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The Effect of Nutrition Label Literacy and Attitude towards Nutrition Label on Healthy Food Choice among Consumer in Malaysia

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Abstract

This study is conducted to examine the effect of nutrition label literacy and attitude towards nutrition label on healthy food choice. Data were collected from a sample of 420 respondents, aged 15 years old and above, at the Federal Territory of Putrajaya, using self-administered questionnaire. Data were analyzed using multiple linear regression analysis. The findings show that nutrition label literacy and attitude toward nutrition label have a significant influence on the healthy food choice. The effect of attitude toward nutrition label is positive, while the effect of nutrition label literacy is negative. Attitude towards nutrition label appears as a dominant variable to affect healthy food choice. The findings provide useful information and guidance to the relevant parties in designing an effective consumer education programs and promoting a healthy lifestyle among consumers in Malaysia. However, this study is limited by several factors that require a replication and improvement in future studies.

Keywords: Nutrition Label, Nutrition Label Literacy, Attitude towards Nutrition Label, Healthy Food Choice, Obesity.

Introduction

Consumers need to be more discerning about their food intake and must consider the nutrition label as a guide in making healthier food choices (Bosman, Merwe, Ellis, Jerling, & Badham, 2014). However, the usage of nutrition label amongst consumers in Malaysia is very minimal (Norazlan Shah et al., 2013). Hence, consumers make an unhealthy food choice that increase the risk of obesity (The Nutrition Month Malaysia Secretariat, 2014). Obesity is the main threat in most countries and is believed to be the main cause of death with over 2.8 million people annually (Gan, 2014). According to The Nutrition Month Malaysia Secretariat (2014), the rate of obesity in Malaysia has risen from 4.4 percent in 1996 to 15.1 percent in 2011. The rise in

percentage places Malaysia as the number one country di South East Asia, number 6 in Asia and number 17 in the world with the highest obesity rate (Ng et al., 2014). Table 1 shows the rise of obesity in Malaysia according to states from 216.2 percent in 2011 to 238.0 percent in 2015.

TABLE 1: Percentage Rate of Obesity in Malaysia according to States

State	Year 2011 (%)	Year 2015 (%)	Increase (%)
Johor	15.9	18.1	2.2
Kedah	15.2	20.5	5.3
Kelantan	16.2	16.2	0
Melaka	17.7	21.9	4.2
Negeri Sembilan	16.0	23.5	7.5
Pahang	15.3	19.4	4.1
Pulau Pinang	12.8	13.8	1.0
Perak	16.2	17.5	1.3
Perlis	21.7	22.3	0.6
Sabah	10.6	13.4	2.8
Serawak	14.0	18.4	4.4
Selangor	17.1	18.7	1.6
Terengganu	14.0	18.6	4.6
Kuala Lumpur	13.5	14.9	1.4
Putrajaya	-	25.8	-
Jumlah	216.2	238.0	21.8

Source: *Institute for Public Health (IPH) (2011, 2015)*

Due to a serious increase of obesity problems, Ministry of Health Malaysia (KKM) has reviewed the Malaysia Diet Guidelines in 2010 (Ministry of Health Malaysia, 2011) to promote the importance of health. Based on the updated guidelines of MDG, consumers are urged to read the nutrition labels on the food packages before purchasing. This is because consumers who read nutrition labels when purchasing food not only get to purchase high quality foods but maintain better health (Yasin, Ahmad, Nordin, Ghazali, & Abdullah, 2015).

Previous studies have found that the level of nutrition label literacy is high among consumers in developed countries, especially in United Kingdom (UK) (Grunert, Klaus G, Wills, & Fernández-Celemín, 2010). However, the level of nutrition label literacy in developing countries is still low and is a central focus among researchers for studies related to nutrition labels (Ambak et al., 2014; Grunert, Klaus, & Wills, 2007). Although consumers in developing countries are aware of the importance of the nutrition labels, consumers rarely nutrition label literacy, especially when purchasing food (Darkwa, 2014; Kumar, Sushil, & Ali, 2011; Norazlan Shah et al., 2013; Rose, 2012).

Besides, low level of nutrition label literacy is one of the factors that contribute to an increase in health problems related to food consumption (Aygen, 2012). Miller dan Cassady (2015) and; Hawkes, Jewell and Allen (2013), have stated that nutrition labels are one of the important mechanisms in helping consumers making healthy food choice and maintaining good health.

Further, in other studies, the significant roles of nutrition labels in curbing health problems related to food consumption were highlighted.

However, limited studies have been conducted to examine the effect of nutrition label in reducing health problems, particularly in Malaysia. As of now, only the research by Ambak et al. (2014) and Ng et al. (2014) have discussed this issue. Studies on the nutrition label literacy and healthy food choice are hardly found in Malaysia (Norazmir, Norazlanshah, Naqieyah, & Anuar, 2012). Besides, research that discusses the extent to which attitude towards nutrition label influences healthy food choice is limited, which only Ng et al. (2015) and; Shah Alam and Sayuti (2011) have examined the issue in the context of Malaysia.

Therefore, the purpose of this research is to investigate the influence of nutrition label literacy and attitude towards nutrition label on healthy food choice.

