

# Influence of Informational Clues on Subjective Knowledge, Concern, and Satisfaction and Behavioral Intention toward Healthy Foods in Full-service Restaurants

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**ABSTRACT:** The purpose of current study is to verify a formulated model that explains the influence of informational clues (Nutritional label information and Mass media information) on subjective knowledge, concern, satisfaction, and behavioral intention toward healthy foods in context of full-service restaurants. The results of present study demonstrated that all informational clues have significant influence on both knowledge and concern about health and the significant relationships were confirmed between knowledge, concern, emotional pleasure, and behavioral intention. This study may contribute to develop meaningful marketing strategic for healthy foods in full-service sector, and it can be utilized as a critical study to establish an attractive business strategies to increase revenue as well as satisfy healthy foods consumers in full-service restaurant consumers.

**Keywords:** full-service restaurant, healthy food, informational clues, subjective knowledge, concern, satisfaction, behavioral intention

## INTRODUCTION

Modern population faces a lot of health issues closely linked to people's eating including obesity. Based on this circumstance, healthy foods or healthy options in a restaurant are drawing attention and has become a critical norm of interest in both academia and the foodservice industry[1,2].

Prior researches identified important factors impact consumers' food choices including some tangible elements such as appearance, texture, color, and some intangible elements such as knowledge, concern, and information of foods[3,4,5,6,7]. More specifically, Healthierington[8] stated emotional clues, such as pleasure, increase during eating, and imposes an influence on consumption.

Previous studied revealed that informational sources

could significantly influence improvement of people's healthy eating. For example, mass media, informal informational sources, and educational material are significant factors that linked to eating behaviors[9,10,11]. Even though previous studies verified numerous elements influence consumers' food choices, very limited studies have considered informational clues affecting customers' concern, knowledge as well as future behaviors for healthy food. In addition, little research examined the relationships among informational clues about healthy foods, knowledge, concern, satisfaction, and behavioral intention toward healthy food choice especially in full-service restaurant context. This study focuses on the theoretical relationships among two major antecedents for informational clues and other dependent variables. More specifically, priority concern of cur-

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rent study is to verify how the informational clues are linked to other factors including knowledge, concern, satisfaction, and behavioral intention. Namely, the ultimate goal of present study are to confirm the importance of informational clues of healthy foods and to assess the relationship among the informational clues and other critical components such as knowledge, concern, satisfaction, and behavioral intention toward healthy foods. Current study can contribute to provide strategical suggestion for managers or service providers of full-service restaurants to encourage healthy foods, and provide meaningful academic reference by demonstrating the formulated theoretical model.

## LITERATURE REVIEW

### *Informational Clue 1: Nutritional Label Information*

Label or symbol has been identified as an significant element which is closely related to consumers' behavior or decision for choosing a menu in restaurants, so food labels on menus have recognized as a critical norm in previous studies[12,13,14]. For instance, Horgen and Brownell[13] found messages on menus significantly have impacted on consumption toward healthy foods in a restaurant. In addition, other studies revealed that menu symbol or labeling have consideration as significant clue that directly linked to visitors' satisfaction in context of restaurants[15,16]. Hence, current study proposes that the nutritional label information can influence on peoples' people's subjective knowledge and concern about health as well as consumers' final decision about foods in a restaurant.

### *Informational Clue 2: Mass Media Information*

In numerous studies demonstrated that information from media is one of significant instrument that can various affect on people's consumption[17,18]. In foodservice industry, the mass media has been considered as an powerful tool that is closely linked to consumers' eating behaviors[19,20]. For instance, Grainger et al[19] identified that fast-food advertising can influence parents' fast-food consumption to their children positively. In addition, a current study assert mass media is a critical marketing tool to encourage healthy foods as well as avoid unhealthy

foods[21]. Even though, the importance of mass media information were demonstrated by previous scholars, the formulated relationships among information clues and other variables for healthy foods in full-service restaurant sector.

