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Differences in the Consumer Literacy of the Nutrition Label across Demographic Factors

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ABSTRACT

The worsening obesity problem in Malaysia has urged various efforts from various parties to address them. The effective use of the nutrition labels is widely accepted and used as one of the efficient measures to address obesity. However, previous studies on the literacy of the nutrition label, especially among Malaysian consumers are still limited. Therefore, this study was conducted to assess the differences in consumers' literacy of the nutrition label by demographic factors, such as gender, age, education level, income level and ethnicity. This study adopted survey technique and employed a quantitative approach. The sample consisted of 200 respondents, which were selected using random cluster sampling. Data collected were analyzed using Independent Sample T-Test and Analysis of Variance (ANOVA). The results showed that the literacy of the nutrition label varies significantly by gender and ethnicity, but the difference was not significant by age, education level and income level. Specifically, the literacy of the nutrition label is higher among female and Malay. Although these findings provide useful information for designing education and motivation programs towards healthy eating habits among consumers and consequently reduce the obesity problem, this study is limited to a few factors that need for replication and improvements in other studies in the future.

Keywords:

nutrition labels, literacy, obesity, healthy eating habits

INTRODUCTION

Obesity is a major threat for almost all countries around the world (Aygen, 2012). In 2010, it was estimated that obesity had caused death of 3.4 million people (Ng et al., 2014), while in 2014, at least 2.8 million people died each year due to obesity (Gan, 2014). Although various steps have been taken by the government agencies and the non-profit organizations, global obesity rates continue to rise significantly (Ruzita, Li, Ismail, and Thavaraj, 2013). Specifically, at a global level, the number of individuals who are obese increased from 857 million in 1980, to 2.1 billion in 2013, with the percentage of 27.5% for adults and 47.1% for children (Ng et al., 2014). According to statistics released by the World Health Organization (WHO) (2015), more than 2.5 billion adults, aged 18 years and above, and 42 million children under the age of 5 are considered obese. Although obesity has long been regarded as a matter of high-income countries, in recent years, the obesity problem has been increasing in developing countries (World Health Organization, 2015). There is no exception for Malaysia, where the obesity epidemic was described as alarming (Rashidah, Balkish, Mohd Azahadi, Nor Azian, Syafinaz & Tahir, 2014). According to the National Health and Morbidity Survey (NHMS), the obesity rate has risen to almost three and a half times, that is, from only 4.4 per cent in 1996 to 15.1 percent in 2011 (The Nutrition Month Malaysia Secretariat, 2014). In addition, it was also reported that 38 per cent of the children in Malaysia are obese (Weight Loss Management, 2016), whereas 60 per cent of Malaysian adults have a Body Mass Index (BMI) over 25 kg/m², which was defined as being obese (World Health Organization (WHO), 2015). More critically, Malaysia has been reported to have the highest rate of obese people in the Southeast Asia and the sixth in the Asia (World Health Organization, 2015; Ng et al., 2014).

Binkley et al., (2000) found out that too much fast food consumption tends to contribute to obesity (Mohd Azlan, & Noraziah, 2011). Besides, genetic or hereditary may

also contribute to obesity (Puiu, Emandi & Arghirescu, 2013). According to The Nutrition Month Malaysia Secretariat (2014), obesity is caused by individual's unhealthy eating habits as well as lack of physical activity. In addition, obesity is also driven by inactive lifestyle, such as watching television or prolong use of the computer and other media without any sort of physical activity (Tan, Dunn, Samad & Feisul, 2011; Teo, Abdullah, Mohd Zane, Hills, & Foo, 2014). Mohd Yusof, Director of Communications of Malaysian Consumers Associations (FOMCA) also pointed out the significance of healthy lifestyle, especially in healthy food consumption, as the best tools to combat the obesity problem (Harian Metro, 2015). Moreover, WHO (2015) also made it clear that obesity among children and adolescents, it is largely due to the lack of physical and overeating.