Literature Review

Obesity is defined as a change in body weight in an abnormal or overweight condition, with Body Mass Index (BMI) value of 30 kg/m² or more (Gan, 2014). According to The Nutrition Month Malaysia Secretariat (2014), obesity is the body weight that exceeds an ideal weight based on an individual's height. Obesity is also referred as an excess or abnormal accumulation of fats in the adipose tissue which may affect the body health (World Health Organization, 2016). Hence, in this research, obesity is defined as an excess in body weight with BMI of 30 kg/m² and above (Gan, 2014; The Nutrition Month Malaysia Secretariat, 2014; World Health Organization, 2016).

According to Aygen (2012), obesity is the main health problems in most countries. At the global level, the number of obese individuals has increased from 875 million in 1980, to 2.1 billion in 2013 (Ng et al., 2014). In the context of Malaysia, the problems of obesity are distressing (Ambak et al., 2014). National Health and Morbidity Study (NHMS) from 1996 until 2011 has found that the rate of obesity in Malaysia has increased significantly from 4.4 percent in 1996 to 15.1 percent in 2011 (The Nutrition Month Malaysia Secretariat, 2014). Now, Malaysia is labelled as first in South East Asia, sixth in Asia and 17th in the world with the highest obesity rate (Ng et al., 2014).

Realizing of the rapid increase in the obesity rate, various measures are taken to reduce the obesity problems (Ambak et al., 2014). Obesity can be overcome when the individuals make healthy food choice and involve in physical activities (Aygen, 2012; World Health Organization, 2016). Besides, nutrition labels are emphasized as an important mechanism in helping consumers to make healthy food choice (Hawkes et al., 2013; Miller & Cassady, 2015). According to Liu, Hoefkens and Verbeke (2015), nutrition label is the best way to disseminate the information to the consumers regarding the nutrient contents in the food and diet guidelines (Azman & Sahak, 2014).

To date, the level of nutrition label literacy is higher in developed countries (Grunert et al., 2010; Grunert et al., 2007) but low in developing countries including Malaysia (Ambak et al., 2014). Although the consumers are highly aware of the benefits of nutrition labels, they still do not refer to nutrition label while purchasing food products (Darkwa, 2014; Norazlanshah et al., 2013; Rose, 2012). This causes the consumers to have the tendency to make an unhealthy food choice, which brings many health problems including obesity (The Nutrition Month Malaysia Secretariat, 2014). Therefore, it has become the responsibility of consumers to use the nutrition label in order to

help them to make a healthy food choice that can prevent them from various of health problems, especially obesity.

In the context of this study, nutrition label is a listing of the nutrition content and level of the product that is displayed on the food label. Nutrition label literacy is defined as the understanding of the individual by having the tendency to read, understand, identify and interpret the information shown in the graphic format (Graph Chart, Table) on the nutrition label (Rose, 2012). According to Carbone (2013), the nutrition label literacy refers to the numeration which is the required skills to recognize digits and count numbers on the nutrition label. In this study, the nutrition label literacy refers to the ability of a person to obtain, translate, and use the information on the nutrition label.

Cannoosamy, Pugo-Gunsam and Jeewon (2014) defined the attitude towards nutrition labels as a form of one's feeling or impression that affects their food choices. According to Samant, Crandall and Seo (2016), attitude towards nutrition label refers to a form of an individual's tendency to use the nutrition label in making food choices. Hence, the attitude towards nutrition label is defined as individual feelings, perception and evaluation, other positive or negative towards nutrition label in making a healthy food choice

Healthy food choice is the reaction towards an individual's decision by consuming foods that contain protein, fats, carbohydrates and mineral salts in the right portion (Salmon, Fennis, de Ridder, Adriaanse, & De Vet, 2014). Based on Kim, Lee, Gon Kim and Kim (2013) and; Mötteli, Keller, Siegrist, Barbey and Bucher (2016), healthy food choice is the behavior of an individual in consuming vegetables with low fats, less sugar, high fiber, fruits and vegetables. Therefore, healthy food choice is defined as the individual's tendencies to consider, choose and consume a food product with the ratio of protein, vitamins, fats, carbohydrates and minerals.

Theory Framework

The framework is formulated based on the Theory of Reasoned Action (TRA), which developed by Fishbein and Ajzen (1975), the Reactions to Food Model (RFM) by Trendel and Werle (2015) and the existing literature on nutrition label (Knight, 2017; Rose, 2012; Westlake, Sethares, & Davidson, 2013). According to TRA, an individual's intention to execute a certain behaviour (behavioural intention) is influenced by their attitudes towards the behaviour and subjective norms (Ajzen & Fishbein, 1980; Han, Hsu, & Sheu, 2010). Besides, the attitude towards the behaviour also has a direct effect on actual behaviour. Further, the behavioural intention will have a significant effect on the individual actual behaviour. Most of the past studies show that TRA focuses more on the relationship between attitude and actual behaviours (Montano & Kasprzyk, 2015). In TRA, Fishbein and Ajzen (2011) find out that positive attitude will greatly affect someone to get involved in behaviours, whereas negative attitude will reduce the chances of someone of doing that action. The development of RFM is based on TRA, this model focuses on the influence of the attitudes towards the real behaviour, which are the food choices. This model divides the attitude into three components, which are affective, cognitive and evaluative.