### *Subjective Knowledge*

Previous research has identified the knowledge plays in final decision-making and it can classify subjective knowledge and objective knowledge[19,22, 23,24]. Brucks[22] reported that objective knowledge can be developed the actual information or organization of knowledge through person's memory, while subjective knowledge can be identified person's self-confidence or perceived level of knowledge. Knowledge about food is also one of the important antecedents to understanding customer behavior because it can affect people's behaviors, such as their food choices, intention to repurchase[19,24,25,26]. In prior studies, some evidence appeared to verify that consumer use their own knowledge to encourage their diets[19,27,28,29]. For example, personal knowledge about can have a positive influence on a person's self-confidence about health and consumption of a reduced-fat diet[19,24]. Hence, the perceived knowledge can be significant predictor as well as dependent variable such as consumer's level of satisfaction or future behavior toward eating healthy foods.

### *Concern*

Health concern has been concentrated on significant factor that can influence on consumers' eating behavior[30,31,32]. Sun[7] identified that concern about health such as worrying for calories of foods and disease could significantly motivate people's specific food choices. Therefore, health conscious consumers tend to seek foods with health and nutritional benefits and people try to eat healthier foods and healthy food consumption[10,33]. Previous studies revealed that restaurant consumers, who have higher health consciousness, are more interested in weight control, appearance, and disease prevention[33,34, 35,36]. The increasing interest in health is illustrated by healthier behaviors or attitudes that are dominating restaurant selection along with visitors satisfaction, and customers are willing to pay more money for

healthy items in a restaurant[37]. Although prior studies verified the importance of relationships between health concern and consumers' behaviors, limited study perform the model for healthy food choices in full-service restaurant.

### *Satisfaction*

Numerous prior studies revealed that people's satisfaction is a initial determinant for long-term behavior, and employed the norm to estimate future behaviors in various foodservice sectors[5,38,39,40,41]. Westbrook and Oliver[42,43] said satisfaction is level of service or product overall performance, or perceived perception about quality through their experiences. In the restaurant context, satisfaction has been employed as an overall gap between consumers' expectations and their evaluation through experiences after or before enjoying the service/product in a restaurant[38,41]. Therefore, this study has employed the satisfaction toward healthy foods as dependent variable of consumers' knowledge and concern about health as well as significant predictor of customer behavioral intention in full-service restaurants.

### *Behavioral Intention*

Behavioral intention has been considered as an initial factor that lead to long-term business success because it represent a consumer's belief or intention to repurchase same product or service[40,45,46,47]. Oliver[44] defined that behavioral intention crossly linked to a visitor's intention to recommend any things to other people. In context of foodservice sector, many researchers employed the concept of behavioral intention as result construct influenced by other core variables such as knowledge[48], concern[33], satisfaction[40,49]. For instance, Coulson [48] performed a study to confirm relationships among food knowledge of label, attitudes, and the behavior among young consumers. Therefore, this study conducts to verify the major constructs including information clues, knowledge, concern, and satisfaction have influence on behavioral intention both directly and indirectly.

### *Hypothesis Development*

Healthy foods is not new trend in foodservice industry anymore, it was already considered as a criti-

cal element in both academia and industry. Therefore, better understanding of consumers' behaviors related to health or eating habits can be very valuable at this moment. Although previous studies have evaluated numerous elements that influence eating behaviors, limited literatures conducted to identify the importance of information clues especially for healthy foods in fullservice restaurant. Therefore, the current study endeavors to find significant relationships between information clues and knowledge and concern based on previous studies[13,19], and formulated hypothesis are following:

H1: Information clues will influence on subjective knowledge about healthy foods.

H1-1. Nutritional label information of healthy food positively influences subjective knowledge for health.

H1-2. Mass media information of healthy food positively influences subjective knowledge for health.

H2: Information clues will influence on concern about healthy foods.

H2-1. Nutritional label information of healthy food positively influences concern for health.

H2-2. Mass media information of healthy food positively influences concern for health.

