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The Use of Nutrition Label on Food Purchasing Decision among University Students in Kuantan, Malaysia

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ABSTRACT: Nutrition label provides nutrition status of the pre-packaged foods and is very useful for people when making decision for healthy foods. However, there is a lack of awareness among Malaysians regarding the use of nutrition label when purchasing foods. Hence, a cross sectional study among tertiary students (IIUM) was conducted. The aim of this study was to determine the relationship between gender, attitude and knowledge of the tertiary students with the use of nutrition labeling. Assessments were done by distributing 25-item questionnaires composed of pair-wise, open-ended and 5-item Likert scale questions to the subjects. The prevalence of level of nutrition knowledge and attitudes were determined. Our analysis showed that 95 students (57.6%) were moderately making use of the nutrition label. There was no significant difference between gender and the use of nutrition label on food purchasing decision among these students. There was also no association between knowledge and the use of nutrition label on food purchasing decision among them. However, there was significant association between attitude and the use of nutrition label on food purchasing decision among the students (p= 0.001, r= 17.842). Our results show that attitude is the key factor in regards with the use of nutrition label while gender and knowledge has no effect on the use of nutrition label on food purchasing.

Keywords: Food purchasing, healthy food, gender, nutrition label, questionnaires.

Introduction

Most of the food products available in the market are high in calories, fat, refined carbohydrates and sodium. These products if consume excessively can lead to obesity and other obesity related diseases (Joint WHO/FAO, 2003). USDA Continuing Survey of Food Intake has evaluated the impact of the use of nutrition label on consumer's intake of selected nutrients, and reported that reading nutrition label decreased calories intake from total fat (6%), saturated fat (2.1%), cholesterol (67.6 mg) and sodium (29.6 mg) (Kim *et al.*, 2000). Chronic diseases associated with these contents can be prevented by the appropriate use of food labels, especially in normal and healthy people. The public should be aware of this and make wise decision while purchasing foods as the first step to eat healthily. Consumers shall be informed on the nutrition content of each product. Thus, nutrition labeling is one of the best solutions in providing the essential nutritional information of a product.

Nutrition labeling is a fact statement of the energy amount and nutrients on the food product's label (Tee, 2011). The use of nutrition fact label among the consumers depends on several factors. Knowledge and attitude are the two key factors affect the frequency of nutrition fact

label reading while purchasing. Basic knowledge in nutrition is essential for consumers to understand the use of nutrition facts on the label for choosing a healthy diet (Guthrie *et al.,* 1995; Lin *et al.,*2004). Consumers with good nutrition knowledge were reported to be more likely to use the nutrition label when shopping for foods (Wardle *et al.,* 2000; Barreiro-Hurlé *et al.,* 2010). Attitude towards nutrition fact label, which includes usefulness, accuracy and truthfulness acts as a mediator for label reading behavior and nutrition knowledge (Misra, 2007). Moreover, the increasing emphasis on the importance of nutrition has made consumers more concern about nutritional information, especially on foods they wish to avoid (Shine *et al.,* 1997).

Nutrition fact labeling has been made compulsory for selected foods in Malaysia since 2003 (Tee, 2007). The increasing rate of chronic disease each year costs a great amount of money for the health care system as well as valuable life. Obesity is one of the main causes. One way in tackling unhealthy eating is by encouraging consumers to use nutrition fact label while purchasing food. However, data regarding the use of nutrition fact label among Malaysians such as its affecting factors are still limited. Hence, this study aims to determine the factors, i.e. knowledge and attitude, on the use of nutrition fact label among the tertiary students majoring in health care courses. We chose health care students as the subjects for this study because they are knowledgeable about healthy eating and were assumed to have high awareness on the use of nutrition fact label.

Materials and Methods

Research Design

A cross sectional study was carried out among the students of International Islamic University Malaysia (IIUM) at Kuantan Campus. The survey was taken place at several locations including the cafeteria of student hostel (Mahallah Talhah), convenient store at student hostel (Mahallah Maimunah) and at the library. Cross sectional study was fairly quick and easy to perform for the determination of the prevalence of nutrition label use on food purchasing decision among IIUM Kuantan Campus students.

Subjects Inclusion criteria

A total of 165 undergraduates IIUM Kuantan Campus students from first year to fourth year in each course, aged 18-24 years and Malaysian citizen were chosen to participate in this cross-sectional study. Using a precision of 0.05 at a 95% confidence interval, the minimum sample size was calculated by a single proportion formula. A non-probability sampling method (convenience sampling) was used to sample all of the campus students (n = 165) and all of them volunteered to complete the questionnaire. Ethical approval was obtained from the university before this research was carried out. The questionnaires were distributed to the students during the day of data collection and were collected back on the spot. At-that-moment return of the questionnaires is the most encouraged method to be used to ease the process of data entry. Students were assured that their participations were voluntarily and the questionnaires were anonymous.

