

ASSESSMENT ON KNOWLEDGE, ATTITUDE AND  
PRACTICES OF FOOD AND NUTRITION LABELING  
USAGE AMONG ADULT IN KOTA BHARU, KELANTAN

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## ABSTRAK

Label makanan dan nutrisi mengandungi pelbagai maklumat mengenai makanan dan nutrisi yang boleh didapati di kebanyakan pakej makanan. Label makanan dan nutrisi adalah salah satu alat yang memainkan peranan penting dalam memberi petunjuk kepada pengguna dalam memilih makanan yang sihat. Tujuan kajian ini adalah untuk menilai pengetahuan, sikap dan amalan penggunaan label makanan dan nutrisi di kalangan pengguna dewasa di Kota Bharu, Kelantan. Ciri-ciri sosio-demografi seperti umur, jantina, status perkahwinan, tahap pendidikan, pekerjaan dan indeks jisim badan (BMI) juga telah dinilai untuk menentukan perhubungan antara sosio-demografi dengan penggunaan label makanan dan nutrisi. 164 responden telah didapati dan telah menjawab kajian soal selidik ini. Hampir semua pengguna dewasa (96.3%) yang mengunjungi pasar raya besar, pasar raya dan pasar raya mini untuk membeli bahan makanan cenderung untuk membaca maklumat pada label makanan. Manakala hasil kajian mendapati hanya 54.9% pengguna dewasa membaca label nutrisi. Hasil kajian juga mendapati hanya 59.1% pengguna memahami dengan baik istilah-istilah, peranan dan kepentingan beberapa maklumat nutrisi terhadap gaya pemakanan dan kesihatan mereka. Hanya beberapa maklumat pada label makanan menunjukkan hubungan signifikan dengan ciri-ciri socio-demografi ( $p < 0.05$ ) dan hanya jantina dan pekerjaan mempunyai perbezaan signifikan terhadap kepentingan maklumat nutrisi ( $p < 0.05$ ). Oleh itu, literasi pemakanan dan pengetahuan tentang pemakanan perlu ditingkatkan untuk memastikan pengguna dewasa boleh mengguna dan mentafsir dengan bijak label makanan dan nutrisi yang disediakan dalam memilih makanan yang sihat.

## ABSTRACT

Food and nutrition labeling contain a lot of information about the food and nutrition which are available on most of food packages. Food and nutrition labeling is one of the tools which play the vital roles in guided the consumers in choosing the healthy foods. The purpose of this study was to assess the knowledge, attitudes and practices on usage of food and nutrition labeling among adult consumers in Kota Bharu, Kelantan. Socio-demographic characteristics such as age, gender, marital status, education level, occupation and body mass index (BMI) also had been assessed to determine the relationship with the usage of food and nutrition labeling. 164 participants were conveniently approached and willing to answer the questionnaire of this study. Almost all of the adults consumers (96.3%) of hypermarket, supermarket and minimarket were tend to read food label information. While finding in this study showed that only 54.9% of adult consumers tend to read nutrition labeling. In this study also found 59.1% of adult consumers understand well on the terms, the important and the role of some of nutrition information on their daily practices and to their health. Besides, only a few of food label information showed the significant association with the socio-demographic characteristics ( $p < 0.005$ ) and gender as well as occupation showed the significant different to the mean of important nutrition information ( $p < 0.05$ ). Thus, nutrition literacy and knowledge should be improve in order to ensure adult consumers can use and interpret wisely the food and nutrition information provided in choosing healthy food.



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## LIST OF ABBREVIATIONS

BMI	Body mass index
WHO	World Health Organization
COPD	Chronic obstructive pulmonary
NHMS	National Health and Morbidity Survey
NCD	Non-communicable disease
FDA	Food and Drug Administration
NLEA	Nutrition Labeling and Education Act
USDHHS	US Department of Health and Human Services
NRV	Nutrient Reference Value
TLS	Traffic Light System
NFP	Nutrition Fact Panel

## CHAPTER 1

### INTRODUCTION

#### **1.0 Background of the study**

Food contains a lot of nutrients which are needed by the human body in correct amount to growth, repair and giving energy to the body to make any movement. Human need to choose the correct foods and practices the healthy diet in order to maintain their health. In addition, most of the products available in the market nowadays are high in calorie, fat, refined carbohydrates and sodium (Norazlan Shah *et al.*, 2013) which leads to the rise of non-communicable disease. There is a lot of threatening or non-communicable diseases such as obesity, diabetes and heart disease, which chosen of food is one of the factors that contribute to the formation of the disease. Berning *et al.* (2010) stated that the long-term trend of obesity raises the questions on how it motivates consumers to choose healthier food. This show that choosing the healthy food is very important for health. Consumers should be practicing having healthy diet in order to reduce the risk in getting non-communicable disease.