Du Plessis, Cabler, McAlister, Sabanegh and Agarwal (2010) stated that obesity causes undesirable effects on a person's sexual health. Besides, obesity has a negative effect on economic growth and prosperity of the country due to high medical subsidies that government has to bear in order to solve the obesity problem (Lembaga Promosi Kesehatan Malaysia, 2011, 2011). Furthermore, the total number of sick leave will also increase and consequently affects productivity. It is even more critical when obesity causes deaths (Ng et al., 2014). In addition, obese individuals will suffer from psychological problem, particularly due to their physical appearance (Utusan Borneo, 2012), and various chronic diseases such as heart problems (The Nutrition Month Malaysia Secretariat, 2014).

Recognizing the significant increase in the obesity rate, prompt action to address the problem of obesity must be taken (Rashidah et al., 2014). Past research has shown that obesity can be prevented if a person makes healthy food choices and is always engaged in physical activity throughout their lives (Aygen, 2012; World Health Organization, 2012, 2015). Nutrition label has also been regarded as one of the main instruments for helping people to adopt a healthier eating habits and make better decisions in purchasing food (Barreiro-Burle, Gracia, & De-Magistris, 2010; Soederberg Miller & Cassady, 2015). However, changing the eating habits of an individual is not an easy task (Zheng, Xu and Wang, 2011). Hence, it is extremely important to make efforts to educate and motivate consumers on how nutrition labels can be used to assist them in choosing healthy foods. As to plan effective education program on the nutrition label, it is significant to investigate the nutrition label literacy among Malaysian consumers.

Due to the rise of obesity rate locally and globally, various measures have been taken to curb the problem. One of the measures that have been adopted is through the use of nutrition labels. This can be done by increasing the knowledge on nutrition labels, as well as encouraging the use of nutrition labels in making purchases and selecting food product. To effectively design and run the program to educate the consumers on the importance of nutrition label, much research has been done relating to nutrition label. However, the majority of the research has been focussing on the impact of nutrition label, particularly on reducing the obesity rate. Little research address literacy and use of nutrition labels across demographic factors (Washi, 2012; Ng et al., 2014 & Gan, 2014).

Up to now, the findings of existing studies on the differences in nutrition label literacy reported that the nutrition label literacy differs significantly across demographic factors. Specifically, nutrition label literacy varies significantly according to gender, age, education level, income level and ethnicity (Singla, 2010; Petrovici, Fearn, Jr. & Drolas, 2010; Zheng, Xu and Wang, 2011; Washi, 2012; Aygen, 2012; Norazlan Shah, Muhammad, Hasmira, Mashita, Norfazilah, & Fazlyla, 2013; Eckert et al., 2013; Choi, Rush & Henry, 2013; Ormshaw, Hakkari & Kannas, 2013). In the Malaysian context, studies that tackled the

differences in nutrition label literacy across demographic factors seem to be limited. So far, the results of the research have shown that the nutrition label literacy is significantly different with respect to income level (Cheong et al., 2013) and ethnicity (Rashidah et al., 2014).

Given the lack of studies conducted to evaluate the differences in nutrition label literacy among the Malaysian, a new study to delve into the issues is clearly warranted (Aygen, 2012). Therefore, it is deemed necessary to examine the differences in nutrition label literacy among Malaysians across demographic factors in order to identify the important segment that should be focused on in designing and conducting health education program, nutrition label and healthy food choices, which ultimately reduce the obesity problem. Thus, the main objective of this study is to investigate the differences in consumer' nutrition label literacy across demographic factors. Specifically, this study attempts to evaluate the differences in consumer nutrition label literacy across gender, age, education level, income level and ethnicity. This study is significant as to provide empirical evidence on the level of nutrition label literacy among Malaysian consumers, and identify the groups with low level of nutrition label literacy. Besides, this study provides important and useful information to stakeholders such as the government, the World Health Organization (WHO) and other related parties in developing effective educational and motivational programs to help consumers to understand the importance of nutrition labels and to utilize the nutrition label in selecting and purchasing healthy food that eventually contributes to the reduction of obesity in Malaysia. Furthermore, this study also reveals the target audience, who should be the main focus of each nutrition labels awareness and education program.