In addition, prior researches demonstrated the significant relationships among knowledge, concern, satisfaction as well as behavioral intention[7,33,37, 48]. Therefore, current study performs to confirm the relationships as perceived by healthy food consumptions in fullservice sector, and developed the following hypothesizes.

H3: Subjective knowledge will influence on concern about healthy foods.

H4: Subjective knowledge will influence on customer satisfaction about healthy foods.

H5: Health concern will influence on customer satisfaction about healthy foods.

H6: Customer satisfaction will influence on behavioral intention toward healthy foods.

## **METHODOLOGY**

Previous studies[16,18,23,33,37,40,47,48], developed a survey to establish measurements for information clues, subjective knowledge, health concern, satisfaction, and behavioral intentions. All measurement employed a 7-point Likert-type scale (1: strongly disagree to 7: strongly agree) for items: 'Please indicate your level of agreement with the following statement.

#### *Data and Sample*

A developed self-administrated survey distributed to achieve present study's objectives. Before distributing the survey, four graduate students and three professors who are major in hospitality management checked content validity of questionnaires and final survey was modified based on the their comments. Developed questionnaire was distributed through an online survey company to 600 full-service restaurant customers in U.S. who enjoyed healthy food(s) in fullservice restaurants. The company collected data from its panel of online respondents in all of USA. Out of the 600 respondents, 88 respondents were removed because of missing values and disqualified data. SPSS 21.0 and AMOS 21.0 were employed for the confirmatory factor analysis and structural equation modeling(SEM) to conduct the frequency analysis, reliability analysis and measurement model validation[53].

## **RESULTS**

#### *Demographic Information*

The results of participants' socio-demographics show in Table 1. Of the total number of participants, male (49.6%) and female (50.4%) were similar ration, and the most frequently ethnic was caucasian (80.4 %). Approximately 56% of the participants were married and the most frequently occupation was retired people (26%) followed by managers, administrators, and professional group (21.7%), and professional trades and related (17.6%).

#### *Measurement Model and Discriminant Validity Analysis*

To confirm the structure of the six constructs: two information clues, subjective knowledge about heal-

Table 1. General characteristics of the subjects

	Characteristic	n	%
Gender	Male	254	49.6
	Female	258	50.4
Marital	Single	200	39.1
	Married	285	55.7
	Other	27	5.3
Ethnic	Caucasian	413	80.7
	Hispanic	33	6.4
	African-American	37	7.2
	Asian Oriental	21	4.1
	Other	8	1.6
Occupation	Professional trades and related	90	17.6
	Managers, administrators, professionals	111	21.7
	Students	31	6.1
	Clerical, service, sales workers	65	12.7
	Retired	133	26.0
	Home markers	42	8.2
	Unemployed	40	7.8
Total		512	100.0

thy foods, concern for health, satisfaction, and behavioral intention, present study verified the reliability, validity, and unidimensionality of the all variables before analyzing the structural model. hypotheses testing for current study involves all measurement because all factor loadings were higher than the standard level 0.4[51]. The results reported that the ranges of Cronbach's alpha for the six factors (0.868 to 0.941) are suitable for the appropriate level of internal consistency[51]. The ranges of composite reliabilities (Nutritional label information: 0.887, Mass media information: 0.886, Subjective knowledge: 0.852, health concern: 0.783, satisfaction: 0.946, behavioral intention: 0.912) are also appropriate[52]. Discriminate validity was confirmed based on comparing the AVE and the squared correlation factors because the

range of AVE (0.55 to 0.86) exceeds the range of squared correlations for each pair of constructs (0.12 to 0.36). In addition, formulated measurement models confirmed the reliability of the measurement properties ( $\chi^2(174)=553.593$ ,  $p<0.001$ , NFI=0.931, IFI=0.953, TLI=0.943, CFI=0.952, and RMSEA=0.064(see Table 2).