Food and nutrition labeling can help the consumer to choose the healthy foods. Usage of food and nutrition labeling is one of the ways to get the information about the foods. Food labeling is a major instrument enabling consumers to have information about the kind of the food they purchase and make nutritionally appropriate choices (Basarir & Sherif, 2012). While nutrition labeling is refers to any written, printed or graphic information on food packaging used to inform consumers on the nutritional value of food products (Lobstein & Davies, 2009). Expert



Committee on Nutrition, Health Claims and Advertisement (2010) stated that nutrition label is a listing of the level of nutrient(s) as displayed on the food label. This label provides factual information about the nutritional content of the product (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). Food and nutrition labeling will help the consumer to choose correct foods by giving the detail information about the foods. Besides, consumer also can choose nutrients dense food by referring to the food and nutrition label. Nutrients dense food is the foods that provide the most nutrients for the fewest amounts of calories (Mateljan 2015). Usually, consumers about too curious on what the contents of their foods that they had eaten especially processed foods. To get that information, consumer totally relies on food producers to inform them about the nutritional content of their products by providing food and nutrition label (Shine, O'Reilly & O'Sullivan, 1997).

Consumers will make a purchasing on their groceries` needed by visiting the market surrounding their residence. There is a lot of market nowadays that selling the groceries items at one particular area and each market undergoes on their own classification which are hypermarket, supermarket and mini market based on the service or items they are selling. There are many consumers who will choose that particular types of market for shopping of their goods. Usually, consumers stand from various age groups of human and the most consumers which visiting and purchasing goods is from adults group. Adults group is people who are age from 18 years old and above (Petry, 2002).

In this study the assessment on knowledge, attitudes and practices the usage of food and nutrition labeling among adults was carried out. The usage of food and nutrition labeling among adults was assessing to evaluate the level of their knowledge, attitudes and practices. From this assessment, socio-demographic factors and health status which influences the usage of food and nutrition labeling among adults was also determined. The usage of food and labeling in choosing the food items can influence the consumers to choose the healthy foods and nutrient dense food. The knowledge, attitudes and practices about usage of food and nutrition labeling among adult is important due to make them to practice having healthy diet and reduce the risk of threatening or non-communicable disease.

### **1.1 Problem statement**

Southeast Asia faces an epidemic rise in chronic non-communicable disease such as heart disease, stroke, cancer, and chronic obstructive pulmonary disease (COPD) (Dans *et al.*, 2011). World Health Organization (WHO) (2015) stated that, overall, about 13% of the world's adults population which 11% of men and 15% of women were obese in 2014 and 39% of adults aged 18 years and over (38% of men and 40% of women) were overweight. This shown that adult population is more tends to have overweight and obesity all over the world. Chen (2014) found that the prevalence of overweight and obesity among the Malaysian adults rose to 29.1% and 14.0% respectively as reported in 2006 National Health and Morbidity Survey (NHMS).

A rapid transition of country has generated marked changes in lifestyles, occupational patterns and dietary changes amongst Malaysia (Noor, 2002). People nowadays are tends to practice sedentary lifestyle and taking unhealthy diet as their meals. Sedentary lifestyle and unhealthy diet are the major factors which contribute to the risk of having non-communicable disease. For instance in Malaysia where it has experiencing major dietary shifts toward rising availability of calories from animal products, and from sugar and sweeteners together along with an increased level of sedentary lifestyle practices, that had made significant major public health problems and challenges on the risks of obesity and non-communicable disease (NCD) (Khor, 2012). An increased intake of energy-dense- foods that is high in fat, salts and sugar, accompanied with an increased levels of physical inactivity practices could consequently contribute to the risk of excess weight gain and the NCD in any populations throughout the lifespans, regardless of developed or developing countries (WHO, 2015). Miller and Cassady (2012) stated that researchers are concerned about food label communication and the extent to which food labels can improve diet and prevent chronic disease. Individuals who use labels are more likely to seek nutrition information and to eat healthy food (Miller & Cassady, 2012).

