

Nutritional Level: Do Consumers in Kota Bharu, Kelantan Understand?

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The issues of diet-related health have risen dramatically in Malaysia. Nutrition information is important for consumers to use the information to make healthier food choices. The purpose of this study is to identify the factors that influence the understanding of nutrition information among consumers in Kelantan. A cross-sectional study was conducted to collect data from a total of 400 consumers who were conveniently selected in Kelantan through a close-ended questionnaire. The result showed that 58.8% (n=235) of the respondents had a good understanding while 26.5% (n=106) of them had an average understanding. Furthermore, the results revealed a significant relationship between age (p=0.012), education (p=0.000), employment status (p= 0.000), and income (p=0.021) with the level of understanding of nutrition information. However, there was no significant relationship between gender (p=0.62) and health status (p=0.122) with the level of understanding of nutrition information. In fact, there was a significant relationship between nutritional values and level of understanding of nutrition information (the nutrition value $r = -0.134^{**}$, p=0.007). This study provides recommendations for consumers and manufacturers to improve the identified weakness in order to increase comprehension towards the messages of nutrition information.

Key words: *Nutritional labels, consumers in Kelantan, employment status, health status, education levels.*

Introduction

With unhealthy diet and lifestyle, many Malaysians have experienced chronic diseases such as obesity and diabetes. There has been robust evidence provided to prove that dietary factors are related to obesity and heart disease (Lichtenstein et al., 2006; World Health Organization 2016; Veneis and Wild, 2014). According to the National Health and Morbidity Survey of 2015, 17.7% of the Malaysian population were obese while 30% were overweight. The prevalence of obesity increased drastically from 4.4% in 1996 to 17.7% in 2015. This statistic indicates that the prevalence of adults who were overweight was 30%. The percentage of Malaysians considered obese has increased from 4.4% to 14% in 20 years (Scawen et. al, 2016).

Due to rapid economic growth in Malaysia, there are obvious changes in food consumption behaviour among consumers. Consumers tend to buy instant food with high calorie and dietary fat, which is indication that they will gain excessive weight (Brownell, 2004; Mancino et al., 2009; Dietary Guidelines Advisory Committee, 2010; Nguyen and Powell, 2014; Pereira et al., 2005). In fact, a strong demand of instant food may increase the importance of nutritional labelling. Therefore, the concept of nutritional labelling should be studied to help consumers understand the information better. The labels on the food packaging clearly state nutritional values of food products. All nutrition labels are provided per 100 gram and per pack or per serving size (Graham et. al, 2012; Wie, Aidoo, & Sorensen, 2017). The nutritional labels help consumers to control their nutrient intake in meals for example the need to lessen fat and sugar intake and increase protein. Consumers are also encouraged to refer to nutritional labelling before selecting their food of choice (Grunert et al., 2010).

Although nutrition labelling is crucial for consumers, it is impossible for them all to understand the content of the label. Grunert et al. (2010) found that consumer understanding of nutrition labelling was very low. This is because consumers also make choices based on taste, eating habits and indulgence (Grunert et. al, 2007). In fact, consumers who are interested in taste tend to ignore consideration of nutrition, thereby having a poor understanding of the nutrition labelling. Consumer understanding of nutrition labels can be determined by individual characteristics, situational factors and product class involvement in food selection. According to Norazmir et al. (2012), there are several factors influencing the level of consumer understanding of nutrition labeling including gender, income status, age, physical environment and job. The main purpose of this study is to investigate consumer understanding of nutritional labels to identify the effectiveness of this information when making a healthier food choice.

Literature

Food labelling is a legal requirement, which has to be fulfilled by manufacturing companies for improved consumer health and safety (Ababio et al., 2012). According to Graham et.al (2012), a nutritional label is a tool to convey the nutrition information in table form and it is known as 'nutrition facts'. The nutrition label clearly states the nutrition values of the food

product such as calorie and other nutrient content. Nutrition information is important to consumers due to the fact that the nutrition label can lead consumers to make a better food choice. Better food choices mean the consumer can make decisions efficiently, easily and correctly when comparing food products (Jabs et. al, 2006). Therefore, consumers can clearly understand the nutrients contained in the food product. Food labels are beneficial for fulfilling immediate and future food related needs as well as to guide the consumer in changing buying decision behaviour from an unhealthy to healthy choice and further, nutritional information assists in informed choice decision (Liu et al., 2015).

Recent research indicates that creating awareness among consumers regarding nutritional food labelling enhances consumer skill in selecting correct and healthy food (SubbaRao, Vijayapushpam, Venkaiah and Pavarala 2012). Therefore it would not be wrong to state that food labels can be a formal platform to educate and build consumer awareness regarding nutritional information for consumer's better health and diet. Food labelling is considered to be a bridge between consumer and producer in communicating healthy information and also a support to consumer in increasing dietary quality (Jordan Lin et al., 2004).

