesirable (1) / desirable (5)
A3	For me, making healthy menu choices at a restaurant is extremely unpleasant (1) / pleasant (5)
A4	For me, making healthy menu choices at a restaurant is extremely foolish (1) / wise (5)
A5	For me, making healthy menu choices at a restaurant is extremely unfavorable (1) / favorable (5)
A6	For me, making healthy menu choices at a restaurant is extremely unenjoyable (1) / enjoyable (5)
A7	For me, making healthy menu choices at a restaurant is extremely negative (1) / positive (5)
Behavioral intention	
BI1	I intend to make healthy menu choices at restaurants
BI2	I am willing to make healthy menu choices at restaurants
BI3	I plan to make healthy menu choices at restaurants
BI4	I will make an effort to make healthy menu choices at restaurants

BB, behavioral belief; PB, past behavior; A, attitude; BI, behavioral intention.

**Table 2.** Demographic information of respondents

Demographics	Total (n = 320)	n (%)
Gender		
Male	117	36.6
Female	203	63.4
Age (yrs)		
20-24	47	14.7
25-34	124	38.8
35-44	93	29.1
Over 45	56	17.5
Education		
Below high school	46	14.4
Currently enrolled in college	30	9.4
2-yrs college degree	51	15.9
4-yrs bachelor's degree	168	52.5
Graduate degree	25	7.8
Household size		
1 or 2	74	23.2
3	67	20.9
4	143	44.7
Over 5	36	11.3
Annual household income		
Below 30 million KRW	54	16.9
30-39 million KRW	59	18.4
40-49 million KRW	66	20.6
50-59 million KRW	46	14.4
60-79 million KRW	45	14.1
Over 80 million KRW	50	15.6
Eating out frequency		
Over 5 times / week	44	13.8
3-4 times / week	71	22.2
1-2 times / week	139	43.4
1-3 times / month	66	20.6

KRW: South Korean won

20 to 58, and 38.8% of respondents were between the ages of 25 and 34 (n = 124). About 60% of the participants (n = 193) held a four-year bachelor's degree. Additionally, families of 4 members comprised the highest proportion, accounting for 143 samples (44.7%), followed by one or two family members (n = 74, 23.2%) and three family members (n = 67, 20.9%). The annual household income of the respondents varied widely; however, 44.1% of the respondents (n = 141) reported their annual household income to be more than 50 million KRW.

*Measurement model*

Prior to conducting the main analysis testing the proposed model, a CFA was performed to assess the reliability and validity of the measured items. As shown in Table 3, Cronbach's alpha ranged from 0.845 to 0.919, exceeding the recommended value of 0.7 and ensuring the reliability of each construct [33]. All standardized factor loadings ranged from 0.559 to 0.895 and their t-values (ranging from 9.492 to 19.752) were significant at the 0.001 level [33]. The average variance extracted (AVE) estimates of the four constructs ranged from 0.605 to 0.790,

**Table 3.** Confirmatory factor analysis result

Variables	Standardized loading	t-value	AVE	Composite reliability	Cronbach's α
<b>Behavioral belief</b>					
BB1	0.742	-	0.605	0.883	0.845
BB2	0.755	12.940*** <sup>1)</sup>			
BB3	0.750	12.853***			
BB4	0.842	14.322***			
BB5	0.559	9.492***			
<b>Past behavior</b>					
PB1	0.882	19.458***	0.790	0.919	0.906
PB2	0.895	19.752***			
PB3	0.882	-			
<b>Attitude</b>					
A1	0.761	-	0.680	0.937	0.919
A2	0.782	14.543***			
A3	0.790	14.734***			
A4	0.798	14.890***			
A5	0.777	14.436***			
A6	0.801	14.973***			
A7	0.801	14.970***			
<b>Behavioral intention</b>					
BI1	0.815	-	0.780	0.934	0.915
BI2	0.851	17.932***			
BI3	0.880	18.817***			
BI4	0.876	18.690***			

BB, behavioral belief; PB, past behavior; A, attitude; BI, behavioral intention, AVE, average variance extracted; df, degree of freedom; NFI, normed fit index; TLI, Tucker-Lewis index; CFI, comparative fit index; RMSEA, root mean squared error of approximation.

<sup>1)</sup> \*\*\* P < 0,001

<sup>2)</sup>  $\chi^2 = 373,635$ ,  $df = 146$ ,  $\chi^2/df = 2,559$ ,  $NFI = 0,912$ ,  $IFI = 0,945$ ,  $TLI = 0,935$ ,  $CFI = 0,944$ ,  $RMSEA = 0,070$

**Table 4.** Correlation coefficients between variables

	Behavioral belief	Past behavior	Attitude	Behavioral intention
Behavioral belief	<b>0.605</b> <sup>1)</sup>			
Past behavior	0.246 (.061)	<b>0.790</b>		
Attitude	0.523 (.274)	0.305 (0.093)	<b>0.680</b>	
Behavioral Intention	0.561 (.315)	0.472 (0.223)	0.725 (0.526)	<b>0.780</b>

<sup>1)</sup> Average variance extracted

<sup>2)</sup> Figures in parentheses refer to the squared values of the correlation coefficients

which were higher than the minimum threshold of 0.5 [35,36]. The composite reliability (ranging from 0.883 to 0.937) also exceeded the acceptable threshold of 0.7 [35,36].