Questionnaire

The English administered questionnaire for the survey was constructed and modified based on two studies done by Barreiro-Hurle *et al.* (2010) and Marietta *et al.* (1999). The 25-item questionnaire composed of four sections, which are the demographics, knowledge, attitudes and the use of nutrition label. Participants' demographics included age, course, gender and year of study. Knowledge section consists of nutrition related questions such as serving recommendation of fruits and vegetables by Malaysia Food Pyramid, and identifying products that contain more fat and cholesterol. Attitude section consists of questions on the validity, accuracy, understandability, health claim and nutrition claim of the nutrition food label. The respondent answered by using Likert scales, i.e. strongly disagree, disagree, no opinion, agree or strongly agree. The use of nutrition label section was assessed based on a list of five answers which are never, rarely, sometimes, often or always. The respondents were asked whether they made use of every single statement stated in the nutrition label of foods such as serving size, calories, fat, protein, carbohydrate, saturated fat, cholesterol, sodium, dietary fiber, sugar, vitamin A, vitamin C, calcium and iron.

Statistical Analysis

SPSS (Statistical Package for Social Sciences) version 17.0 was used to perform the statistical procedures. Two pair-wise and open-ended questions were used to determine the student's nutrition knowledge level. For each question, a correct answer was assigned as 1 and a wrong answer was assigned as 0. The scores were total up and were categorised into 4 groups of knowledge level namely the highest knowledge level (4), medium knowledge level (3), low knowledge level (2) and the lowest knowledge level (≤1).

Attitudes scores range from 7 to 25 were categorised into 3 groups namely poor (7-12), moderate (13-18) and good (19-25). The use of nutrition label scores range from 17 to 85were categorized into 3 groups; poor (17-39), moderate (40-62) and excellence (63-85). Data was analysed using descriptive method and chi square test in which the statistical significant level was set at $p < 0.05$. The categorical variable results are presented as frequency and its percentage and the numerical variable results are presented as the Mean ± SD. Descriptive statistics were conducted for the demographics variables, nutrition knowledge, attitudes towards nutrition label and its use. Chi square test was conducted to determine the association between gender, knowledge and attitudes of consumer regarding the use of nutrition label.

Results

Subjects demographics

Table 1 shows that the respondent's age ranged from 18-24 years with Mean ±SD age of 22.51± 1.198. For gender distribution, 43 (26.1%) of the respondents were male while female respondents were 122 (73.9%). Distribution of the students in the study population samples were 67 (40.6%) from Kulliyyah of Allied Health Sciences (KAHS), 44 (26.7%) from Kulliyyah of Sciences (KOS), 8 (4.8%) from Kulliyyah of Medicine (KOM), 32 (19.4%) from Kulliyyah of Dentistry (KOD), 4 (2.4%) from Kulliyyah of Nursing (KON) and 10 (6.1%) from Kulliyyah of Pharmacy (KOP). The distribution of the students according to the year of studies were as

follows: 25 from the first year (15.2%), 46 from the second year (27.9%), 80 from the third year (48.5%) and 14 from the fourth year (8.5%).

Table 1: Demographic characteristics of IIUM Kuantan Campus students

Characteristics	N (%)	Mean ±SD
Age		22.51± 1.198
Sex		
Male	43 (26.1)	
Female	122 (73.9)	
Course		
KAHS	67 (40.6)	
KOM	8 (4.8)	
KOP	10 (6.1)	
KON	4 (2.4)	
KOD	32 (19.4)	
KOS	44 (26.7)	
Year		
1	25 (15.2)	
2	46 (27.9)	
3	80 (48.5)	
4	14 (8.5)	

Knowledge, Attitude and the Use of Nutrition Label

Table 2 shows that majority of the respondents, 68 had low nutrition knowledge level. The mean score was 55.5% (of a possible 4 points; mean ± SD score = 2.22 ±0.944).

Table 2: Prevalence of level of nutrition knowledge of IIUM students

Knowledge	N (%)
Highest	19 (11.5)
Medium	38 (23.0)
Low	68 (41.2)
Lowest	40 (24.2)

The mean score for attitude towards nutrition label use was 17.45 ± 2.914, which was insignificantly different from the mean score (17.3 ± 2.7) of the previous study by Marietta et al. (1999) on college students in the United States of America. **Table 3** shows that majority of the respondents, 96 (58.2%) has moderate attitude towards the use of nutrition label.