A previous study reported that food labels inspire consumers during food purchase, to compare with other food items (Butkevičienė et al., 2008). However, the increasing number of manufacturers and availability of a variety package foods in store have caused consumer confusion in making smart decisions. Therefore, food labels with nutritional information have simplified the consumer decision making process and also assist consumers in making better food choice (Wizarat, & Hye, 2010; Prinsloo et al., 2012). In some studies, researchers observed that in the busy lifestyle of the consumer, nutritional information is very helpful for making healthy food decisions. Accordingly an easy method to educate nutrient information to the end consumer has been found (Vijaykumar et al., 2013).

Recent evidence suggests that the understanding and interpretation level of nutritional information varies among consumers (Saha et al., 2013). Individual characteristics are the factors to differentiate among individuals in the population based on age, race, gender, economic status and level of education. According to Cheah et. al (2015), individual characteristics are well known as one of the factors that influence the understanding of nutritional information. There are several previous studies identified that investigate how attitudes towards nutrition information are influenced by several individual characteristics including gender, age, and education level (Josiam et. al, 2009; Cheah et. al, 2015). For instance, Ranilovic et.al, (2011) believed that age and education level significantly influence the use and understanding of nutritional information.

Age

Age has a positive relationship to understanding of nutrition information due to the comprehension accuracy (Adams et. al, 2006). Increased age may result in an increase in concern about nutrition and health (Josiam et. al, 2009). For example, Adams et.al (2006) found that younger consumers have a lower awareness of health and that older consumers are well informed and understand nutrition information. However, Themba et.al. (2013) found that older consumers are more likely to have better understanding and awareness of nutrition and health. A recent study by Cheah et.al, (2015) concluded that the conflict on insights between the relation of age and understanding to nutrition information is that older consumers were unwilling to change their lifestyle.

Gender

Hansen et.al (2010), found that gender has a positive relation to nutrition awareness and that females has greater nutrition awareness than males, females were found to express the need for nutrition information during their daily life (Dissen et. al, 2011). Therefore, females were more likely to understand and study nutrition information and to have a better understanding of nutrition information than males (Adams et. al, 2006; Josiam et. al, 2009; Cheah et.al, 2015). Moreover, Grunert et.al (2012) found that females are more concerned and interested in awareness of health, diet and their body image which may lead to their increased understanding of nutrition information and knowledge compared to males. According to Cheah et.al (2015), Malaysian females are more likely to use and understand nutrition information and this is similar to other countries such as Turkey and China.

Education Level

According to Themba et.al (2013), education level will influence the understanding of nutrition information and consumers with higher education levels have better understanding of nutrition information. They also found that those who are unaware of nutrition as a concept, lack knowledge about nutrition. Consumers with higher education level will be more likely to use and understand nutrition information (Cheah et. al, 2015). Adams et. al (2006) also found that the gaps in consumer knowledge directly influence the awareness of health and understanding of nutrition information; the higher the education level, the higher the nutritional awareness and consequently the more likely the knowledge base and understanding of nutrition information.

Income Status

Income is defined as the amount of earnings obtained from various kinds of sources such as compensation, wages and salaries, rental earnings and dividends during a given time period (Masud et. al, 2008). Most research highlights the positive relationship between income and understanding in the context of nutrition information (Jauregui et. al, 2007; Larney et. al, 2011;

Hieke et. al, 2012; Graham et. al, 2012). Individuals with high income are significantly more familiar with and evidence a deeper understanding of the use of food labels (Bazhan et. al, 2015) when processing nutrition information. They use nutritional information frequently and have better comprehension regarding nutrition. A study by Mahgoub et. al (2008) also found that the level of understanding of nutrition information increases in correlation to income. However, the survey conducted by Drichoutis et.al, (2006) indicated that the correlation between income and food label use is not obvious and this is inconsistent with other studies.

A person with low income places more emphasis on the food product price and thus pay less attention to considering nutritional information (Rose et. al, 2012). Low income affected the frequency of food label use and thus decreased the understanding of nutritional information respectively (Ollberding et. al, 2011). A study conducted by Aygen et.al. (2012) interrogated the relationship between income and nutrition information knowledge. These findings show that a significant effect exists where high income has a lower frequency of food label use compared to middle and low income.

Health Status

Individual understanding of nutrition information is affected by health status (Samson et. al, 2012). Health status is defined as the state of health-related quality of life or physical condition (Bircher et. al, 2005). Early research was conducted to examine the association between health status and food label use (Lewis et. al, 2009). The results showed that people with poor health status were more concerned and used the food label more often. For instance, individuals with diabetes or obesity were found to use the nutritional information frequently and thus be more knowledgeable regarding nutrition information.