Relationship between Constructs

Graham and Laska (2012) and; Barreiro-Hurlé, Gracia and De-Magistris (2010) find out that nutrition label use significantly and positively predicts the healthy food choice among consumer. The results indicate that the higher the usage of nutrition label, the higher the reported healthy

food choice. Besides, Campos et al. (2011) show that nutrition label use may promote healthier eating. Furthermore, Cooke and Papadaki (2014) show that the use of nutrition label has a significant and negative effect towards dietary quality, indicating that nutrition label use might not be sufficient to trigger higher dietary quality among consumer. That is, nutrition label use does not induce the consumer to purchase healthy food product (Sacks, Rayner, & Swinburn, 2009). In addition, they emphasize that the effect of nutrition label use on healthy food choice will remain negative, unless the consumer are well-equipped the nutrition knowledge.

In the context of Malaysia, Norazmir et al. (2012) reveal that the nutrition label literacy is low among young adults and due to that they have less tendency to choose and purchase healthy food. Besides, a study conducted by National Health and Morbidity Survey (2015) report the low level of the nutrition label literacy among Malaysian consumer, which trigger them to choose unhealthy food and consequently lead to bad health results. From the discussions made, it can be clarified that nutrition label literacy has the tendency to influence consumers in making healthy food choice. Hence, the following hypothesis is suggested:

H₁: Nutrition label literacy has a significant influence on healthy food choice.

Previous studies show that consumers attitude is very important in making purchasing decision of food products (Harker, Gunson, & Jaeger, 2003; Magnusson & Hursti, 2002; Schifferstein, 2001). Graham and Laska (2012) also emphasize that the attitude towards preparing healthy food is significant when consuming healthy foods. The findings are supported by Cooke and Papadaki (2014), which reveal that attitude plays a significant role in practising healthy diet and highlight that a positive attitude towards nutrition label induce the consumer to choose healthy food (Cooke & Papadaki, 2014). Similarly, Trendel and Werle (2015) show that attitude does have a significant influence on the consumer's tendency to make healthy food choice.

A study by Ng et al. (2015) in Malaysia indicates that a poor attitude towards nutrition labels are less likely to induce healthy food choice. That is, poor attitude towards nutrition label make the consumer to act irrationally and consequently lead to unhealthy food choice (Ng et al., 2015). Similarly, Shah Alam and Mohamed Sayuti (2011) stress that attitude significantly and positively affects the consumer food purchase intentions. Hence, it can be predicted that the attitude towards nutrition label has the tendency to influence the consumers in choosing healthy foods. It is, therefore, the following hypothesis is suggested:

H₂: The attitude towards nutrition label has a significant influence on healthy food choice.

Based on the literature review, this study suggests that the nutrition label literacy and attitude towards nutrition label have a significant influence on healthy food choice (Diagram 1).

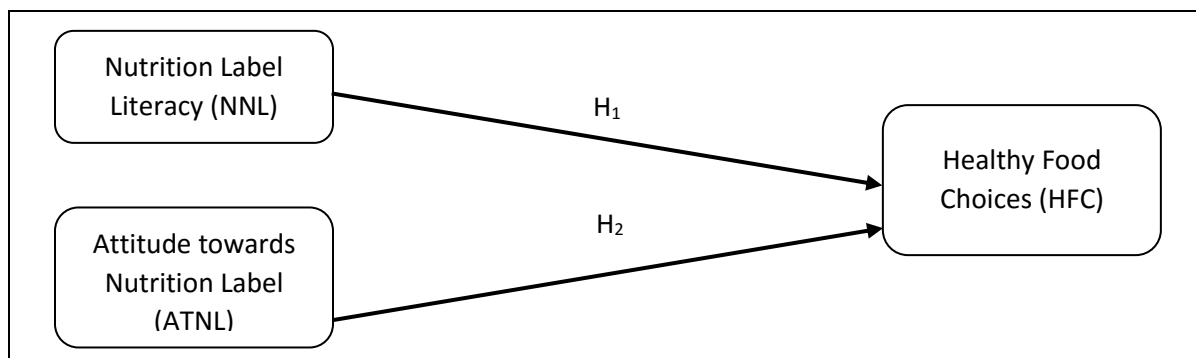


DIAGRAM 1: Propose the framework

Methods

This study adopted a quantitative and deductive approach. The location of the study was in the Federal Territory of Putrajaya because as it has been revealed as the with highest overweight and obese residents (National Health and Morbidity Survey, 2015) and the highest mean of household consumption expenditure in accordance to the household consumption expenditure 2014 released by the Department of Statistics, Malaysia (2015). The sample of the study consisted of 420 respondents selected aged 15 years and above who lived in the Federal Territory of Putrajaya. Sampling technique was created using group sampling techniques and followed by the systematic randomly using the street-intercept method. Data which collected using self-administered questionnaires. All measuring items are according to previous research: nutrition label literacy (Aygen, 2012; Bosman et al., 2014; Godwin, Speller-Henderson, & Thompson, 2006), attitude towards label nutrition labels (Aygen, 2012; Bosman et al., 2014) and healthy food choice (Han, Hsu, & Lee, 2009). The respond in this part is measured using a Likert scale with values between 1 and 7 (1= Very Disagree until 7 = Very Agree).

