

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

Heewon Kim¹, Youngshin Kim¹, Hyung-Min Choi² and Sunny Ham^{1S}

¹Department of Food and Nutrition, Institute of Symbiotic Life-TECH, Yonsei University, 50 Yonsei-ro, Seodaemun-gu, Seoul 03722, Korea

²International Center for Hospitality Research and Development, Dedman School of Hospitality, Florida State University, 288 Champions Way UCB 4117 Tallahassee, FL 32306, USA

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.

Nutrition Research and Practice 2018;12(4):348-354; <https://doi.org/10.4162/nrp.2018.12.4.348>; pISSN 1976-1457 eISSN 2005-6168

Keywords: Obesity, restaurants, attitude, belief, consumer behavior

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,

^S Corresponding Author: Sunny Ham, Tel. 82-2-2123-3121, Email. sham2@yonsei.ac.kr

Received: May 20, 2018, Revised: July 16, 2018, Accepted: July 17, 2018

This is an Open Access article distributed under the terms of the Creative Commons Attribution Non-Commercial License (<http://creativecommons.org/licenses/by-nc/3.0/>) which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

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.

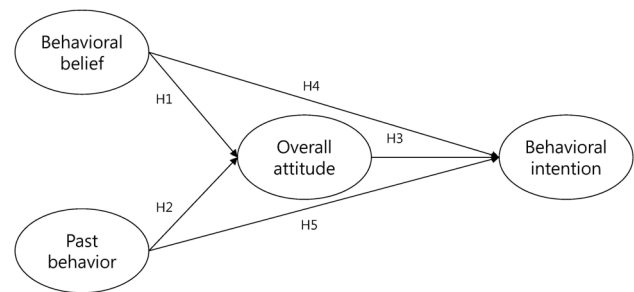


Fig 1. Conceptual framework of the study

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 21st, 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 |
|-----------------------------|----------------------|-------------------------|-------|-----------------------|---------------------|
| Behavioral belief | | | | | |
| BB1 | 0.742 | - | 0.605 | 0.883 | 0.845 |
| BB2 | 0.755 | 12.940*** ¹⁾ | | | |
| BB3 | 0.750 | 12.853*** | | | |
| BB4 | 0.842 | 14.322*** | | | |
| BB5 | 0.559 | 9.492*** | | | |
| Past behavior | | | | | |
| PB1 | 0.882 | 19.458*** | 0.790 | 0.919 | 0.906 |
| PB2 | 0.895 | 19.752*** | | | |
| PB3 | 0.882 | - | | | |
| Attitude | | | | | |
| 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*** | | | |
| Behavioral intention | | | | | |
| 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.

¹⁾ *** $P < 0.001$

²⁾ $\chi^2 = 373.635$, $df = 146$, $\chi^2/df = 2.559$, $NFI = 0.912$, $IFI = 0.945$, $TLI = 0.935$, $CFI = 0.944$, $RMSEA = 0.070$

Table 4. Correlation coefficients between variables

| | Behavioral belief | Past behavior | Attitude | Behavioral intention |
|----------------------|----------------------------|---------------|---------------|----------------------|
| Behavioral belief | 0.605 ¹⁾ | | | |
| Past behavior | 0.246 (.061) | 0.790 | | |
| Attitude | 0.523 (.274) | 0.305 (0.093) | 0.680 | |
| Behavioral Intention | 0.561 (.315) | 0.472 (0.223) | 0.725 (0.526) | 0.780 |

¹⁾ Average variance extracted

²⁾ 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 (χ^2) value

Table 5. Results of hypotheses tests

| Hypotheses | Path coefficient (β) | t-value | Result |
|--|------------------------------|------------------------|-----------|
| H1. Behavioral belief \rightarrow attitude | 0.487 | 7.466*** ¹⁾ | 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 |

¹⁾ *** $P < 0,001$

²⁾ Chi-square (χ^2) = 389,170, degree of freedom (df) = 147, chi-square divided by degree of freedom (χ^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 (χ^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 (β) 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.