Subsequent structural equation modeling (SEM) verified the formulated model and allowed assessment of the eight paths with six hypotheses. The Chi-square statistic is 655.518 with 180 degrees of freedom ( $p<0.001$ , CMIN/DF=3.642), and all of indices represent that the model has satisfactory fit (NFI=0.916, IFI=0.937, TLI=0.927, CFI=0.937, RMSEA=0.072) according to standards by Anderson and Gerbing [53]. Based on the results, all hypothesized were confirmed significantly. Specifically, both information clues positively influence subjective knowledge (Hypothesis 1-1:  $\beta=0.28$   $t=4.70$ ;  $p<0.001$ ; Hypothesis 1-2:  $\beta=0.29$   $t=5.24$ ;  $p<0.001$ ) as well as concern for health (Hypothesis 2-1:  $\beta=0.17$   $t=2.93$ ;  $p<0.01$ ; Hypothesis 2-2:  $\beta=0.25$   $t=4.51$ ;  $p<0.001$ ). In addition, current study identified the subjective knowledge is significant predictor of health concern (Hypothesis 3:  $\beta=0.42$   $t=8.11$ ;  $p<0.001$ ) and satisfaction (Hypothesis 4:  $\beta=0.28$   $t=4.73$ ;  $p<0.001$ ). Furthermore, health concern has positive influence on satisfaction (Hypothesis 5:  $\beta=0.40$   $t=6.35$ ;  $p<0.001$ , and the satisfaction was critical antecedent of behavioral intention (Hypothesis 6:  $\beta=0.48$   $t=10.49$ ;  $p<0.001$ ). (see Table 3 & Figure 1).

Based on these results, the current study demonstrates information clues are significant elements that can influence on knowledge and concern for health positively. Similar with previous results, the subjective knowledge and health concern are critical predictors of customer satisfaction about healthy foods and satisfied consumers are willing to recommend or repurchase the healthy foods in the full-service restaurants.

## CONTRIBUTIONS

The result of this research contributes to understanding the influence of information clues about healthy foods through label and mass media on subjective knowledge, health concern, and behavioral intention toward healthy foods in full-service restaurant area. The findings identified all relationships among six variables were significant. Particularly, in addition, present study verified the importance of information clues related to healthy foods because it significantly influence on knowledge and concern. Based on the findings, current study revealed that consumers who are interested in any information about healthy foods, have more subjective knowledge and concern for health. Furthermore, the consumers are positive assessment about the full-service restaurants and they are willing to continue to visit the place or recommend the restaurant to others.

Table 2. Confirmatory factor analysis and discriminant validity

	NLI	MAI	SKN	CON	SAT	BHL
NLI	0.67 <sup>a</sup>					
MAI	0.30	0.73				
SKN	0.14	0.10	0.60			
CON	0.31	0.25	0.36	0.55		
SAT	0.18	0.23	0.26	0.26	0.86	
BHL	0.12	0.17	0.27	0.24	0.22	0.73
$\chi^2=533.593$ , d.f.=174, IFI=0.953, TLI=0.943, CFI=0.952, GFI=0.904, AGFI=0.873, RMSEA=0.064						

LAI=Nutritional label information, MAI=Mass media information, SKN=Subjective knowledge, CON=Concern, SAT=Satisfaction, BL=Behavioral loyalty, IFI=Incremental fit index, TLI=Tucker-lewis index, CFI=Comparative fit index, GFI=Goodness of fit index, AGFI=Adjusted goodness of fit index, RMSEA=Root mean square error of approximation. Note. <sup>a</sup> AVE is on the diagonal. Squared of paired constructs are on the off-diagonal.

\*  $p<0.05$ , \*\*  $p<0.01$ , \*\*\*  $p<0.001$ .