Table 3: Prevalence of attitudes regarding the use of nutrition label

Attitude score	N (%)
Poor	10 (6.1)
Moderate	96 (58.2)
Good	59 (35.8)

Majority of the respondents (57.6%) moderately made use of the nutrition label. 75% of the respondents were moderate and excellent nutrition label users, **Table 4**. Our results indicate a slightly lower percentage of respondents using the nutrition label (78%) as compared to a previous study (Satia, 2005).

Table 4: The prevalence of using nutrition label among IIUM Kuantan students

The use of Nutrition label	**N (%)**
Poor	42 (25.5)
Moderate	95 (57.6)
Excellence	28 (17.0)

The association between gender and the use of nutrition label

There was no significant difference between gender and the use of nutrition label on food purchasing decision among IIUM Kuantan Campus students (p = 0.211). Based on **Table 5**, majority of male students, 20 (46.5%) and female students, 75 (61.5%) moderately read the nutrition label. Only 23.3% of male and 14.8 % of female respondents was excellence nutrition label user. This shows that gender did not affect the use of nutrition label among students. Nevertheless, Satia *et al*. (2005) found that the use of nutrition label was significantly higher among women participants (82% vs 73%, $p< 0.05$).

Table 5: Comparing the use of nutrition label on food purchasing decision between male and female of IIUM Kuantan Campus students

Variables		**Gender** **N = 165** **No. (%)**			
		Male N= 43	Female N = 122	Chi-square statistics (df)	*p*-value
The use of Nutrition label	Poor	13 (30.2%)	29 (23.8%)	3.112 (2)	0.211
	Moderate	20 (46.5%)	75 (61.5%)		
	Excellence	10 (23.3%)	18 (14.8%)		

The association between knowledge and the use of nutrition label

There was no association between knowledge and the use of nutrition label on food purchasing decision among IIUM Kuantan students (p = 0.121) (**Table 6**). These results indicate that both consumers with the lowest or the highest level of nutrition knowledge will read nutrition label when purchasing food. However, Barreiro-Hurle *et al.* (2010) and Misra (2007) reported that nutrition knowledge was positively associated with the use of nutrition label. This might due to

label reading behavior was mediated by attitude, and knowledge alone was insufficient to have impact on the use of nutrition label (Misra, 2007).

Table 6: The association between knowledge and the use of nutrition label on food purchasing decision among IIUM Kuantan Campus students

Variables		**Knowledge N = 165 No. (%)**					
		Lowest N= 40	Low N = 68	Medium N = 38	Highest N =19	Chi-square statistics (df)	*p*-value
The use of Nutrition label	Poor	14 (35.0%)	20 (29.4%)	5 (13.2%)	3 (15.8%)	10.078 (6)	0.121
	Moderate	19 (47.5%)	34 (50.0%)	28 (73.7%)	14 (73.7%)		
	Excellence	7 (17.5%)	14 (20.6%)	5 (13.2%)	2 (10.5%)		

The association between attitude and the use of nutrition label

There was a significant association between attitude and the use of nutrition label on food purchasing decision among IIUM Kuantan Campus students (p = 0.001) (**Table 7**). These results indicate that consumers with good attitude are more likely to use nutrition label when purchasing food. These results was aligned with studies done by Misra (2007) and Marietta *et al.* (1999) who conducted their studies at two Midwestern universities at America.

Table 7: The association between attitude and the use of nutrition label on food purchasing decision among IIUM Kuantan Campus students

Variables		**Attitude N = 165 No. (%)**			
		Poor N= 106	Good N = 59	Chi-square statistics (df)	*p*-value
The use of Nutrition label	Poor	34 (32.1%)	8 (13.6%)	17.842 (2)	0.001
	Moderate	63 (59.4%)	32 (54.2%)		
	Excellence	9 (8.5%)	19 (32.2%)		

Discussions

The main purpose of a nutrition label is to assist consumers to make an informed decision while purchasing foods in the market. However, it will not benefit the consumers in adopting healthier diets that will eventually reduce the risk of disease if it has not been use frequently. Gender,

knowledge and attitude are the three main factors have been reported in many studies. The present study showed that the mean knowledge level among IIUM students was moderate (55.5%), which may explain why the majority of them have moderate attitude (58.2%) towards the use of nutrition label (**Table 2** and **Table 3**). These two factors are complementary to each other.