## **1.2 Significance of the study**

The present study was formulated to assess the knowledge, attitudes and practices the usage of food and nutrition labeling among adults. It is important to know whether the consumers use the food and nutrition labeling during choosing the food items or not. From that, the socio-demographic factors and health status that influence the usage of food and nutrition labeling among adult also were determined. Usage of food and nutrition labeling can drive the consumers to choose the healthy food and nutrient dense food. Choosing the healthy food can encourage the



consumers to practice the healthy diet and balanced diet. Healthy diet is very important for human health and by applying healthy diet also can reduce the risk of having non-communicable disease. Besides, this study is one of the platform for consumers to aware and practice about the food and nutrition labeling or information which provided at the cover of the food products. From this consumer especially subjects of this study can evaluate their knowledge, attitudes and practices about the food and nutrition labeling. Consumers will know that food and nutrition labeling is one of the tools that can be used to guide them in choosing healthy food and having healthy diet.

### **1.3 Research questions**

There were several questions to be addressed in the present study namely,

1. Is the knowledge influence the usage of food and nutrition labeling during purchasing the food items?
2. Is the attitudes influence the usage of food and nutrition labeling during purchasing the food items?
3. Is the practices influence the usage of food and nutrition labeling during purchasing the food items?
4. Are the social-demographic characteristics and health status influences the knowledge, attitudes and practices on usage of food and nutrition labeling during purchasing the food items?

## **1.4 Objectives**

### **1.4.1 Main objective**

To assess the knowledge, attitudes and practices the usage food and nutrition labeling among adults in Kota Bharu, Kelantan.

### **1.4.2 Specific objective:**

1. To assess the knowledge on the usage of food and nutrition labeling among adults in Kota Bharu, Kelantan.
2. To assess the attitudes on the usage of food and nutrition labeling among adults in Kota Bharu, Kelantan.
3. To assess the practices on the usage of food and nutrition labeling among adults in Kota Bharu, Kelantan.
4. To determine the relationship between knowledge, attitudes and practices on usage of food and nutrition labeling and socio-demographic characteristics and health status.

## 1.5 Hypotheses and Null Hypotheses

### 1.5.1 Hypothesis 1

#### 1.5.1.1 Null hypothesis ( $H_0$ ):

There is no association between knowledge and usage of food and nutrition labeling.

#### 1.5.1.2 Alternative hypothesis ( $H_1$ ):

There is association between knowledge and usage of food and nutrition labeling.

### 1.5.2 Hypothesis 2

#### 1.5.2.1 Null hypothesis ( $H_0$ ):

There is no association between attitudes and usage of food and nutrition labeling.

#### 1.5.2.2 Alternative hypothesis ( $H_1$ ):

There is association between attitudes and usage of food and nutrition labeling.

### 1.5.3 Hypothesis

#### 1.5.3.1 Null hypothesis ( $H_0$ ):

There is no association between practices and usage of food and nutrition labeling.



#### 1.5.3.2 Alternative hypothesis ( $H_1$ ):

There is association between practices and usage of food and nutrition labeling.

#### 1.5.4 Hypothesis

##### 1.5.4.1 Null hypothesis ( $H_0$ ):

There is no relationship between knowledge, attitudes and practices on usage of food and nutrition labeling with the socio-demographic characteristics and health status.

##### 1.5.4.2 Alternative hypothesis ( $H_1$ ):

There is relationship between knowledge, attitudes and practices on usage of food and nutrition labeling with the socio-demographic characteristics and health status.