ORCID

Heewon Kim: <https://orcid.org/0000-0003-0399-2095>

Youngshin Kim: <https://orcid.org/0000-0003-4628-4443>

Hyung-Min Choi: <https://orcid.org/0000-0001-5775-9139>

Sunny Ham: <https://orcid.org/0000-0001-8666-5027>

REFERENCES

1. Ministry of Health and Welfare, Korea Centers for Disease Control and Prevention. Korea Health Statistics 2016: Korea National Health and Nutrition Examination Survey (KHANES VII-1). Cheongwon: Korea Centers for Disease Control and Prevention; 2018.
2. World Health Organization. Obesity and overweight [Internet]. Geneva: World Health Organization; 2018 [cited 2018 April 21]. Available from: <http://www.who.int/mediacentre/factsheets/fs311/en/>.
3. McKinsey Global Institute. Overcoming obesity: an initial economic analysis [Internet]. New York, NY: McKinsey Global Institute; 2014 [cited 2018 April 21]. Available from: https://www.mckinsey.com/~media/McKinsey/Business%20Functions/Economic%20Studies%20TEMP/Our%20Insights/How%20the%20world%20could%20better%20fight%20obesity/MGI_Overcoming_obesity_Full_report.ashx.
4. Kim TH, Lee EK, Han E. Food away from home and body mass outcomes: taking heterogeneity into account enhances quality of results. *Nutrition* 2014;30:1015-21.
5. Euromonitor International. Country report: consumer foodservice in South Korea [Internet]. London: Euromonitor International; 2017 [cited 2018 April 21]. Available from: <http://www.euromonitor.com/consumer-foodservice-in-south-korea/report>.
6. Wright KB, Mazzone R, Oh H, Du J, Smithson AB, Ryan D, MacNeil D, Tong X, Stiller C. The influence of U.S. chain restaurant food consumption and obesity in China and South Korea: an ecological perspective of food consumption, self-efficacy in weight management, willingness to communicate about weight/diet, and depression. *Health Commun* 2016;31:1356-66.
7. Kang J, Jun J, Arendt SW. Understanding customers' healthy food choices at casual dining restaurants: using the value-attitude-behavior model. *Int J Hosp Manag* 2015;48:12-21.
8. Jeong JY, Ham S. Application of the Health belief model to customers' use of menu labels in restaurants. *Appetite* 2018;123:

