

**FOOD PREFERENCES AND PERCEPTIONS OF
HEALTHY FOOD AMONG PRIMARY SCHOOL
CHILDREN AND BARRIER FACTORS FOR
FOOD SELLING GUIDELINE COMPLIANCE IN
KELANTAN SCHOOL CANTEENS**

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KELANTAN SCHOOL CANTEENS**

by

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LIST OF ABBREVIATIONS

BMI	Body Mass Index
FFQ	Food Frequency Questionnaire
HSCMG	Healthy School Canteen Management Guidelines
IDI	In-depth interview
IQR	Interquartile Range
JKN	Jabatan Kesehatan Negeri
JPN	Jabatan Pendidikan Negeri
MOE	Ministry of Education
MOH	Ministry of Health
NCCFN	National Coordinating Committee on Food and Nutrition
PKD	Pejabat Kesehatan Daerah
PPD	Pejabat Pendidikan Daerah
PPKSS	Panduan Pengurusan Kantin Sekolah Sihat
SES	Socio-Economic Status
WHO	World Health Organization

**MAKANAN KEGEMARAN DAN PERSEPSI TERHADAP MAKANAN
SIHAT DALAM KALANGAN PELAJAR SEKOLAH RENDAH SERTA
FAKTOR HALANGAN KEPADA PEMATUHAN GARIS PANDUAN
PENJUALAN MAKANAN DI KANTIN SEKOLAH KELANTAN**

ABSTRAK

Panduan Pengurusan Kantin Sekolah Sihat (PPKSS, 2011) telah diperkenalkan untuk menggalakkan penjualan makanan sihat di sekolah-sekolah. Walau bagaimanapun, terdapat cabaran untuk melaksanakan menu sihat di kantin-kantin sekolah. Oleh itu, tujuan kajian ini adalah untuk menyelidik perkaitan antara kegemaran dan persepsi terhadap makanan sihat dalam kalangan kanak-kanak sekolah rendah serta faktor-faktor yang menghalang pihak sekolah daripada mematuhi garis panduan penjualan makanan yang terkandung dalam PPKSS 2011. Dalam kajian bahagian I (kajian kuantitatif), ciri-ciri sosiodemografi kanak-kanak, status berat badan, corak pengambilan makanan, serta perkaitan antara kegemaran dan persepsi terhadap makanan diteliti. Persampelan rawak berlapis dijalankan untuk memilih tujuh sekolah. Kajian rentas dengan kaedah tinjauan diberikan kepada 196 kanak-kanak sekolah rendah di Kelantan. Kaedah '*stacking box*' yang diubahsuai digunakan untuk membantu kanak-kanak menentukan kedudukan makanan berdasarkan kegemaran dan persepsi mereka terhadap makanan sihat. Seterusnya, soal selidik kekerapan pengambilan makanan (FFQ) juga digunakan untuk mengkaji corak pengambilan makanan kanak-kanak. Akhirnya, korelasi Spearman digunakan untuk menganalisis korelasi antara pembolehubah terpilih. Manakala dalam kajian bahagian II (kajian kualitatif), persampelan bertujuan digunakan untuk memilih enam guru yang terlibat

dalam pengurusan kantin sekolah. Temu bual semi-struktur secara mendalam dijalankan. Kajian bahagian II menggunakan perisian Atlas.ti 7 untuk tujuan pengurusan data. Keputusan statistik diskriptif menunjukkan ayam bakar sebagai makanan yang sangat digemari oleh responden (62.8%) dan 67.3% menganggap telur rebus sebagai makanan yang paling sihat. Sejumlah 56.6% kanak-kanak menyenaraikan ubi keledak kukus sebagai makanan yang paling kurang digemari, sementara 58.2% menyenaraikan ubi kentang goreng sebagai makanan yang paling tidak sihat. Terdapat korelasi positif signifikan antara kegemaran dan persepsi sihat terhadap kuih pau, kuih apam, mi goreng dan daging burger. Korelasi negatif signifikan dilihat antara BMI dan kegemaran terhadap kuih pau ($r_s = -0.153, P < 0.05$). Sebaliknya, korelasi positif ditemukan antara BMI dan kegemaran terhadap ubi kentang goreng ($r_s = 0.150, P < 0.05$) serta roti goreng sosej ($r_s = 0.151, P < 0.05$). Hasil kajian juga menemui lapan faktor yang menghalang pematuhan kepada garis panduan penjualan makanan termasuklah kurangnya pelaksanaan dan penguatkuasaan, faktor makanan kegemaran kanak-kanak, status sosioekonomi yang rendah, margin keuntungan, kurangnya cara yang berkesan untuk mempromosikan pemakanan sihat, makanan kompetitif yang dijual di luar kawasan sekolah, amalan pemberian makanan oleh ibu bapa dan limitasi dari pihak kantin. Kesimpulannya, kanak-kanak berupaya untuk mengenalpasti makanan sihat dengan betul. Walau bagaimanapun, mereka lebih menggemari makanan proses yang tidak seimbang. Makanan ringan dan juga makanan proses sepatutnya dilarang di kantin sekolah dan bukan hanya dikategorikan sebagai 'tidak digalakkan dijual'. Kajian ini mencadangkan bahawa penguatkuasaan yang tegas, komunikasi yang berkesan serta tindakan perundangan adalah sangat penting untuk memastikan pelaksanaan dan pemantauan garis panduan penjualan makanan dalam PPKSS, 2011 dijalankan secara serius.