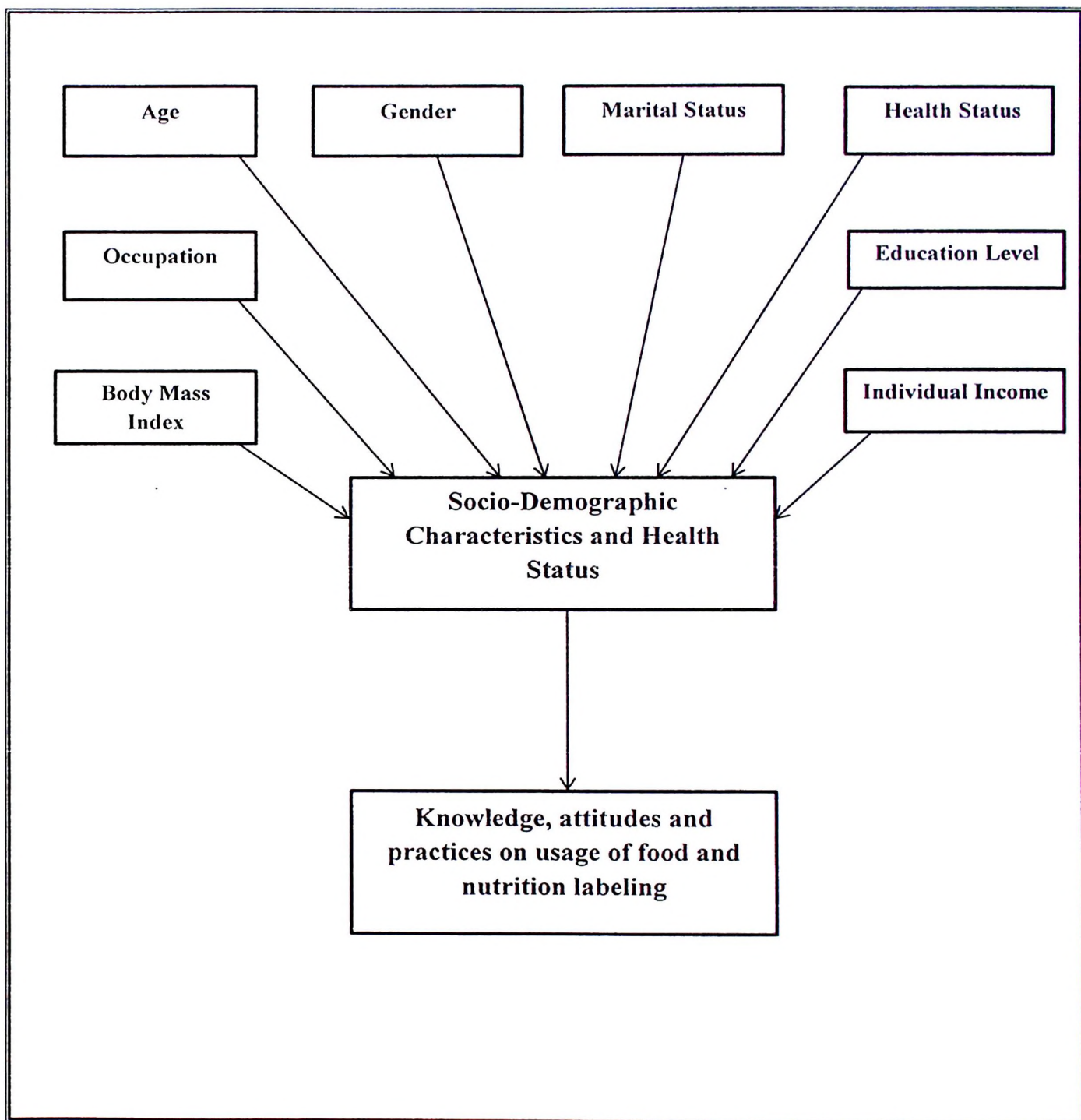


Figure 1: Conceptual framework of the study

## CHAPTER 2

### LITERATURE REVIEW

Food and nutrition labeling is one of the tools that consumers can use to get the nutritional information of the foods. Consumer need some knowledge about the nutrition in order to interpret the nutrition information provided at the cover of the food products. From food and nutrition labeling, consumers can choose the healthy foods and nutrient dense foods. Consumers who are practicing healthy diet are really need the food and nutrition information from the food in order to guide them in choosing the healthy foods. The knowledge, attitudes and practices the usage of food and nutrition labeling among consumers is actually depending on the several factors which will influence them whether to use or not that label.

There are several factors that influence the usages of food and nutrition labeling among the adult consumers. One of the factors is socio-demographic characteristics. The characteristics of the socio-demographic such as age, gender, marital status, occupation or socio-economic status, education level can influence the person in usage of food and nutrition labeling to choose their food items. Secondly is health status which body mass index (BMI) and health status also can influence the person in usage of food and nutrition labeling to choose their food items. An adult group is who are under the age of 18 years old and above (Petry, 2002). There is three classification of the adult group. Young adults is who is under the age of 18-35 years old, middle-aged adults is 36-55 years old and lastly older adults who is older than 55 years old (Petry, 2002).