Table 3. Structural parameter estimates

Hypothesized path	Coefficient ( $\beta$ )	t-value	Results
Hypothesis 1-1: Nutritional label information $\rightarrow$ Subjective knowledge	0.28	4.70***	Supported
Hypothesis 1-2: Mass media information $\rightarrow$ Subjective knowledge	0.29	5.24***	Supported
Hypothesis 2-1: Nutritional label information $\rightarrow$ Concern	0.17	2.93**	Supported
Hypothesis 2-2: Mass media information $\rightarrow$ Concern	0.25	4.51***	Supported
Hypothesis 3: Subjective knowledge $\rightarrow$ Concern	0.42	8.11***	Supported
Hypothesis 4: Subjective knowledge $\rightarrow$ Satisfaction	0.28	4.73***	Supported
Hypothesis 5: Concern $\rightarrow$ Satisfaction	0.40	6.35***	Supported
Hypothesis 6: Satisfaction $\rightarrow$ Behavioral intention	0.48	10.49***	Supported
$\chi^2=655.518$ , d.f.=180, IFI=0.937, TLI=0.927, CFI=0.937, GFI=0.887, AFFI=0.855, RMSEA=0.072			

\*  $p < 0.05$ , \*\*  $p < 0.01$ , \*\*\*  $p < 0.001$ .

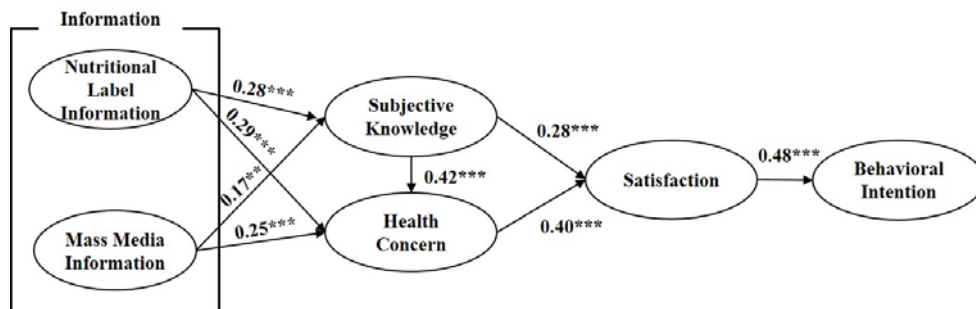


Figure 1. Result of hypotheses.

Namely, this study can provide some meaningful theoretical contributions as well as practical suggestions.

First, this study identified the information clues are significant predictors of knowledge and concern for health, and these results supported by prior studies [19,24,50]. Therefore, managers of full-service restaurants need to provide diverse information about healthy food items through label or mass media to their customers. If consumers receive enough information about healthy foods from the information sources, the consumers believe they have more knowledge and it will contribute to increase self-confidence based on the information. In addition, the information clues have also positively influence on concern for health. If customers get many information about healthy foods they are willing to worry about their health and they to choose a healthy foods in a restaurants.

Second, current study confirmed that subjective knowledge is significant predictor of health concern as well as customer satisfaction. These theoretical findings are also logically supported by previous study. For example, Lee et al [50] revealed that the subjective knowledge was critical predictor of health concern as well as behavioral intention among U.S. and South Korea college students. Therefore, managers of full-service restaurants need to make an effort to improve consumers' subjective knowledge form. One of suggestions is that develop detailed menu plate including various nutritional information and keep send useful information about healthy foods by email or text message. These efforts can contribute to increase consumers' self-confidence about their knowledge and it will help to make positive concerning about health. In sum, any consumers who have sufficient knowledge and positive con-

cerning about health are more satisfied than others, it will influence on consumers' behavioral intention. Furthermore, foodservice companies can invest to advertise their healthy foods using mass media. Specifically, they can use developed technology to provide information regarding healthy foods. For instance, modern people are getting various information through applications on smart phone, so if marketers provide valuable information using the technical tools, it will help to consumers' subjective knowledge of healthy foods and bring business success.

Despite the meaningful contributions the present study may serve, a little limitations exist. First, this study considers only american people, so the results may not be representative of all populations. Second, this study considers the knowledge subjectively. If future study can estimate objective knowledge of healthy foods as well, it can provide insightful information.

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