Moreover, a study conducted by Azila-Gbettor et.al (2013) agrees that an individuals' health status affects their investigation of nutrition information. With regard to health status, persons with hypertension, cancer and diabetes evidenced stronger association with food label use. They make use of food labels frequently and thus have a high level of understanding with regard to nutrition information (Ollberding et. al, 2011). Furthermore, there is a connection between obesity and usage of nutrition label. An obese individual places more emphasis on calorie information as does a person with high cholesterol (Bayar et. al, 2009). A number of researchers have reported that consumer understanding and usage of food label improve the dietary quality of consumers (Jordan Lin et al., 2004), increase the consumption of fruit and vegetable (Campos et al., 2011) and reduce the energy intake (Temple & Fraser, 2013).

Materials and Methods

Study Population

Men and women of the main ethnic groups, Malay, Chinese and Indians aged 18 to 59 years old were invited to participate in this study. The respondents were classified by age into younger adults (18 to 29 years) and older adults (30 to 59 years). This research used a convenient sampling method, 400 respondents were recruited in this study. There are five main chain supermarket in Kelantan that agreed to participate in the study. The sites were located in the following neighborhoods, Pengkalan Chepa and Kota Bharu. Subjects who did not understand either Bahasa Malaysian or English were excluded from the study.

Data Collection

This was a cross-sectional study carried out from January to December 2016. The questionnaire was developed and pre-tested among consumers in Kota Bharu, Kelantan. The results of the pre-test were used to improve the validity of the questions. The final questionnaire comprised questions on socio-demographic and 15 close-ended questions regarding the understanding of nutrition labelling. The level of understanding was determined according to the cumulative scores, in which a score of less than 50 was considered poor, a score of between 51 to 74 was considered moderate, while a score of more than 75 was considered good (Department of Nutrition and Dietetics, UKM 2004).

Data Analysis

All statistical analyses were performed using SPSS version 22. Descriptive statistics such as frequency and percentage were used to describe the data. Correlation analysis was used to examine the association between the factors affecting understanding on nutritional label and the score achieved.

Results

Most respondents (91%) completed the self-administered questionnaire, but the remaining 9% of the questionnaires were incomplete and excluded. Table 1 presents the distribution of respondents according to demographic background.

Table 1: Socio-demographic background

Demographic Profile		Frequency (N=365)	Percent (%)
Gender	Male	144	39.5
	Female	221	60.5

Age	18-24 years old	203	55.6
	25-39 years old	103	28.2
	40-59 years old	59	16.2
Race	Malay	187	51.2
	Chinese	112	30.7
	Indian	59	16.2
	Others	7	1.9
Marital status	Single	267	73.2
	Married	97	26.6
	Others	1	0.2
Educational level	SPM	84	23.0
	STPM	59	16.2
	Diploma	47	12.9
	Bachelors	158	43.3
	Master	15	4.1
	Ph.D	5	0.5
Income status	Low (< RM999)	199	54.5
	Moderate (RM1000- RM3000)	132	36.1
	Higher above RM3000	34	9.4
Employment status	Employed	120	32.9
	Unemployed	23	6.3
	Self-employed	30	8.2
	Student	174	47.6
	Retired	10	2.7
	Others	8	2.3

Of 365 respondents, 39.5% of them were men whereas 60.5% were women from the age of 18 to 59. Approximately 51.2% of the respondents were Malays, 32.7% were Chinese and 16.2% were Indians. In addition, 73.2% of them were single while 26.6% were married. In terms of educational background, 43.3% of the respondents had a bachelor degree, 12.9% had a diploma and 4.1% had a Masters. The majority of the respondents (54.5%) were low-income earners,

36.1% were moderate income earners, while the remaining 9.4% earned high income. In terms of employment, 47.6% of the respondents were students, 32.9% were employed, 8.2% were self-employed, 6.3% were unemployed and 2.7% were retired.

Understanding the messages of nutrition labelling

Total marks were used to determine the level of understanding of nutrition information according to different understanding levels. Respondents who obtained more than 75 marks had a good understanding. Those who obtained 50 to 75 marks had a moderate understanding, while those who obtained less than 50 marks had a poor understanding. In a nutshell, 54.7% of the respondents achieved higher score, 29% of the respondents with moderate understanding achieved a score of 51% to 74%. The rest (16.3%) with poor understanding, had a score less than 50%.