As shown in Table 4, the pair of the squared coefficient of correlation between each construct was less than the AVE value, confirming the discriminant validity of the constructs [35,36].

*Structural equation modeling results*

SEM was employed to examine the relationships among behavioral beliefs, past behaviors, attitudes, and behavioral intentions toward choosing healthy menu items at restaurants (Fig. 1). The fit indices of SEM results indicated that the measurement model fits the covariance matrix drawn from the data at a satisfactory level based on a Chi-squared ( $\chi^2$ ) value

**Table 5.** Results of hypotheses tests

Hypotheses	Path coefficient ( $\beta$ )	t-value	Result
H1. Behavioral belief $\rightarrow$ attitude	0.487	7.466*** <sup>1)</sup>	Supported
H2. Past behavior $\rightarrow$ attitude	0.207	3.747***	Supported
H3. Attitude $\rightarrow$ behavioral intention	0.541	8.679***	Supported
H4. Behavioral belief $\rightarrow$ behavioral intention	0.231	4.255***	Supported
H5. Past behavior $\rightarrow$ behavioral intention	0.271	5.816***	Supported

<sup>1)</sup> \*\*\*  $P < 0,001$

<sup>2)</sup> Chi-square ( $\chi^2$ ) = 389,170, degree of freedom (df) = 147, chi-square divided by degree of freedom ( $\chi^2/df$ ) = 2,647, normed fit index (NFI) = 0,909, incremental fit index (IFI) = 0,941, tucker-lewis index (TLI) = 0,931, comparative fit index (CFI) = 0,941, root mean squared error of approximation (RMSEA) = 0,072

of 389.170 [Degree of freedom (df) = 147,  $P < 0.001$ ], Chi-square divided by degree of freedom ( $\chi^2/df$ ) = 2.647, Normed fit index (NFI) = 0.909, Incremental fit index (IFI) = 0.941, Tucker-Lewis index (TLI) = 0.931, Comparative fit index (CFI) = 0.941, Root mean squared error of approximation (RMSEA) = 0.072.

Based on the results of the SEM, all hypotheses were supported (Table 5). Hypothesis 1, which predicted that behavioral beliefs would have a positive influence on attitude, was supported by a positive standardized coefficient of 0.487 ( $t = 7.466$ ,  $P < 0.001$ ). Hypothesis 2, which predicted a positive relationship between past behaviors and the attitudes, was also supported ( $\chi = 0.207$ ,  $t = 3.747$ ,  $P < 0.01$ ). Furthermore, the attitudes positively influenced behavioral intentions, supporting hypothesis 3 with a path coefficient ( $\beta$ ) of 0.541 ( $t = 8679$ ,  $P < 0.001$ ). Behavioral beliefs significantly influenced behavioral intentions toward choosing a healthy menu item, supporting hypothesis 4 with a positive standardized coefficient of 0.231 ( $t = 4.255$ ,  $P < 0.01$ ). Finally, past behaviors appeared to have a positive influence on behavioral intentions, supporting hypothesis 5 ( $\chi = 0.271$ ,  $t = 5.816$ ,  $P < 0.001$ ).

## DISCUSSION

As the increasing incidence of global obesity is causing enormous socioeconomic costs, governments worldwide are implementing regulations on the restaurant industry. Along with direct regulation, consumers' overall consideration of eating and buying healthy products has gained attention. Therefore, marketers are introducing and promoting healthy menus, and the importance of research regarding consumers' healthy menu selection has been heightened to deter the trend. The present study was conducted to analyze the relationship among psychological variables (behavioral beliefs, past behaviors, attitudes and behavioral intentions) with regard to the choice of healthy menu items and to provide a basic outlook regarding restaurant customers' healthy menu choices in the foodservice industry.

The results of this study revealed that factors used in the TPB also explained restaurant consumers' behavior in selecting healthy food. Specifically, consumers' individual behavioral beliefs and past behaviors influenced their attitude toward selection of healthy products in a casual restaurant setting. In addition, all factors, behavioral beliefs, past behaviors, and attitudes toward selecting a healthy product had a significant positive influence on behavioral intentions to choose healthy menu items. These results are consistent with those of previous studies in which behavioral beliefs and past behaviors are used

as powerful predictors of behavioral intentions [12,37]. Specifically, whether to choose between a healthy and indulgent menu item is known to be a habit, and the outcomes of eating healthy are usually rewarded on a long-term basis [38]. Specifically, the effects of behavioral beliefs and past behaviors on behavioral intentions to make healthy menu choices can be regarded as achieving a long-term goal of maintaining health. In addition, Jeong & Ham [8] explained that restaurant consumers who have strong health beliefs were more likely to use food nutrition labeling, while Jun *et al.* [39] reported that consumers who are highly health conscious are more likely to choose healthy menus in a restaurant.