A back translation method was conducted to translate the question items used in the questionnaire. Pilot study involves two phases, which is a test with 3 experts and 100 potential respondents. An analysis of this study involves two types of statistics, namely the first descriptive statistics including frequency, mean and standard deviation were performed using Statistical Package for Social Sciences (SPSS) software to describe the profile of the respondent, second both inference statistics used to test hypotheses using multiple linear regression analysis techniques. As with other statistical analysis, linear regression analysis also has the assumptions that need to be followed. Linear regression analysis, the key assumptions are normality, outliers and multicollinearity (Coakes & Steed, 2003; Garson, 2012; Hair et al., 2010; Pallant, 2015; Tabachnick & Fidell, 2007).

Research Findings

Respondent Profile, Questionnaires Items and Capability of the Measurement Scale

The sample of this study was 420 respondents aged 15 years and above in the Federal Territory of Putrajaya. The majority of the respondents were women, with 229 (54.5 percent). In terms of age, the average age of the respondents was 30.71 years, with most respondents aged between 25 and 34 years (53.8 percent). Distribution of respondents by the highest level of education

indicated that most respondents had Bachelor's degree in education, which was 241 (57.4 percent).

The validity of items of questionnaire items is conducted using the Exploratory Factor Analysis (EFA) test. The EFA procedure generates Kaiser-Meyer-Olkin values which exceed the value of 0.6 with significant Bartlett's test values. This shows the data is sufficient to carry out factor analysis (Huck, 2012; Zainol, Yasin, Omar, & Hashim, 2014). Hence, the EFA results show three factors with a total value of variance explained by 64.0 percent. The standardized factor loading value reveals that all items are loaded at their respective factors with values above 0.5 (Hair et al., 2010). Therefore, these items are a good measure of the factors represented, which further proves the validity of the item (Bhattacharjee, 2012; Garson, 2013; Gaskin, 2012c; Hair et al., 2010; Pallant, 2015). Based on factor structure (Rotated Component Matrix) nutrition label literacy contains 11 items, attitude towards nutrition label contains 10 items and healthy food choice contains 6 items.

Furthermore, the reliability test on the scale of nutrition label literacy, attitude toward nutrition labels and healthy food selection was carried out using Alpha Cronbach (α) test. Alpha Cronbach (α) value for nutrition label literacy, attitude towards nutrition labels and healthy food choice are 0.918, 0.928 and 0.938, which is higher than the recommended 0.7 (Hair, Black, Babin, & Anderson, 2010). Thus, the scale reliability used is satisfactory.

Findings from the Analysis of Multiple Linear Regressions

As with other statistical analysis, linear regression analysis also has the assumptions that need to be observed, namely normality, outliers and multicollinearity. Skewness and kurtosis values for all items are within ± 2 (Garson, 2012). Thus, the data of this study is normally distributed and the assumption of normality has been fulfilled. Test results on standardized z score values in this study found no value greater than ± 4 . Thus, there is no extreme values in the data (Coakes & Steed, 2003; Hair et al., 2010). Based on observations on the maximum value of Mahalanobis D_2 , there is no extreme values because the maximum value of Mahalanobis D_2 is less than the value of χ^2 [$D_2 = 10.774 < \chi^2 = 13.82$ (df = 2, p1 < 0.001)] (Coakes & Steed, 2003; Hair et al., 2010; Tabachnick & Fidell, 2007). Accordingly, the data of this study can be regarded as independent of extreme values of univariate or multivariate. Thus, the outliers' assumption is fulfilled. The results of the Collinearity Statistics test show that Tolerance values are in 0.996 (nutrition labeling literacy) and 0.996 (attitude towards nutrition labels) greater than the recommended value of 0.2 (Garson, 2012) and VIF values are within 1.004 (nutrition labeling literacy) and 1.004 (attitude towards nutrition labels) is less than the recommended value of 10 (Pallant, 2015). Thus, these results indicate that there is no multicollinearity problem that can affect the findings of the study. The result of various multiple linear regression analysis shown in Table 2, the value of R^2 is 0.385. This means that 38.5 percent of the variations in healthy food choice (dependent variables) can be described by both variables, namely nutrition label literacy and attitude towards nutrition labels. The ANOVA table shows the value of $F(2,417) = 130.487$ with p-value (0.000) less than α (0.001). Thus, at least one of the two independent variables tested attempts to have a significant influence on the dependent variable.

Furthermore, observations on the outputs in the Coefficient Table (Table 3) show that two independent variables tested, i.e. attitude towards nutrition labels and nutrition label literacy have a significant influence on healthy food choice when the value of p (0.000) is less than the

value α (0.001). Standardized beta values showed that attitude towards nutrition labels had a positive influence on the healthy food choice with the value of $\beta = 0.612$ ($p < 0.001$). This shows the more positive attitude towards nutrition labels, the higher the tendency for consumers to healthy food choice. On the other hand, nutrition label literacy has a negative effect on the healthy food choice with the value of $\beta = -0.147$ ($p < 0.001$). This shows the higher the literacy of nutrition labels, the less likely it is for consumers to choose healthy food choice. Comparison of β values further demonstrates that attitudes towards nutrition labels are more dominant than nutrition label literacy. Therefore, H_1 (nutrition label literacy has a significant influence on healthy food choice) and H_2 (attitude toward nutrition label has a significant influence on healthy food choice) are supported.