LITERATURE REVIEW

According to the World Health Organization (WHO) (2012), obesity refers to a change in weight that are not normal or excessive, i.e. with a Body Mass Index (BMI) of 30 kg/m² or more (Gan, 2014). Besides, the Ministry of Health (2015) defines obesity as a condition, in which the individual has excess body fat. Specifically, obese men and women are those that have excess fat by 25 per cent and 35 per cent, respectively. Furthermore, The Nutrition Month Malaysia Secretariat (2014) refers obesity as the excess weight compared to the ideal weight based individual's height. Therefore, in this study, obesity can be defined as weight with a BMI of 30 kg/m² or over (Gan, 2014; The Nutrition Month Malaysia Secretariat, 2014).

Obesity is considered as a chronic disease that requires prolonged follow-up treatment, therapy and proper attention by the medical practitioner. Obesity contributes to many chronic diseases such as diabetes mellitus, liver and gallbladder (gallstones), dyslipidaemia (high cholesterol), metabolic syndrome, sleep apnea, etc. (Ministry of Health, 2015). In addition, The Nutrition Month Malaysia Secretariat (2014) explains that obesity will have negative effects on internal organs and parts of the human body that will further trigger various diseases such as hormonal, throat, skin problems and so on. According to Prof. Dr. Balan Ratkhakrishanan, obesity also affects the psychological aspect, in which obese individuals tend to have a lack of confidence, that in turn lead to stress, depression and anxiety problems (Utusan Borneo, 2012). What is more critical is that obesity can cause death. It was reported that in 2010 obesity had caused the deaths of 3.4 million people (Ng et al., 2014); while in 2014, obesity caused 2.8 million deaths (Gan, 2014). In addition, obesity also has a negative impacts on the economic growth and prosperity of the country because the government has to allocate a huge amount of money just to cover the medical costs (Lembaga Promosi

Kesihatan Malaysia, 2011). Furthermore, the increase in obesity in the workforce will increase the number of sick leave, which in turn affects productivity.

Various measures have been implemented to address the obesity problem. Teixeira and Budd (2010) explained that the problem of obesity can be overcome by implementing community-based weight management program. According to WHO, obesity can be prevented if people make healthier food choices and engaged in regular physical activity throughout their lives (Aygen, 2012). WHO also suggested a diet that requires individuals to increase the intake of fruits, vegetables, legumes and whole grains, but reduce the intake of salt, sugar and saturated fat. In line with WHO recommendations, the Ministry of Health (2015) proposed the dietary control and physical activities as means of preventing obesity. For those who are obese, 60-90 minutes of moderate physical activity every day can help reduce BMI. In addition, various bodies and institutions have emphasized the importance of nutrition labels as a useful tool for reducing obesity, promoting healthy eating patterns and helping individuals to make informed choices about the food (Hawkes, 2013; Cuk 2009).

NUTRITION LABELS

Nutrition labels refer to a table that lists and describes the nutrient contents and properties on the packaging of processed foods (Tee, 2011; Aygen, 2012; Malaysia Chemicals Department, 2015; & Ministry of Health, 2015). Besides, the nutrition label can be defined as a description used to tell customers about the nutritional properties to help customers to buy nutritious and nutritionally balanced food (Norhidayah & Siti Zaleha 2014). Miller and Cassady (2015) further explain the nutrition label as a label that contains information on calories, serving size and daily quantity or value of some macronutrients, vitamins, minerals, fat, carbohydrates and calcium. According to WHO (2012), nutrition label is a standard format for displaying nutritional information on the packaging of a product that includes levels of energy, protein, total fat, saturated fat, carbohydrates, sugar and sodium, which has become the prerequisite for marketing the processed foods in most countries. Furthermore, Hawkes (2013) defines nutrition labels as a way to provide information to consumers about the nutrients contained in the food. According to Rashidah et al., (2014), the nutrition label is the nutrients contained in a food product that is used by the user to easily understand the nutritional content and can make a comparison between healthy food to eat or otherwise. In short, nutrition label can be defined as the level of nutrients written on food labels, which allows customer to obtain information about the nutrients of food prior to purchase (Aygen, 2012; Malaysia Chemicals Department, 2015).