## **2.1 History of food and nutrition labeling**

Food and nutritional labeling nowadays actually has its own history. Brown (2011) state that the interest in food labeling was began in the 1960s. Consumers began to be concerned about processed foods and started demanding to know exactly what was in the foods they were ingesting (Brown, 2011). Due to this request, the government developed new labeling regulations. According to Brown (2011) it became legal requirement (through the Fair Packaging and labeling Act) to include the following information on the food label:

- The ingredients of packaged (canned, bottled, boxed, and wrapped) foods listed in descending order by weight. Food additives, colors, and chemical preservatives are also required to be listed on the label.
- The name and form (crushed, sliced, whole) of the product.
- The net amount of the food or beverage by weight, measure, or count. In addition to net weight, two other types of weight measurement include weight and solid content.
- The name and address of the manufacturer, packer, or distributor.
- The nutrient content depicted as Nutrition Facts.

To ensure that consumers are informed about a packaged product's ingredients and nutrient content is the responsibility of Food and Drug Administration (FDA) (Brown, 2011). According to Brown (2011) food labeling not always mandatory and it became required for most foods in 1994 when nutrient label on foods changed to Nutrition Fact. Consumers are provided with food label that contain pertinent information in making reasonable food choices (Brown, 2011).



Besides, the Nutrition Labeling and Education Act (NLEA), passed 1990, introduced a standardized food-labeling system. the use of which was mandated on eligible foods starting May 8, 1994 in order to help the consumers understand the nutritional content of their food and its health implications (Harrison & Marske, 2006). According to Harrison & Marske (2006), the purpose of the system is to help consumers construct diets in line with the Dietary Guidelines for Americans presented by the US Department of Health and Human Services (USDHHS). These guidelines include limiting fat, saturated fat, cholesterol, sodium, and sugar, and increasing fiber (Harrison & Marske, 2006). From that implementation consumers can get the nutrition information from food and nutrition labeling until nowadays. Food and nutrition labeling play the important role in choosing the healthy foods.

## **2.2 Regulation on Nutrition Labeling and Claim in Malaysia**

According to Expert Committee on Nutrition, Health Claims and Advertisement (2010) the main objective of nutrition and claims is to describe the nutritional qualities of a food product factually and informatively, besides assisting the consumer in making better food choices when planning their meals. The Regulations on Nutrition Labeling and Claims were drafted by the Expert Committee on Nutrition, Health Claims and advertisement (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). The first Guide to Nutrition Labeling and Claims was published in 2005 (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). Regulation of Nutrition Labeling and Claims in Malaysia is one of the parts in the Guide to Nutrition Labeling and Claims.

In Malaysia, Food Regulation does not require mandatory nutrition labeling for food products, except for special purpose such as infant formula, and foods that have been enriched or fortified (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). There were also no existing laws for health and nutrition claims unless for one regulation that needs the presence of any vitamin, mineral, essential amino acids or essential fatty acids to be supported by a statement that sets out the quantity of these nutrients (Expert Committee on Nutrition, Health Claims and Advertisement, 2010).

The nutrients that must be or mandatory declared on a nutrition label are energy, protein, carbohydrate and fat, besides total sugar should be declared for ready-to-drink beverages (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). Information on energy value is to be expressed as kcal (kilocalories) per 100g or per 100ml of the food or per package if the package contains only single portion (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). Each serving of the food should be given the energy value as quantified on the label (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). Other than kcal, kilojoule (kJ) also can be used as energy value (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). Expert Committee on Nutrition, Health Claims and Advertisement (2010) also stated that the amount of protein, carbohydrate and fat should be expressed as g per 100g or per 100ml of the food or per package if the package contains only single portion and the amount of these nutrients in the food should also be given for each serving of the food as quantified on the label.

In addition, there are optional nutrients that may be displayed on the nutrition label. These include vitamins and minerals, dietary fibre, sodium, cholesterol, fatty acids, amino acids, nucleotide and other food components (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). These nutrients can be displayed on labeling when it meets the various conditions and requirements (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). There are various conditions and requirements for the labeling of these optional nutrients (Expert Committee on Nutrition, Health Claims and Advertisement, 2010).

1. These requirements should be met in order to declare vitamins and minerals on food labels:

- Only vitamins and minerals listed in the Nutrient Reference Value (NRV) can be declared on the food label. Other vitamins and minerals also can be declared on food label if only they have written approval of the Deputy Director General of Health (Public Health), Ministry of Health Malaysia.
- Vitamins and minerals must be present in significant amounts before they can be declared on the food label. This means, the vitamin and mineral content must be at least 5% of NRV per serving.