TABLE 2: Multiple Linear Regression Analysis Results (Model Summary & ANOVA^a)

Model	R	R ²	Adjusted R ²	Std. Error of the Estimate
1	0.620	0.385	0.382	0.75402
	F			sig
	130.487***			0.000

Note:

***significant at $\alpha = 0.001$, **significant at $\alpha = 0.005$, *significant at $\alpha = 0.05$

TABLE 3: Various Linear Regression Analysis Results (Coefficients^a)

Model	Independent Variables	Standardized Beta	t	Sig.
1	Nutrition Label Literacy	-0.147***	-3.816	0.000
	Attitude towards nutrition labels	0.612***	15.900	0.000

Note:

Dependent variables: Healthy food choice

***significant at $\alpha = 0.001$, **significant at $\alpha = 0.005$, *significant at $\alpha = 0.05$

Review of the Hypotheses Testing

Overall, it can be explained that nutrition label literacy and attitude toward nutrition labels have a significant influence on healthy food choice. This indicates that H_1 and H_2 are supported. Summary of hypothesis testing results is shown in Table 4.

TABLE 4: Results of Hypothesis Testing

Hypothesis	Statement of Hypothesis	Result
H_1	Nutrition label literacy has a significant influence on healthy food choice.	Supported
H_2	Attitude toward nutrition label has a significant influence on healthy food choice.	Supported

Discussion and Implication

The findings from the analysis have shown that the nutrition label literacy and attitude towards nutrition label have a significant influence towards healthy food choices. The findings have shown that nutrition label literacy has a negative influence on their healthy food choices. These findings are in line with previous findings by Cooke and Papadaki (2014) whereby a low level of nutrition label literacy has no tendency to support positive healthy food choices. In order to encourage healthy food choices among consumers, the nutrition label literacy needs to be improved by upgrading the label nutrition literacy. By doing so, their attitudes towards the nutrition labels and a positive practice will be encouraged as well. Hence, the government and private bodies can create an education program that focuses on the framework of promoting impactful nutrition label literacy so that the understanding and knowledge of the consumers regarding nutrition labels are always upgraded from time to time. This helps the consumers to practice more positive healthy food choices.

This study has found that the attitude towards nutrition label has a positive influence on healthy food choices. This shows that a more positive attitude towards nutrition label leads to a higher tendency of consumers in making healthy food choices. These findings are consistent with previous research such as Shah Alam and Mohamed Sayuti (2011). This situation is supported by the tendency of consumers who prioritise their health (Cooke & Papadaki, 2014) as well as those who favour reading the nutrition labels when purchasing food (Graham & Laska, 2012). Hence, these findings suggest that the government and private bodies need to educate and encourage consumers on the importance of nutrition label in order to ensure positive attitudes towards nutrition label.

The findings of this study have implications for theory and practice. Theoretically, this study adds to the readily available literature on the role of nutrition labels, especially in Malaysia to encourage consumers to buy wisely, which at this time is still very limited (Norazlanshah et al., 2013). The findings reveal that nutrition label literacy affects the healthy food choice. Practically, these study findings assist the Ministry of Domestic Trade, Co-operatives and Consumerism (MDTCC) and agencies involved such as the Muslim Consumer Association of Malaysia (PPIM) and the Federation of Malaysian Consumer Associations (FOMCA) appropriate strategies to further strengthen the protection of consumer rights, especially in decision-making on nutritional information (Ministry of Domestic Trade Co-Operatives and Consumerism, 2017). In addition, the findings of this study are to provide information to the Ministry of Health Malaysia and relevant agencies such as the Nutrition Month Secretariat of Malaysia to promote health benefits through nutrition label reading to guide consumers in healthy food choice and thereby reducing obesity (Ministry of Health Malaysia, 2016; Tee, 2011b).

The findings of this study will provide guidance to the Ministry of Education to plan and their various nutrition label education programs so that consumers can enhance their existing knowledge (National Health and Morbidity Survey, 2015; Tee, 2011a). In addition, the findings also help non-governmental organizations such as the World Health Organization (WHO) to plan effective programs to help promote the use of nutrition labels to reduce obesity problems (Ministry of Health Malaysia, 2016; World Health Organization, 2016)

Conclusion

Although this study is significantly contributing to the understanding of nutrition label roles to the consumers when making healthy food choices, the findings from the study are limited due to several factors. This study involves sample that consists of 420 respondents aged 15 years old and above within the Federal Territory of Putrajaya. Hence, the generalisation of the findings is only limited to the targeted populations. In order to extend and increase the generalisation of these findings, the replication of this study is necessary. This involves a bigger sample size and requires bigger location study.