Drichoutiset et al. (2006) highlighted that nutrition labels are important for three main reasons, namely to provide clear nutritional information, help consumers make informed choice of food and practice healthy eating and avoid confusion about the information contained in the food (Souiden, Abdelaziz & Fauconnier, 2012). According to Kumar and Srivastava (2014), the nutrition label helps educate consumers to make healthier choices. In addition, the Malaysia Chemicals Department (2015) suggests that the nutrition label is important to protect the public from health hazards and negligence in the preparation, sale and use of food. It is also beneficial to the local food industry in developing a profile of their products to consumers, particularly to improve the marketing strategy and increase the chance to trade their products internationally.

NUTRITION LABELS LITERACY

Sorensen et al., (2012) and, Carbone and Gibbs (2013) explained that literacy includes various components such as reading, writing, speaking and listening, numeracy and; culture and practices. In relation to that, WHO (1988) defines health literacy as the degree of achievement of knowledge, skills and self-confidence to take action in changing one's lifestyle and improve personal and society's health. Furthermore, Kickbusch et al. (2005) defines health literacy as the human ability to improve health, seek information and take responsibility (Ormshaw, Hakkari & Kannas, 2013). Besides, health literacy is referred as the involvement of an individual to access, understand, evaluate and associate health information in determining an effective health system (Emma, et al., 2015; Palumbo 2015). Further, the Ad Hoc Committee on Health Literacy (1999) and Nielsen-Bohlman, Panzer & Kindig, (2004) defined health literacy as the ability of an individual to obtain, interpret and use the information on food labels (Eckert et al., 2013; Choi, Rush & Henry, 2013; Cha et al., 2014; Altin et al., 2014; Bailey et al., 2014). In a more detail health literacy is described as the understanding of an individual, that is the extent the individual is capable to read and comprehend printed materials related to health, identify and interpret information presented in graphic formats (charts, graphs, tables) and perform arithmetic operations to make appropriate health care decisions (Pleasant, 2014). Thus, health literacy can be regarded as the ability of an individual to obtain, interpret and use health information. Accordingly, the nutrition label literacy can be referred as the ability of an individual to obtain, interpret and use the information on nutrition labels (Hakkari and Hakkari, 2012; Eckert et al., 2013; Choi, Rush & Henry, 2013; Cha et al., 2014; Altin et al., 2014; Bailey et al., 2014).

Nutrition Label Literacy by Gender

Extant studies highlighted on the significant differences in the use of nutrition labels between genders. In particular, it was revealed that women read nutrition labels more often than men (Singla, 2010; Petrovici, Fearne, Jr. & Drolias, 2010; Zheng, Xu and Wang, 2011) as they are more likely to care for their health (Zheng, Xu and Wang, 2011) and enjoy seeking new information about specific use on food labels (Washi, 2012) as compared to men. Despite much research has suggested that the literacy of the nutrition label is higher for women, there is studies that revealed a contradict results. Specifically, Aygen (2012) found that men use nutrition labels more often than women, while Kumar and Srivastava (2014) and Norazlanshah et al. (2013) showed the insignificant difference between men and women in the use of nutrition labels.

In the Malaysian context, studies showed that more men read nutrition labels than women (Rashidah et al., 2014). The findings are also supported by Cheong, Jasvindar, Lim, Ho and Mohmad (2013), which highlighted that the use of nutrition labels was higher in men than women. Although results were inconsistent across studies, it is reasonable to believe that the nutrition labels literacy will significantly different from men to women. Accordingly, the following hypothesis is proposed for this study:

H₁: There are significant differences in the nutrition label literacy by gender.