The labeling format for vitamins and minerals are the same as for the four main nutrients which they should be expressed in metric units per 100g or per 100ml, or per package if the package contains only a single portion (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). This information should also be given per serving as quantified on the label (Expert Committee on Nutrition, Health Claims and Advertisement, 2010).



2. Dietary fibre should be expressed as g per 100g or per 100ml, or per package contains only a single portion to be declared on food label. This information should also be given per serving as quantified on the label.
3. Cholesterol and sodium should be expressed in mg per 100g or 100ml, or prepackage contains only a single portion to be declared on food label. This information should also be given per serving as quantified on the label.
4. A claim is made regarding the amount or type of fatty acids, the amounts of all the four main types of fatty acids, namely saturated, monounsaturated, polyunsaturated and trans fatty acids should be stated and declared clearly on the food label.

According to Expert Committee on Nutrition, Health Claims and Advertisement (2010), the general requirements for nutrition labeling and claims are:

1. All text should be in Bahasa Malaysia, if the food is produced, prepared or packaged in Malaysia. If the food is imported, all text should be in Bahasa Malaysia or English. In either case, translation into other languages may be included.
2. All particulars on nutrition labeling and claims as required by these regulations shall comply with the existing requirements stipulated in Part IV (regulation 9-18) of the Food Regulations 1985.
3. The minimum front size for nutrition labeling shall be not smaller than 4 point lettering unless otherwise stipulated.
4. Small packages with total surface area of less than 100cm<sup>2</sup> and returnable glass bottles are exempted from nutrition labeling, provided that no nutrition claim is made.



Some food products have a nutrition claim. Nutrition claims is any claim made on a label of food product pertaining to its nutritional quality (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). There are four types of permitted nutrition claims. Firstly, nutrient content claim which mean a claim describing the level of the nutrient in a food product (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). Secondly, nutrient comparative claim which is a claim compares the nutrient levels and/or energy value between two or more similar foods (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). Thirdly are nutrient function claim and other function claim. Nutrient function claim is a claim that describes the physiological role of nutrient in growth, development and normal functions of the body, while, other function claim is a claim which provides a positive contribution to health or to the improvement of a function or to modifying or preserving health by other food component (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). Lastly, claim for enrichment, fortification or other words of similar meaning are based on specified in Regulation 26(7) (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). Nutrition claim should be strictly stated as permitted to avoid the misuse of claim. Nutrition claim also can influence the tendency of chooses of food items. Claim, food and nutrition labeling will help consumers to properly choose the food items for them to consume. From that, consumer can choose the healthy food items as meet their desired. All the information about the food can be getting by looking at the food and nutrition labeling.

### **2.3 Implications and benefits of food and nutrition labeling**

Implementation of food and nutrition labeling give a lot of implications and benefits for the consumers. From time to time, consumers heard more and more about the importance of diet and nutrition in maintaining good health and preventing disease. Due to that, the awareness about the food and nutrition labeling keep increasing among consumers and reflected in the changes to their shopping habits (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). Consumers can actively choose healthy products for their quality and nutritional value as their food choices. Accurate nutrition labels and claims will convey the right nutritional information to consumers and allow them to compare the nutritional value of similar products (Expert Committee on Nutrition, Health Claims and Advertisement, 2010). This guided them to making wise choices based on nutritional value of the similar products. Expert Committee on Nutrition, Health Claims and Advertisement (2010) stated that this also reinforces the Ministry's nutrition education activities to encourage consumers to practice nutrition principles when selecting foods and planning for mealtimes.

### **2.4 Improvement on food and nutrition labeling**

Traffic Light Labeling are the most effective model for helping consumers to identify the foods that contribute to healthier diet (Kelly *et al.*, 2009). Balcombe *et al.* (2010) stated that, UK has voluntarily adopted the Traffic Light System (TLS) which indicates the levels of four key nutrients such as fat, sugar, saturates and salts which are found in processed food. A Red light indicates a very high level of a specific nutrient, Amber a medium amount and Green is low amount (Balcombe *et al.*, 2010). The content of each of the nutrients per 100g of any food type that can be converted into per portion quantity is the base of choices of the color (Balcombe *et*



*al.*, 2010). Quantities of these nutrients from any food are measured then compared against the TLS which in turn provides the color coding on the food packaging (Balcombe *et al.* 2010). This system actually wants to help the consumers in getting the balance and healthy products for their diet. Balcombe *et al.* (2010) also stated that this system can be used to monitor the amount of the food being consumed that is high in one or more of the nutrients identified. Magnusson (2010) stated that traffic light labeling enable busy consumers to make healthy choices while doing their shopping. This mean that consumer only need to focus on the color of the food label in making the decision whether that food is healthy or unhealthy rather than go through all the information provided on the food labels.