This study is limited when it only research on the influence of nutrition label literacy and their attitudes towards nutrition labels in selecting healthy food. There are several factors that contribute a significant influence when it comes to choosing healthy foods such as health knowledge, demography factors and motivation (Barreiro-Hurlé et al., 2010; Cooke & Papadaki, 2014)) Hence, it is suggested that new research should be conducted to study the increasing factors that contribute to the prediction power of healthy food choices and improve the framework of this research.

This research is studying on the influence of nutrition labels literacy on the consumers' choices of healthy food in Malaysia. The findings from the research have shown that the nutrition label literacy and their attitudes towards nutrition labels have a significant influence on the healthy food choices. Hence, this research exposes the importance of nutrition label literacy as a tool that assists consumers in making healthier food choices when purchasing and in turn aids in overcoming obesity problems.

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References

- Ajzen, I., & Fishbein, M. (1980). *Understanding attitudes and predicting social behaviour*. Englewood Cliffs: NJ: Prentice Hall.
- Ambak, R., Naidu, B. M., Omar, M. A., Zaki, N. A. M., Sallehuddin, S. M., & Aris, T. (2014). Food label reading and understanding among obese adults: a population study in Malaysia. *International Journal of Public Health Research*, 4(2), 449-456.
- Aygen, F. G. (2012). Turkish consumers' understanding and use of nutrition labels on packaged food products. *International Journal of Business and Social Science*, 3(6), 171-183.
- Azman, N., & Sahak, S. Z. (2014). Nutritional Label and Consumer Buying Decision: A Preliminary Review. *Procedia - Social and Behavioral Sciences*, 130, 490-498. doi: <http://dx.doi.org/10.1016/j.sbspro.2014.04.057>
- Barreiro-Hurlé, J., Gracia, A., & De-Magistris, T. (2010). Does nutrition information on food products lead to healthier food choices? *Food Policy*, 35(3), 221-229.

- Bhattacharjee, A. (2012). *Social science research: principles, methods, and practices (2nd edition ed)*. Zurich, Switzerland: Creative Commons Attribution.
- Bosman, M. J., Merwe, D. V. D., Ellis, S. M., Jerling, J. C., & Badham, J. (2014). South African adult metropolitan consumers' opinions and use of health information on food labels. *British Food Journal*, 116(1), 30-43.
- Campos, S., Doxey, J., & Hammond, D. (2011). Nutrition labels on pre-packaged foods: a systematic review. *Public health nutrition*, 14(08), 1496-1506. doi: 10.1017/S1368980010003290
- Cannoosamy, K., Pugo-Gunsam, P., & Jeewon, R. (2014). Consumer knowledge and attitudes toward nutritional labels. *Journal of nutrition education and behavior*, 46(5), 334-340.
- Carbone, E. T. (2013). Measuring nutrition literacy: Problems and potential solutions. *Nutritional Disorders & Therapy*, 3(11), 1-2.
- Coakes, S. J., & Steed, L. G. (2003). *SPSS analysis without anguish: version 11.0 for windows*. Queensland: John Wiley & Sons Australia Ltd.
- Cooke, R., & Papadaki, A. (2014). Nutrition label use mediates the positive relationship between nutrition knowledge and attitudes towards healthy eating with dietary quality among university students in the UK. *Appetite*, 83(2014), 297-303. doi: 10.1016/j.appet.2014.08.039
- Darkwa, S. (2014). Knowledge of nutrition facts on food labels and their impact on food choices on consumers in Koforidua, Ghana: a case study. *South African Journal of Clinical Nutrition*, 27(1), 13-17.
- Department of Statistics Malaysia. (2015). *Report On Household Expenditure Survey 2014*. Retrieved from https://www.statistics.gov.my/index.php?r=column/ctwo&menu_id=amVoWU54UTl0a21NWmdhMjFMMWcyZz09.
- Fishbein, M., & Ajzen, I. (1975). *Belief, attitude, intention and behavior: An introduction to theory and research*. New York: Elsevier Science Publishing.
- Fishbein, M., & Ajzen, I. (2011). *Predicting and changing behavior: The reasoned action approach*. New York: Taylor & Francis.
- Gan, R. (2014). Malaysians: Most Obese in South East Asia. Are You One of Them? Find Out Here. <http://www.healthworks.my/author/rachel-gan/>
- Garson, G. D. (2012). *Testing Statistical Assumptions*. Asheboro, NC USA: Statistical Associates Publishing.
- Garson, G. D. (2013). *Validity and Reliability*. Asheboro NC USA: Statistical Associates Publishing.
- Gaskin, J. (2012c). Exploratory factor analysis. *Gaskination's Statwiki*. <https://statwiki.kolobkreations.com>
- Godwin, S., Speller-Henderson, L., & Thompson, C. (2006). Evaluating the nutrition label: its use in and impact on purchasing decisions by consumers. *Journal of Food Distribution Research*, 37(1), 82-86.
- Graham, D. J., & Laska, M. N. (2012). Nutrition label use partially mediates the relationship between attitude toward healthy eating and overall dietary quality among college students. *Journal of the Academy of Nutrition and Dietetics*, 112(3), 414-418.