Nutrition Label Literacy by Age

Age plays an important role in influencing the reading, understanding and perception of an individual towards nutrition labels (Rashidah et al., 2014). According to Petrovici et al., (2010), individuals who are in the younger age group (18 to 40 years) read nutrition labels

more frequently than those who are in older age groups (more than 60 years). Singla (2010) indicated that individuals aged between 34 and 41 years read nutrition labels more often than those who are between 41 and 48 years. Furthermore, Zheng, Xu and Wang (2011) revealed that individuals in the age range of 30 to 49 years read nutrition labels more often than those aged over 50 years. This finding was also supported by Aygen (2012), which explains that the individuals who are in the age range from 25 to 44 years read the nutrition labels more often than those who are over 40 years old. However, recent findings by Kumar and Srivastava (2014) showed contradict results, in which the findings indicated that there were no significant differences in nutrition label literacy by age. In Malaysia context, Cheong, Jasvinder, Lim, Ho and Mohmad (2013) also revealed contrasting findings that individuals aged 60 years old and above read nutrition labels more frequent than individuals aged below 60 years old. Despite the inconsistent findings of the past studies, it can still put forward that the nutrition label literacy does differ across age groups. Thus, the following hypotheses are proposed to be tested in this study:

H₂: There are significant differences in the nutrition label literacy by age.

Nutrition Label Literacy by Education Level

Singla (2010) showed that reading nutrition labels was also affected by individual education. According to Zheng, Xu and Wang (2011), individuals with higher education level are more likely to read nutrition labels than individuals with low education level. These findings were supported by Washi (2012) and Aygen (2012) indicating that reading nutrition labels are mostly done by individuals with higher education level than those with low education level.

In the Malaysian context, Cheong et al., (2013) found that the tendency of reading nutrition labels was higher among individuals with higher education compared to less educated individuals, due to the lack of disclosure and information relating to the use of nutrition labels in the primary education level. Next, the findings of Rashidah et al., (2014) confirmed previous findings by asserting that individuals with higher education, not only read more often, but also understand the nutrition labels better than those who are less educated. Consequently, it is appropriate for this study to predict the following hypothesis:

H₃: There are significant differences in the nutrition label literacy by level of education.

Nutrition Label Literacy by Income Level

Empirical studies on the difference of reading, understanding and perception of an individual towards nutrition labels by earnings factor showed that the middle-income group read nutrition labels more often than low-income earners or higher (Singla, 2010; Zheng, Xu and Wang 2011; Aygen, 2012). In the Malaysian context, the findings of Cheong et al., (2013) also revealed that the middle-income group read the nutrition label more often than the high and low income earners. Hence, the following hypothesis is proposed to be tested in this study:

H₄: There are significant differences in the nutrition label literacy by income levels.

Nutrition Label Literacy by Ethnicity

In the previous studies, the nutrition label literacy has been found to differ significantly across ethnic. Specifically, Cheong et al., (2013) and Rashidah et al., (2014) showed that the frequency of reading and understanding the nutrition labels was higher among the Malays rather than other ethnics. Accordingly, the following hypothesis is proposed for this study:

H₅: There are significant differences in the nutrition label literacy by ethnic.

METHODOLOGY

This study employed a quantitative and deductive approach. A total of 200 respondents was selected as sample using cluster sampling technique, followed by street-intercept method. The unit of analysis is the individual consumer. The study was conducted in Putrajaya, which recorded the highest household consumption expenditure for the year 2014 (Table 1).