Table 2: Level of understanding of nutrition information among consumers in Kota Bharu, Kelantan

	Frequency (N=365)	Percent	Cumulative percent
Good understanding	200	54.7	54.7
Moderate understanding	106	29	83.7
Poor understanding	59	16.3	100
Total	365	100	

Factors affecting the understanding of nutritional labeling

The results reveal a significant relationship between age ($p=0.012$), education ($p=0.000$), employment status ($p=0.000$) and income ($p=0.021$) with the understanding of nutrition information among adults in Kelantan. However, there was no significant relationship between gender ($p=0.62$) and health status ($p=0.122$) with the understanding of nutrition information. However, there was a significant relationship between perceived value of nutrition and understanding of nutritional information ($r=-0.134^{**}$, $p=0.007$)

Discussion

Based on the results, 54.7% of the respondents can understand the nutrition label clearly. This finding is similar to Prieto-Castillo, Royo-Bordonada, and Moya-Geromini (2015) who reported that consumers did not fully understand the nutritional labelling. Some studies have suggested that individuals who read and understand the nutritional labels are more likely to have a high consumption of fruit and vegetables and low consumption of fats and high cholesterol foods (Campos, Doxey, and Hammond, 2011; Kreuters, Brennan, and Scharff,

1997; Satia, Galanko, and Neuhouser, 2005). Almost half of the respondents did not fully understand the nutrition labels. 26.5% of them had an average understanding of nutritional labels, while 16.3% had a poor understanding of nutritional labels. Most consumers were interested in information about additives and fats. The ability to interpret the nutrition labels is highly associated with previous knowledge on the topic (Rothman et.al, 2006; Jay et al., 2009).

Factors affecting the understanding of nutritional labeling

Based on the findings, there was a significant relationship between age and level of understanding of nutritional labeling ($p=0.012$). Robust evidence shows that increasing age affects consumer understanding concerning the messages on the nutrition labeling (Chen et al., 2012, Besler et al., 2012; Satia, Galanko, & Neuhouser, 2005; Souza et al., 2011; McArthur, Chamberlain, & Howard, 2001). This may be because older consumers believe in the knowledge they have built over time compared with scientific evidence such as nutrition information (Cheah et al., 2015).

Some studies have noted that nutrition labeling influences food purchasing decisions of women who always trust the labels (Kim, 2009; Keuter et al., 1997). They pay more attention to nutrition value than men (Chen et al., 2012; Besler et al., 2012). In this study, there is no significant relationship between gender and level of understanding of nutritional labeling ($p=0.62$). The findings show that individuals with high income maintain their health consistently as compared to those with low income. There was a positive relationship between income and employment with level of understanding of nutrition information ($p=0.021$). Previous studies have also reported that there is a significant relationship between income and understanding of nutrition information (Jauregui et al., 2007; Larney et al., 2011; Hieke et al., 2012; Graham et al., 2012).

Consumers with higher income often rely on food labels (Bazhan et al., 2015) to understand nutrition information better. Mahgoub et al. (2008) found out that the level of understanding of nutrition information increased as income increased. However, Drichoutis et al. (2006) findings indicated that the relationship between income and the use of food label was not consistent with other studies. In fact, consumers with low income looked at the food product price rather than other criteria. They pay less concern to nutrition information (Rose et. al, 2012). Those with low income did not rely on food labels frequently, thus having a weak understanding of nutritional information (Ollberding et al., 2011). Nevertheless, Aygen et al. (2012) reported a significant relationship between income and nutrition information knowledge which means that high income consumers did not use food labels regularly as compared to middle- and low-income consumers.

A consumer's understanding of nutrition information can be affected by health status (Samson

et al., 2012). Early research showed that consumers with poor health used food labels more often (Lewis et al., 2009). For instance, individuals with diabetes or obesity found that the nutritional information increased their knowledge about nutrition. Inconsistent with this study is the finding that the understanding of nutritional information was not affected by the health of consumers. Based on the finding, there was no significant relationship between health status and level of understanding of nutritional labeling ($p=0.122$). In contrast, Azila-Gbettor et al. (2013) agreed that individuals' health status affected the nutrition information search. Individuals with hypertension, cancer and diabetes were found to strongly associate with food label usage. They made use of the food label to gain a better understanding of nutrition information (Ollberding et. al, 2011). In addition, there is a connection between obesity and use of nutrition label where it is indicated that an individual with obesity and high cholesterol does rely on calorie information (Bayar et al., 2009).

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Conclusion

In conclusion, this study has shown that almost half of the respondents did not fully understand the messages stated on the nutritional label. The results reveal a significant relationship between age ($p=0.012$), education ($p=0.000$), employment status ($p= 0.000$), and income ($p=0.021$) with the level of understanding of nutrition information. However, there was no significant relationship between gender ($p=0.62$) and health status ($p=0.122$) with the level of understanding of nutrition information. Therefore, these kind of results indicate that more efforts are required and that consumer behaviour still needs to be investigated with respect to food label usage, understanding and even awareness of the purpose of food labelling. Therefore, this study provides recommendations for consumers and manufacturers to improve an identified weakness based on factors investigated in order to increase comprehension about the intent and value of nutrition information.

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