- Klaus, G., Wills, J. M., & Fernández-Celemín, L. (2010). Nutrition knowledge, and use and understanding of nutrition information on food labels among consumers in the UK. *Appetite*, 55(2), 177-189.
- Grunert, Klaus, G., & Wills, J. M. (2007). A review of European research on consumer response to nutrition information on food labels. *Journal of Public Health*, 15(5), 385-399. doi: 10.1007/s10389-007-0101-9
- Joseph, H. F., William, C., Barry, B. J., Rolph, B. E., Anderson, & Tatham, R. L. (2010). *Multivariate data analysis: A global perspective (7th Eds.)*. New York Person Education Inc.
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2010). *Multivariate Data Analysis: A global perspective (7th edition ed.)*. Upper Saddle River, New Jersey: Pearson Education Inc.
- Han, H., Hsu, L.-T., & Lee, J.-S. (2009). Empirical investigation of the roles of attitudes toward green behaviors, overall image, gender, and age in hotel customers' eco-friendly decision-making process. *International Journal of Hospitality Management*, 28(4), 519-528.
- Han, H., Hsu, L.-T., & Sheu, C. (2010). Application of the Theory of Planned Behavior to green hotel choice: Testing the effect of environmental friendly activities. *Tourism management*, 31(3), 325-334.
- Harker, F. R., Gunson, F. A., & Jaeger, S. R. (2003). The case for fruit quality: an interpretive review of consumer attitudes, and preferences for apples. *Postharvest Biology and Technology*, 28(3), 333-347.
- Hawkes, C., Jewell, J., & Allen, K. (2013). Promoting healthy diets through nutrition education and changes in the food environment: an international review of actions and their effectiveness. *obesity reviews*, 14(2), 159–168. doi: 10.1111/obr.12098
- Huck, S. W. (2012). *Reading statistics and research: 6th edition*. Boston, MA: Person Education, Inc.
- Institute for Public Health (IPH). (2011). National Health and Morbidity Survey 2011 (NHMS 2011) *NonCommunicable Disease* (Vol. 2, pp. 188).
- Institute for Public Health (IPH). (2015). National Health and Morbidity Survey 2015 (NHMS 2015) *Non-Communicable Diseases, Risk Factors & Other Health Problems* (Vol. 2).
- Kim, M.-J., Lee, C.-K., Gon Kim, W., & Kim, J.-M. (2013). Relationships between lifestyle of health and sustainability and healthy food choices for seniors. *International Journal of Contemporary Hospitality Management*, 25(4), 558-576.
- Knight, G. D. (2017). *Health Literacy: An Essential Ingredient for Better Health Outcomes—Overview of Health Literacy Theoretical Concepts*. United States: IGI Global.
- Kumar, Sushil, & Ali, J. (2011). *Assessing Consumer Awareness and Usage of Food Labels and Influences on Food Buying Behavior*. Paper presented at the Prepared for presentation at 21st Annual IFAMA World Forum and Symposium on the Road to.
- Liu, R., Hoefkens, C., & Verbeke, W. (2015). Chinese consumers' understanding and use of a food nutrition label and their determinants. *Food quality and preference*, 41(4), 103-111.
- Magnusson, M. K., & Hursti, U.-K. K. (2002). Consumer attitudes towards genetically modified foods. *Appetite*, 39(1), 9-24.
- Miller, L. M. S., & Cassady, D. L. (2015). The effects of nutrition knowledge on food label use: a review of the literature. *Appetite*, 92(1), 207–216. doi: 10.1016/j.appet.2015.05.029
- Ministry of Domestic Trade Co-Operatives and Consumerism, M. (2017). *Consumer rights*. Retrieved from <http://www.kpdnkk.gov.my/index.php/my/pengguna/hp>.