Table 1: Household Consumption Expenditure 2014

Num.	State	Expenses (RM)
1.	Wilayah Persekutuan Putrajaya	5627
2.	Wilayah Persekutuan Kuala Lumpur	5559
3.	Selangor	4646
4.	Melaka	3809
5.	Johor	3808
6.	Pulau Pinang	3505
7.	Wilayah Persekutuan Labuan	3497
8.	Negeri Sembilan	3117
9.	Terengganu	3088
10.	Pahang	2963
11.	Serawak	2826
12.	Kedah	2791
13.	Perak	2760
14.	Kelantan	2578
15.	Perlis	2575
16.	Sabah	2355

Source: Jabatan Perangkaan Malaysia (2015)

This study used a questionnaire as an instrument to obtain data. The items used to measure constructs were adapted from Aygen (2012). This questionnaire is divided into two main parts. Part A consists of questions relating to respondents' personal information such as gender, age, education, income and ethnicity, while Part B measures the literacy of respondents to a label based on three aspects, namely the frequency of reading nutrition labels (16 items), consumer understanding of nutrition labels (3 items) and use of nutrition labels (4 items).

Before conducting the actual study, a pilot study that involved 100 respondents was conducted to examine the respondents' understanding of the questions (Hazz & Maldaon, 2015) and determine the validity of the items and reliability of the instrument (Hair, Anderson, Tatham & Black, 2010). The findings of the Exploratory Factor Analysis (EFA) procedure resulted in the Kaiser-Meyer-Olkin exceeding 0.6 with significant Bartlett's test. The factor structure revealed the three dimensions of the nutrition label literacy, with the total explained variance of 67.50 percent. All items loaded on each factor with a value greater than 0.5 (Hair et al., 2010) in which, these items are a good measure of the factor to be represented, which in turn proves the validity of the item (Pallant, 2015; Bhattacharjee, 2012;

Huck, 2012; Garson, 2013; Gaskin, 2012 & Hair et al., 2010; Zainol, Yasin Omar, & Hashim, 2014). Next, test on the reliability of the scale was conducted using Cronbach's Alpha. The Cronbach's Alpha value for the all the dimensions is higher than the proposed value of 0.7 (Hair et al., 2010). Thus, the reliability of the scale used is satisfactory.

The actual data collection was conducted in November 2015. Given that it is important to protect the interests of the respondents, this study took several steps to ensure ethical behavior practiced in conducting this research. First, the researchers applied the principle of voluntary participation, the respondents were asked to complete a questionnaire on a voluntary basis. They were also informed that they have the right not to participate in the survey (Bhattacharjee, 2012; Saunders, Lewis, & Thornhill, 2009; Now & Bougie, 2009). Second, based on the principle of anonymity and confidentiality, no identification is required in the questionnaires and respondents were assured that all information provided will be considered confidential and maintained with strict solely used for research purposes (Bhattacharjee, 2012; Saunders et al., 2009; Now & Bougie, 2009). Third, respondents provided some information on research, particularly research status and role, as well as research purposes, to get rid of annoyance which may prevent the respondent to participate in the survey (Bhattacharjee, 2012). Data gathered were analyze using descriptive and inferential statistics. Descriptive statistics were used to describe the profile of the respondents, while inferential statistics, i.e. Independent Sample T-Test and Analysis of Variance (ANOVA) were used to test the proposed hypotheses.

RESEARCH FINDINGS

Profile of the Respondents

The majority of the respondents is the female (123, 61.5%) and Malay (115, 57.5%). The average age of respondents is 23.71 years. The majority of respondents are in the younger group, with age 40 years and below (176, 88%). The highest level of education for most of the respondents is a secondary school (136, 68%), while the average income is rm1349.31, where most of them have low-income (138, 69%).

Differences In Nutrition Labels Literacy By Gender, Age And Education

Based on the Independent Sample T-test results in Table 2, the nutrition label literacy is significantly differ across gender [$t_{(df=198)} = -2.294, p < 0.05$], in which the literacy is higher among women than men. Thus, H_1 is supported. The results further showed that the difference nutrition label literacy according to age [$t_{(df=198)} = -0.605, p > 0.05$] and highest education level [$t_{(df=145)} = -0.882, p > 0.05$] is insignificant. Therefore, H_2 and H_3 are not supported.