- 208-15.
9. Amrein MA, Rackow P, Inauen J, Radtke T, Scholz U. The role of compensatory health beliefs in eating behavior change: a mixed method study. *Appetite* 2017;116:1-10.
 10. Hagger MS, Trost N, Keech JJ, Chan DK, Hamilton K. Predicting sugar consumption: application of an integrated dual-process, dual-phase model. *Appetite* 2017;116:147-56.
 11. Hsu CL, Chang CY, Yansritakul C. Exploring purchase intention of green skincare products using the theory of planned behavior: testing the moderating effects of country of origin and price sensitivity. *J Retailing Consum Serv* 2017;34:145-52.
 12. Smith JR, Terry DJ, Manstead AS, Louis WR, Kotterman D, Wolfs J. The attitude-behavior relationship in consumer conduct: the role of norms, past behavior, and self-identity. *J Soc Psychol* 2008; 148:311-33.
 13. Ajzen I. The theory of planned behavior. *Organ Behav Hum Decis Process* 1991;50:179-211.
 14. Ajzen I, Fishbein M. Attitude-behavior relations: a theoretical analysis and review of empirical research. *Psychol Bull* 1977;84: 888-918.
 15. Kim E, Ham S. Development and validation of a measure of consumer behaviors toward nutritional labeling in restaurants. *J Foodserv Bus Res* 2017;20:595-610.
 16. Malek L, Umberger WJ, Makrides M, ShaoJia Z. Predicting healthy eating intention and adherence to dietary recommendations during pregnancy in Australia using the theory of planned behaviour. *Appetite* 2017;116:431-41.
 17. Kim E, Ham S, Yang IS, Choi JG. The roles of attitude, subjective norm, and perceived behavioral control in the formation of consumers' behavioral intentions to read menu labels in the restaurant industry. *Int J Hosp Manag* 2013;35:203-13.
 18. Jun J, Arendt SW. Understanding healthy eating behaviors at casual dining restaurants using the extended theory of planned behavior. *Int J Hosp Manag* 2016;53:106-15.
 19. Shin YH, Im J, Jung SE, Severt K. The theory of planned behavior and the norm activation model approach to consumer behavior regarding organic menus. *Int J Hosp Manag* 2018;69:21-9.
 20. Seo HS, Lee SK, Nam S. Factors influencing fast food consumption behaviors of middle-school students in Seoul: an application of theory of planned behaviors. *Nutr Res Pract* 2011;5:169-78.
 21. Seo S, Kim OY, Shim S. Using the theory of planned behavior to determine factors influencing processed foods consumption behavior. *Nutr Res Pract* 2014;8:327-35.
 22. Han H, Kim Y. An investigation of green hotel customers' decision formation: developing an extended model of the theory of planned behavior. *Int J Hosp Manag* 2010;29:659-68.
 23. Kim YJ, Njite D, Hancer M. Anticipated emotion in consumers' intentions to select eco-friendly restaurants: augmenting the theory of planned behavior. *Int J Hosp Manag* 2013;34:255-62.
 24. Steptoe A, Pollard TM, Wardle J. Development of a measure of the motives underlying the selection of food: the food choice questionnaire. *Appetite* 1995;25:267-84.
 25. Wang YF. Modeling predictors of restaurant employees' green behavior: Comparison of six attitude-behavior models. *Int J Hosp Manag* 2016;58:66-81.
 26. Bamberg S, Ajzen I, Schmidt P. Choice of travel mode in the theory of planned behavior: the roles of past behavior, habit, and reasoned action. *Basic Appl Soc Psych* 2003;25:175-87.
 27. Ouellette JA, Wood W. Habit and intention in everyday life: the multiple processes by which past behavior predicts future behavior. *Psychol Bull* 1998;124:54-74.
 28. Sutton S. Predicting and explaining intentions and behavior: how well are we doing? *J Appl Soc Psychol* 1998;28:1317-38.
 29. Feunekes GI, Gortemaker IA, Willems AA, Lion R, van den Kommer M. Front-of-pack nutrition labelling: testing effectiveness of different nutrition labelling formats front-of-pack in four European countries. *Appetite* 2008;50:57-70.
 30. Verbeke W, Vackier I. Individual determinants of fish consumption: application of the theory of planned behaviour. *Appetite* 2005; 44:67-82.
 31. Ajzen I. Nature and operation of attitudes. *Annu Rev Psychol* 2001;52:27-58.
 32. Bucher T, Müller B, Siegrist M. What is healthy food? Objective nutrient profile scores and subjective lay evaluations in comparison. *Appetite* 2015;95:408-14.
 33. Nunnally JC. *Psychometric Theory*, 2nd ed. New York, NY: McGraw-Hill; 1978.
 34. Bagozzi RP, Yi Y. On the evaluation of structural equation models. *J Acad Mark Sci* 1988;16:74-94.
 35. Fornell C, Larcker DF. Evaluating structural equation models with unobservable variables and measurement error. *J Mark Res* 1981; 18:39-50.
 36. Hair JF Jr, Black WC, Babin BJ, Anderson RE. *Multivariate Data Analysis*, 7th ed. Englewood Cliffs, NJ: Prentice-Hall; 2010.
 37. Cheng S, Lam T, Hsu CH. Testing the sufficiency of the theory of planned behavior: a case of customer dissatisfaction responses in restaurants. *Int J Hosp Manag* 2005;24:475-92.
 38. Chan EK, Kwortnik R, Wansink B. McHealthy: how marketing incentives influence healthy food choices. *Cornell Hosp Q* 2017; 58:6-22.
 39. Jun J, Kang J, Arendt SW. The effects of health value on healthful food selection intention at restaurants: considering the role of attitudes toward taste and healthfulness of healthful foods. *Int J Hosp Manag* 2014;42:85-91.
 40. Khare A, Inman JJ. Habitual behavior in American eating patterns: the role of meal occasions. *J Consum Res* 2006;32:567-75.
 41. Conner M, Norman P, Bell R. The theory of planned behavior and healthy eating. *Health Psychol* 2002;21:194-201.
 42. Kahneman D. *Thinking Fast and Slow*. New York, NY: Macmillan Publishing; 2011.
 43. Talukdar D, Lindsey C. To buy or not to buy: consumers' demand response patterns for healthy versus unhealthy food. *J Mark* 2013;77:124-38.
 44. Cantor J, Torres A, Abrams C, Elbel B. Five years later: awareness of New York city's calorie labels declined, with no changes in calories purchased. *Health Aff (Millwood)* 2015;34:1893-900.
 45. Elbel B, Mijanovich T, Dixon LB, Abrams C, Weitzman B, Kersh R, Auchincloss AH, Ogedegbe G. Calorie labeling, fast food purchasing and restaurant visits. *Obesity (Silver Spring)* 2013;21:2172-9.