- Ministry of Health Malaysia. (2011). Guide to nutrition labelling and claims (as at December 2010). from http://fsq.moh.gov.my/v5/images/filepicker_users/5ec35272cb-78/Perundangan/Garispanduan/Pelabelan/GuideNutritionLabel.pdf
- Ministry of Health Malaysia. (2016). *Obesity*. Retrieved from <http://www.myhealth.gov.my/kegemukan>.
- Montano, D. E., & Kasprzyk, D. (2015). *Theory of reasoned action, theory of planned behavior, and the integrated behavioral model*. United State of America: Jossey-Bass public health.
- Mötteli, S., Keller, C., Siegrist, M., Barbey, J., & Bucher, T. (2016). Consumers' practical understanding of healthy food choices: a fake food experiment. *British Journal of Nutrition*, 116(03), 559-566.
- National Health and Morbidity Survey, N. (2015). Alarming trend of overweight and obesity among Malaysia adults. <http://www.iku.gov.my/index.php/research-eng/list-of-research-eng/iku-eng/nhms-eng/nhms-2015>
- Ng, Marie, Fleming, T., Robinson, M., Thomson, B., Graetz, N., . . . Abera, S. F. (2014). Global, regional, and national prevalence of overweight and obesity in children and adults during 1980–2013: a systematic analysis for the Global Burden of Disease Study 2013. *The Lancet*, 384(9945), 766-781. doi: 10.1016/S0140-6736(14)60460-8
- Ng, S. H., Kelly, B. , Se C. H. , Sahathevan S. , Chinna K. , . . . T., K. (2015). Reading the mind of children in response to food advertising: a cross-sectional study of Malaysian schoolchildren's attitudes towards food and beverages advertising on television. *BMC public health*, 15(1), 1047. doi: 10.1186/s12889-015-2392-z
- Norazlanshah, H., Muhammad, I., Hasmira, M. D., Mashita, M., Norfazilah, M. R., & MF, F. N. (2013). The use of nutrition label on food purchasing decision among university students in Kuantan, Malaysia. *Health and the Environment Journal*, 4(1), 1-10.
- Norazmir, M., Norazlanshah, H., Naqieyah, N., & Anuar, M. K. (2012). Understanding and use of food package nutrition label among educated young adults. *Pakistan Journal of Nutrition*, 11(10), 836-842. doi: 10.3923/pjn.2012.934.940.
- Pallant, J. (2015). *SPSS survival manual: a step guide to data analysis using SPSS 6th edition*. Australia: Publish Allen & Unwin.
- Rose, L. D. (2012). Consumers' Use and Understanding of Food Label Information and Effect on their Purchasing Decision in Ghana; A Case Study of Kumasi Metropolis. *Asian Journal of Agriculture and Rural Development*, 2(3), 351-365.
- Sacks, G., Rayner, M., & Swinburn, B. (2009). Impact of front-of-pack 'traffic-light' nutrition labelling on consumer food purchases in the UK. *Health promotion international*, 24(4), 344-352.
- Salmon, S. J., Fennis, B. M., de Ridder, D. T., Adriaanse, M. A., & De Vet, E. (2014). Health on impulse: when low self-control promotes healthy food choices. *Health Psychology*, 33(2), 103–109.
- Samant, S. S., Crandall, P. G., & Seo, H.-S. (2016). The effect of varying educational intervention on consumers' understanding and attitude toward sustainability and process-related labels found on chicken meat products. *Food quality and preference*, 48(3), 146-155. doi: 10.1016/j.foodqual.2015.09.005
- Schifferstein, H. N. (2001). *Effects of product beliefs on product perception and liking*. New York: Springer.

- Alam, S., & Sayuti, M. N. (2011). Applying the Theory of Planned Behavior (TPB) in halal food purchasing. *International Journal of Commerce and Management*, 21(1), 8-20. doi: 10.1108/10569211111111676
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics* (5th edition ed.). Boston, MA: Pearson Education. Inc.
- Tee, E.-S. (2011a). Development and promotion of Malaysian dietary guidelines. *Asia Pacific Journal of Clinical Nutrition*, 20(3), 455-461.
- Tee, E.-S. (2011b). Thumbs up for labels. *The Star*, p. 1. Retrieved from <http://www.thestar.com.my/story/?file=%2F2011%2F6%2F6%2Flifiving%2F8825980>
- The Nutrition Month Malaysia Secretariat, M. (2014). *Eat healthy, be active, prevent obesity* M. D. A. a. t. A. f. t. S. o. Obesity (Ed.)
- Tinjauan Kebangsaan Kesihatan dan Morbiditi, N. (2015). Alarming trend of overweight and obesity among Malaysia adults. <http://www.iku.gov.my/index.php/research-eng/list-of-research-eng/iku-eng/nhms-eng/nhms-2015>
- Trendel, O., & Werle, C. O. (2015). Distinguishing the affective and cognitive bases of implicit attitudes to improve prediction of food choices. *Appetite*, 104(2015), 33-43. doi: 10.1016/j.appet.2015.10.005
- Westlake, C., Sethares, K., & Davidson, P. (2013). How can health literacy influence outcomes in heart failure patients? Mechanisms and interventions. *Current heart failure reports*, 10(3), 232-243.
- World Health Organization. (2012). Population-based approaches to childhood obesity prevention. http://www.who.int/dietphysicalactivity/childhood/WHO_new_childhoodobesity_PREVENTION_27nov_HR_PRINT_OK.pdf
- World Health Organization. (2015). Obesity and overweight. <http://www.who.int/mediacentre/factsheets/fs311/en/>
- World Health Organization. (2016). Obesity and overweight. <http://www.who.int/mediacentre/factsheets/fs311/en/>
- Yasin, N. H., Ahmad, N. A., Nordin, N., Ghazali, M. S., & Abdullah, N. H. (2015). Promosi panduan diet Malaysia 2010: tahap pemahaman komuniti bandar dan luar bandar. *Proceedings of The 4th International Seminar on Entrepreneurship and Business*, 12, 548-558.
- Zainol, Z., Yasin, N. M., Omar, N. A., & Hashim, N. M. H. N. (2014). Determining the Key Factors of Customer-Brand Relationship Investments' Dimensions: Insights from Malaysian Mobile Phone User. *Journal of Relationship Marketing*, 13(4), 1-25. doi: 10.1080/15332667.2014.965649
- Zheng, S., Xu, P., & Wang, Z. (2011). Are nutrition labels useful for the purchase of a familiar food? Evidence from Chinese consumers' purchase of rice. *Frontiers of Business Research in China*, 5(3), 402-421. doi: 10.1007/s11782-011-0137-0