Table 2: Independent Sample T-test Results

		<i>N</i>	<i>Mean</i>	<i>Std. Deviation</i>	<i>Sig. (2-tailed)</i>
Gender	Men	77	4.5353	0.97461	0.023
	Women	123	4.8735	1.03854	
Age	Younger group	176	4.7270	1.03622	0.546
	Older group	24	4.8623	0.95314	
Education	Lower education	136	4.7020	1.07850	0.379
	Higher education	64	4.8308	0.90362	

Differences In Nutrition Labels Literacy By Level Of Income And Ethnic

Table 3 reveals that the nutrition label literacy differs significantly across ethnic [$F_{3,196} = 5.070, p < 0.05$], but not across income [$F_{2,197} = 0.999, p > 0.05$]. Thus, H_5 is supported, but not H_4 .

Table 3: ANOVA Results

	<i>F Statistics</i>	<i>Sig.</i>
<i>Income</i>	0.999	0.370
<i>Ethnic</i>	5.070	0.002

Overall, only two out of five hypotheses are supported. Specifically, on H_1 and H_5 are supported, which implies that the nutrition label literacy is significantly different by gender and ethnic. A summary of the results of hypothesis testing is shown in Table 4.

Table 4: Summary Results of Hypotheses Testing

Hypothesis	Decision
H_1 : There is a significant difference in the nutrition label literacy by gender.	Supported
H_2 : There is a significant difference in the nutrition label literacy by age.	Not Supported
H_3 : There is a significant difference in the nutrition label literacy by highest education level.	Not Supported
H_4 : There is a significant difference in the nutrition label literacy by income levels.	Not Supported
H_5 : There is a significant difference in the nutrition label literacy by ethnic.	Supported

DISCUSSION

The objective of this study is to investigate the differences in the consumer’ nutrition label literacy across demographic factors (gender, age, education level, income level and ethnicity). The findings show that nutrition label literacy varies significantly across gender and ethnic, but not with other demographic factors tested. Thus, the findings support the findings of previous studies that show that the nutrition labels is are more likely read and used by women than men (Singla, 2010; Petrovici, Fearne, Jr. & Drolia, 2010; Zheng, Xu and Wang, 2011). This situation might be due to the woman’s concern over their health care and their inclination to find new information about specific use on food labels, especially for health products (Zheng, Xu and Wang, 2011; Washi, 2012). Thus, the findings suggest that any attempt to educate and motivate people on the importance and usefulness of nutrition labeling should focus on men than women. The findings also support the previous studies, which highlighted that the use of nutrition labels is higher among Malays than Chinese, Indians and others (Cheong et al., 2013; Rashidah et al., 2014). Therefore, in a campaign to cultivate awareness of the importance of reading nutrition labels, every ethnic Chinese, Indians and other groups should be the target. For example, a brochure about nutrition facts label should be provided in multiple languages and the program should be expanded in order to account for different ethnic groups.

However, the findings was not able to support the findings of previous studies that showed significant differences for the nutrition label literacy by age (Rashidah et al., 2014; Chang et al., 2013). This may be due to the lack of exposure on how to read nutrition labels among the young generation (Azli et. Al., 2013), and difficulty reading too small printed letters on the nutrition label for the elderly (Rashidah et al., 2014). Therefore, in promoting the use of nutrition labels and improve nutrition label literacy, efforts should be aimed at both young and older generations. Besides, the findings also fail to support the findings of previous studies that individuals that highly educated read nutrition labels more often than those who are less educated (Rashidah et al., 2014; Chang et al., 2013). Accordingly, the education program about the use and importance of nutrition labels in an effort to educate consumers to make healthy food choices and at the same time address the problem of obesity should include various levels of education. Moreover, the findings fail to show support for the nutrition label literacy differences by income level (Singla, 2010; Zheng, Xu and Wang, 2011; Aygen, 2012; Chang et al., 2013). Thus, in designing educational programs and promotion of nutrition label literacy, the target group should include all users of the various levels of education.