However, Magnusson (2010) reported that implementation of the traffic light labeling causes the large food manufacturers and retailers may have something to lose from interpretive labeling schemes that call attention to the quality of the nutrition in terms of salts, sugar and fat contents. Sacks, Rayner and Swinburn (2009) stated that the introduction of traffic light labeling by a major retailer on a selection of sandwich and ready-meal lines had no impact on the relative healthiness of consumer purchases in the four weeks after introduction. This system should be given an opportunity with long period of introduction and wiser the usage of traffic light labeling to another food products to assess the effectiveness of that system to the consumers. Magnusson (2010) found that although there is evidence that consumers are interested in nutrition labeling, there is less evidence that consumers use it. This is may be due to that system is something new which introduced to the consumers and consumers are not really exposed to that system. Thus, traffic light labeling should be given a chance to consumers familiar or recognizes well with that

system. Traffic light labeling is one of the easy way to consumers recognize and choosing the healthy foods.

## **2.5 Other factors influence the usage of food and nutrition labeling**

Food and nutrition labeling is a population-based approach to nutrition education that enables consumers to make more healthful choices by providing information at the point of purchase (Besler *et al.*, 2012). Consumers need the nutrition knowledge in order to well understand the information that had been provided at the cover of the food. Having knowledge about the nutrition play the vital role for the consumers to interpret the information had given in making the variety of health and diet decisions. According to Shine, O'Reilly & O'Sullivan (1997) consumer knowledge about nutrition issues increased during the 1980s. Some consumers could understand some of the information of nutrition labeling but there are consumers which still confusing with the information of nutrition labeling provided, especially the use of some technical and numerical information (Cowburn & Stockley, 2005). Most consumers reported that they did understand the terms had been used in nutrition labeling such as 'fat', 'calories/kilocalories', 'sugar', 'vitamin' and 'salt' (Cowburn & Stockley, 2005).

However, Cowburn and Stockley found that consumers least understand the relationship between calories and energy; sodium and salt; sugar and carbohydrate; and the cholesterol and fatty acids. This showed that consumers difficult to understand the meaning of the nutrition terms that had been used in nutrition labeling. Consumers also hard to understand the role of different nutrients that had been mentions in nutrition labeling played in their diet (Cowburn & Stockley, 2005).



Generally, older consumers and people with lower levels of education or income were likely to have the most difficulty understanding the terms used on food labels (Cowburn & Stockley, 2005). Understanding well on terms of that had been used in nutrition label are very helpful in choosing healthy food. Nutrition knowledge is the one that can help the consumers understand well about the information and the role of nutrient in the diet.

Furthermore, health motivation is an internal trait of a person and is consumers' goal-directed arousal to engage in preventive health behaviors including interest in performing health behaviors (Norgaard and Brunso, 2009). Norgaard and Brunso (2009) also stated that use of nutritional information on food labels is perceived as preventive health behavior because it may lead to a choice of healthy food. When consumers aware about the health issues such the adverse effects of disease and risk of disease, they will tend to overcome and reduce the risk of disease. One of the way to overcome that problem is by practicing healthy lifestyle which physically active and having healthy meals. Understand on nutrition information that had been provided on food label is one of the tools that can guide them in choosing healthy foods. Thus, aware about the health issues or having health motivation can make nutritional information on food labels being as promoter to health behavior changes.

Food and nutrition labeling are very important for some population such as patient or those who have certain disease which sometime strictly in choosing the foods. Food and nutrition labeling are very helpful for them in choosing the right foods. Rothman *et al.*(2006) stated that comprehension of food labels can be important for patients, including those with chronic illness

such as hypertension, heart failure, diabetes and obesity to help follow recommendations. Most of those patients usually have their specific dietary that should be followed as it had recommended by the specialist. However, comprehension of current food labels may be difficult for many patients, particularly those with low literacy and numeracy skills (Rothman *et al.*, 2006). Patients with low literacy and numeracy skills will experience difficulty in understand the nutrition information that had been provided at the food packages. This difficulty also influences the food choices which patients may be choose the forbidden or unwanted foods for them. Patients also tend to not follow the dietary recommendations when they do not really understand the nutrition information provided. High literacy on nutrition information are very important especially for patients with chronic illness which strictly in choosing the foods to avoid the risk or adverse effect to the diseases.