The effect of past behaviors on behavioral intentions is similar to that observed in previous studies that demonstrated that consumers' behavior of choosing food was habitual [37,40]. Cheng, Lam & Hsu [37] emphasized that past behaviors are essential variables in predicting consumer behavior in the foodservice industry. Khare & Inman [40] have shown that consumers tend to rely on their usual food consumption habits to conserve mental resources. Past behaviors are also considered a major construct for predicting future behaviors or behavioral intentions.

The mediating effects found in this study indicate that the effects of behavioral beliefs and past behaviors on behavioral intentions to select healthy menu are mediated by the attitude toward choosing a healthy menu. This is consistent with the finding by Cheng *et al.* [37] that, among several TPB variables, attitude mediates the effects of past behaviors on behavioral intentions in the context of restaurant consumers sharing negative word of mouth behavior. Similarly, Ajzen [31] found that attitudes mediate the effect of several independent variables in the TPB model on behavioral intentions.

The contributions of this study are as follows. First, this study makes a theoretical contribution in that it attempts to estimate consumers' behavioral intentions to select healthy menu items by using the main variables from the TPB. The TPB has been regarded as one of the most powerful models that explain consumer behavior [11-14] and has been widely used within the health-related context as well [16-21]. Use of the main variables from TPB demonstrated a profound effect of behavioral beliefs and attitudes on behavioral intentions in a healthy menu choice setting at casual dining restaurants. Furthermore, previous studies of restaurant consumers' menu selection in a restaurant setting mostly missed the importance of past behaviors [16-21], despite the repetitive nature of menu choice. Reflecting the behavioral patterns of restaurant consumers, the result of the relationship among past behaviors, attitudes, and behavioral

intentions enhanced the predictability of consumers' behavioral intentions toward selection of healthy menu items.

Second, this study has practical implications for marketers in the restaurant industry. Based on the finding that behavioral beliefs influence the intention to select healthy menu items, it can be inferred that pre-determined factors may lead consumers to make decisions at restaurants. Some previous studies regarding dual-processing theories, which is one of the most popular theories regarding the consumer decision-making process and explains that consumers make decisions based either on cognitive or emotional processes, emphasize the role of the emotional process in the food selection context since indulgent eating behaviors are often provoked by situational factors [10,38,42-43]. However, the results found in this study suggest that the values or beliefs that were established on a personal level lead to consumer willingness to choose healthy menu items. Therefore, while situational factors may impact consumers' decision-making process, the logical evaluation that combines personal values and information should not be neglected. Taken together, these findings indicate that marketers and practitioners who want to sell healthy menu items should consider focusing more on health-conscious consumers who have deep-rooted personal values and putting more effort into building a brand image of being healthy or green to entice such consumers, rather than expecting consumers with varying beliefs to change their decisions from unhealthy to healthy ones on-site.

Third, the results of this study also have implications for public health policymakers. From the results of this study, it can be inferred that nutritional education or public campaigns that emphasize the long-term benefits of eating healthy may induce an effective result in promoting healthy eating behaviors. Maintaining one's health is considered a long-term goal, and food consumption is a repetitive action that affects this goal. This fact suggests that the expansion of nutritional education in schools and local public health centers could reduce medical expenses. Moreover, teaching people how to use nutrition labeling would also have positive results. While previous studies on the use of menu labeling have shown varied effectiveness [44,45], this study extends and supports the reasoning that consumers rely on rational decision-making processes when making food choices.

Despite the contributions this study made, it still holds some limitations. First, variables introduced in this study, beliefs, past behaviors, attitudes, and behavioral intentions, are limited in that they are part of the variables used in the TPB. Adding other belief variables, such as normative belief and control belief, to behavioral beliefs, as well as other mediators, such as subjective norms and behavioral control could result in a more structured outcome of explaining the psychographics of consumers regarding selection of healthy menu items. Second, although the measurement of variables used in this study was based on previous studies [7,12,14-15,31], the use of self-reported measures may convey some exaggerations. We attempted to enhance the reliability by using multiple items per variables, but it may be useful to validate the results with experimental research. Third, we did not include any lifestyle factors or personal values of individual consumers which may moderate the effect. Exploring

such differences in future research would be useful to analysis of differences in choosing healthy menu items among certain groups through cluster analysis or comparative analysis. Finally, the sample of this study was restricted to consumers living in South Korea, potentially limiting its generalizability. Given that individual behaviors could differ among social and cultural environments, it is possible that the decision-making process and personal values could differ as well. Therefore, future research could investigate the effects of possible differences among other geographical regions on the psychological values of consumers as they pertain to selecting healthy menu items in other geographic areas.

## CONFLICT OF INTEREST

The authors declare no potential conflicts of interests.

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