An increased interest in nutritional importance in recent years is evident (Shine *et al.,* 1997). The studies by Kreuter *et al*. (1997) and Perez-Escamilla *et al*. (2002) highlighted the importance of attitudes in examining the effectiveness of food labels on nutrition knowledge. Majority of the students are moderate and excellence users of nutrition label (74.6%) (**Table 4**). This value is higher compared to a study involving educated young adults in UiTM Puncak Shah Alam, Selangor, Malaysia where 46.4% of the respondents claimed of using nutrition label (Norazmir *et al*., 2012). This difference might due to the differences in education background of subjects between these two studies. Note that, the UiTM study also included students from Faculty Office Management and Technology, which is not related with health science.

Female was reported to be more likely to use nutrition label in comparison to male (Marietta *et al.,* 1999; Kim *et al.,* 2000; Satia *et al.,* 2005). This supports the present study finding where majority of the female students (61%) claimed using nutrition label moderately (**Table 5**). However, more male students (23.3%) are excellent user of nutrition label in comparison to the female students (14.8%). Similar result was found among UiTM Puncak Shah Alam students, where 28.1% male claimed to be frequent users of nutrition label in comparison to only 20.2% female (Nurliyana *et al.,* 2011). The researchers speculated that the female students might have limited time to spend on reading nutrition label every time they go for shopping, as their study loads used up most of their time. On the other hand, both studies reported insignificant association between gender and the prevalence of using nutrition label among students.

The knowledge level of consumers plays a vital role for their ability to use nutrition label while purchasing food. This is because consumers with higher education are more likely to use the nutrition label as they understand better, which later will be interpreted into their healthy diet (Barreiro-Hurle *et al*., 2010). Several studies supported this finding that there was a strong relationship between knowledge levels of consumers with the frequent use of nutrition label (Guthrie *et al.,* 1995; Marietta *et al.,* 1999; Fitgerald *et al*., 2008). However, there was no significant association between knowledge level and the use of nutrition label among students found in this study (**Table 6**). Study among students at UiTM Puncak Alam, Selangor, Malaysia also reported the same finding in year 2011 and 2012 (Nurliyana *et al*., 2011; Norazmir *et al*., 2012). The reasons might be that the students consider other factors as more important than the nutritional status while purchasing foods. Besides knowledge and attitude, degree of awareness, trust ability, product price, health consciousness, safe consciouness, government involvement and manufacturing practices also influence the decision in purchasing foods namely the utilisation of nutrition labeling (Rezai, 2005). This is proven by UiTM Puncak Alam's study which reported that the main factors affecting their decision in purchasing food were expiry date followed by taste, ingredient, price, nutrient content and packaging (Nurliyana *et al.,* 2011). It is also likely that the students are less concern about adopting healthy eating (Norazmir *et al.,* 2012).

The positive attitude of the consumers towards healthy eating is also known to increase the frequency of using nutrition label while purchasing as reported by Marietta *et al.* (1999) and Misra (2007). As consumer's interest towards nutritional content of food increase, they will be more alert to the nutrition label in order to know more about it (Richardson, 1993). Our finding is consistent with the previous studies, where there was a significant association between attitude and the use of nutrition label among students (p=0.001) (**Table 7**). Study in UiTM Puncak Alam had further reaffirmed this association indicating that positive attitudes were due to the understanding of the facts on the nutrition label (63.2%), followed by for health or beauty, concern about taste and price, to control energy intake, to avoid food allergy, and lastly the 'halal' issue (Nurliyana *et al.,* 2011).

Many students found that the nutrition label was not attractive and confusing (Nurliyana *et al.*, 2011). The students were usually confused about the percent daily value, energy requirement and the recommended intake of major nutrients (Norazmir *et al.*, 2012). Based on these findings, the attitude among educated young adults could be improved by increasing their understanding on the meaning of each facts provided on the nutrition label.

Conclusions

Our study provides the prevalence of nutrition knowledge level, attitudes and the use of nutrition label on food purchasing decision among IIUM Kuantan Campus students. Most of IIUM Kuantan Campus students have low nutrition knowledge. Meanwhile, more than half (58.2%) of students have moderate attitude towards the use of nutrition label. The prevalence of using nutrition label among IIUM Kuantan Campus students were mostly moderate (57.6%), followed by poor (25.5%) and excellence (17.0%). There was a significant association between attitude and the use of nutrition label on food purchasing decision among IIUM Kuantan Campus students (p = 0.001). Hence, more efforts to increase positive attitude among educated young adults can help to improve the frequency using of nutrition label.

This study has several limitations. The study used a cross-sectional research design that cannot be used to indicate causality. Our study may not represent the general student population in all college or university of this country because all of the respondents were from health based programmes. In addition, the information of knowledge, attitude and the use of nutrition label can be overestimated or underestimated by respondents. Future studies should examine the effects of using nutrition label on respondent's dietary intake, BMI, and health status as well as the role of nutrition knowledge in their daily life.

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