Last but not least, health status also plays the important role in influence the consumers to use the food and nutrition labeling. Lewis *et al.* (2009) found that person with chronic diseases checked and used nutritional label information and more aware of national nutritional recommendations than those who are in healthy state. This is because person which having chronic disease more care about their diet and get more exposure about the healthy diet. They need to prevent their disease from becoming worst and make them more careful in selecting the foods. So the food and nutrition labeling are very vital for those who are having chronic disease. For those who are in healthy state, they are less aware about the food and nutrition labeling because they do less worried about the disease. The healthy people who are still concerned about the food and nutrition labeling usually they are aware about the risk of chronic disease. They want to prevent from getting that disease and start to practice having a healthy and balanced diet.

## **CHAPTER 3**

### **METHODOLOGY**

#### **3.0 Overall research design**

The study design of the present study was cross-sectional study. Cross-sectional study is the data either the entire population or a subset thereof is selected and from these individuals, data are collected to help answer research questions of interest (Olsen & George, 2004). In cross-sectional study data are collected in the present time implementation period (Rohani, 2015). Data were collected from the subset of adult population at the Kota Bharu area to answer the questionnaire at that particular time. Quantitative research method was the method that had been used in this study. The study was conducted at the hypermarket, supermarket and minimarket which available at the Kota Bharu area starting from early February 2016 until end of April 2016. Three months was the estimated duration to finish the data collection.

#### **3.1 Study location**

There were a lot of groceries or market at Kota Bharu, Kelantan. All the groceries in Kota Bharu were listed according to their classification as hypermarket, supermarket and minimarket according to their features. The basic principle of hypermarket is means ‘everything under the same roof’ (Perrigot & Cliquet, 2006). Perrigot and Cliquet (2006) also stated that the main characteristics of the hypermarket are large floorspace for the widest assortment of products associated to a large parking lot, a discount price policy linked to networking techniques and self-service techniques based on effective merchandising as well as sales promotion methods. While supermarket is a large self-service food shop (McClelland, 1962)



“A supermarket is a store of not less than 2,000 sq. ft. sales area, with three or more checkouts and operated mainly on self-service, whose range of merchandise comprises all food groups, including fresh meat and fresh fruits and vegetables, plus basic household requisites.” (McClelland, 1962)

Meanwhile, according to ICP Global Office (2011), minimarket is a market with relatively small number of shops in it and it can be convenient for shoppers to have a variety of shops in a small size. From that listed, the groceries from hypermarket, supermarket and minimarket are randomly selected as a location of the study. Selected groceries in this study were Mydin Kubang Kerian, Nirwana, Pacific, Tesco, Nuraini Minimarket, and convenient store such as seven eleventh.

### **3.2 Sample size calculation**

The estimation of population size for consumers for chosen groceries was based on population size of residents at the Kota Bharu. Population size of resident at Kota Bharu was about 314 964 (Kota Bharu Municipal Council Islamic City, 2010). By using Raosoft sample size calculation (Raosoft, 2004) the margin error was set as 5%, confidence interval was 95% and response distribution was 50%. Based on Raosoft calculation, the recommended sample size was 384 participants. However, only 300 participants were decided to be involved in this study.



### **3.3 Sampling design**

The sampling design for this study was convenience sampling. Convenience sampling is made up of people who are easy to reach (Stat Trek, 2015) and is a non-probability sample in which the most convenient (most readily available) cases are chosen for the study (Rohani, 2015). The consumers which easily to be reach and suit with the criteria was needed will be involved in this study. 300 participants of sample will be getting from the groceries by using the convenience sampling.

### **3.4 Inclusion and exclusion criteria**

#### **3.4.1 Inclusion criteria:**

- Adults under aged 18 years old and above
- Consumers which purchasing any food items
- All races

#### **3.4.2 Exclusion criteria:**

- Those aged below than 18 years old
- Those who are not consumers
- Those who are not purchasing any food items