IMPLICATION

These findings have theory and practical implications. Specifically, this study provides empirical evidence to support previous studies that the nutrition label literacy are significantly different by gender and ethnic. However, this study failed to provide evidence on the nutrition label literacy differences by age, education level and income level. The findings of this work add to the existing knowledge about the nutrition label literacy across demographic factors, particularly in the context of a multicultural society in Malaysia. In addition, this study also contributes to develop further understanding of the use of nutrition labels by consumers in Malaysia, which at this point is too limited in number. Next, the findings also create interest to other researchers to pursue similar studies in different contexts in Malaysia.

Practically, these findings provide useful information to private agencies, governments and stakeholders in planning more effective education programs and promotion on the importance and use of nutrition labels to address the worsening problem of obesity in Malaysia. Specifically, this study reveals the need for programs that focus on men and ethnic minorities. For example, the parties can go to areas where men tend to gather such as mosques, restaurants and other places to distribute and communicate information on the nutrition label. In addition, the parties can revise education programs to cater more specific society such as to the Indians in the estates or to the indigenous people in villages to provide early exposure on the importance and how to read the facts on nutrition labels. The Ministry can also publish books and pamphlets on nutrition labels in multiple languages and distributions can be done during Physical Education or Moral Education classes in schools. In addition, the findings provide useful information regarding the target audience that should be focused as to provide effective nutrition labels modules and education programs. In the context of consumerism, this study reveals that the level of consumer nutrition label literacy in Malaysia is still too low. Indirectly, this finding triggers consumer awareness in order to educate themselves about nutrition labels and to increase the use of nutrition labels as a first step to curb obesity. In addition, consumers in Malaysia should also be more concerned about the rights and responsibilities as wise consumers in selecting and purchasing healthy food.

LIMITATIONS AND FURTHER RESEARCH PROPOSAL

Although this study contributes significantly to the understanding of the nutrition label literacy across demographic factors, this study is limited and constrained by several factors. In order to improve the framework of the study, it is suggested that the limits outlined in this study are addressed in other research in the future. The study involved a sample of 200 respondents, who visited or lived at Dataran Putrajaya Federal Territory. Hence, using a relatively small sample, the findings are limited to only the studied population. To expand and improve generalization of the findings, replication of this study is absolutely necessary, namely by using a larger sample size and focusing much wider areas involving all states in Malaysia. This research only tests the differences in the nutrition label literacy across five demographic factors, namely gender, age, education level, income level and ethnicity. Demographic factors such as religion and the type of occupation are not taken into account. For a better understanding of the differences in the nutrition label literacy among consumers in Malaysia, it is important for future studies to take into account other demographic factors. In addition, in this study, the demographic factors are classified to either two or three classifications. So, it is suggested that in future research, wider classification can be used.

CONCLUSION

This study is conducted to evaluate the differences in the consumer nutrition label literacy across demographic factors. The Independent Sample T-Test and Analysis of Variance (ANOVA) using SPSS were performed on a sample of 200 respondents to test the framework and hypotheses proposed. The findings show that the nutrition label literacy significantly differs across gender and ethnic. The findings contribute in disseminating useful information regarding the nutrition label literacy in an effort to educate consumers on the importance of reading nutrition labels to make healthy food choices that ultimately may alleviate the obesity problem in Malaysia. However, the study is limited to a number of factors and requires replication and improvement in future studies.

With the achievement of the objectives outlined, this study has answered the research questions developed whether there are differences in the consumer nutrition label literacy across demographic factors (gender, age, education level, income level and ethnicity). Accordingly, this study has provided empirical support towards meeting the research gaps related to some issues. First, this study provides empirical evidence that there are differences in nutrition label literacy across demographic factors. Second, this study supports previous studies that there are significant differences in the nutrition label literacy across gender and ethnic.

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