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CANTEENS**

ABSTRACT

Healthy School Canteen Management Guidelines (HSCMG, 2011) has been introduced to encourage selling of nutritious food at schools. However, there are challenges to implement healthy menus at school canteens. Thus, the aim of this study was to investigate the association between healthy food preferences and perceptions among primary school children, and also to discover barrier factors that obstruct school canteen from complying the food selling guidelines under the HSCMG 2011. In Part I study (quantitative study), it examined children's sociodemographic characteristics, body weight status, food intake patterns, as well as relationship between food preferences and perceptions. Stratified sampling method was applied to select seven schools. A cross-sectional survey was given to 196 primary school children in Kelantan. The modified stacking box method was used to help children ranked a number of foods according to their preferences and perceptions of healthy foods. Then, Food Frequency Questionnaire (FFQ) was used to investigate children food intake patterns. Lastly, Spearman's Rank-Order Correlation was used to analyse correlation between selected variables. While in Part II study (qualitative study), purposive sampling was applied to recruit six teachers who involved in school canteen management. Semi-structured in-depth interviews were conducted. Part II study used the Atlas.ti 7 for data management. Results from descriptive statistic showed roasted

chicken (62.8%) and boiled egg (67.3%) were ranked by majority respondents as most preferable food and the healthiest food, respectively. A total of 56.6% children had ranked steamed sweet potatoes as the least preferred food while 58.2 % children had ranked French fries as the unhealthiest food. There was positive significant correlation between preferences and perceived healthy for steamed bun, steamed rice cake, fried noodles and fried burger beef patty. A negative significant correlation was observed between BMI and steamed bun preferences ($r_s = -0.153, P < 0.05$). Conversely, BMI was positively associated with preferences for French fries ($r_s = 0.150, P < 0.05$) and fried bread sausage ($r_s = 0.151, P < 0.05$). Research finding also discovered eight barrier factors had discouraged compliance of food selling guidelines included lacking of implementation and enforcement, children's food preferences, low socioeconomic status, profit margin, lacking of effective ways to promote healthy eating, competitive foods sold outside the school, parents' feeding practices and limitations from school caterer. In conclusion, children had the ability to recognise healthy food correctly. However, they still had higher preferences for processed food which is unbalanced diet. Junk food as well as processed food should be banned at school canteen and not just categorized as 'not recommended'. This study suggests that strict enforcement, effective communication and legislative action is very important in order to ensure implementation and monitoring of food selling guidelines under the HSCMG 2011 was carried out seriously.

CHAPTER 1

INTRODUCTION

1.1 Background of the Study

Nutrition is specifically crucial in the childhood years, which is a time of rapid growth and development. Healthy eating pattern provides consistent and good impact on a child's growth and health condition. Healthy eating pattern initiated early in life may not only benefit immediate health but can also influence food preferences later in life. Furthermore, poor eating patterns in childhood have been associated with several health problems in adulthood (Nicklas *et al.*, 2004). It would lead to poor nutrition that leave children susceptible to illness and resulting in school absences (Brown *et al.*, 2008a). Eating a varied, well-balanced diet, with prioritizing on slow-release carbohydrates, lean protein, unsaturated fats and adequate hydration not only provides sustained energy, but concentration and focus (Woods & Dowling, 2014). Research has also established a link between nutrition and behavior. Evidences show that access to nutrition, particularly breakfast, can enhance a student's psychosocial well-being, reduce aggression and school suspensions, and decrease discipline problems (Brown *et al.*, 2008b).

De Onis *et al.* (2010) reported recent obesity prevalence rates by analyzing cross-sectional data from national nutrition surveys of 144 countries. It was found that global childhood overweight and obesity increased from 4.2% in 1990 to 6.7% in 2010 by using the World Health Organization (WHO) Child Growth Standards. In Malaysia,

the National Health & Morbidity Survey 2015 found that the national prevalence of underweight children between the ages of 1 to 18 years old was 13.0%, whereby the prevalence of stunting and thinness was 13.4% and 7.8%, respectively. In addition, the prevalence of obesity was 11.9% (Institute for Public Health, 2015). The prior study, suggested that over the past decade the prevalence of both underweight and overweight among children in Malaysia has been stable or has shown an increasing trend (Khambalia *et al.*, 2012). Currently, obesity trend in school children aged 6–12 years revealed that between the years 2001 and 2008, the prevalence of overweight and obesity had increased from 20.7% to 26.1% using the WHO (2006) criteria (Ismail *et al.*, 2009). Another recent study which is Nutrition Survey of Malaysian Children (SEANUTS Malaysia) conducted in six regions of Malaysia reported 14.4% overweight and 20.1% obesity among urban children aged 7 to 12 years (Poh *et al.*, 2013).

A potential increment in both underweight and overweight among children in Malaysia has significant social, economic, and public health implications. Both forms of malnutrition are linked to a range of adverse health conditions. Underweight children are vulnerable to retardation in physical and mental development, increases susceptibility to infectious diseases, and reduces educational attainment and productivity (Panigrahi & Das, 2014). On the other hand, children who are overweight or obese are at high risk of low self-esteem, poor physical health and emotional well-being (Sahoo *et al.*, 2015) as well as increased rates of psychosocial problems, such as poor quality of life (Zeller *et al.*, 2006). According to Wee *et al.* (2011), Malaysian children aged 9 to 12 years who were overweight or obese had 16.3 times higher risk of developing metabolic syndrome compared to normal weight children. Overweight

and obese children are also at higher risk of developing into obese adults with all its associated non-communicable diseases (Gupta *et al.*, 2012).

Various factors were found to influence eating habits and food choices of children. However, children's food preferences are also known to be one of the important predictors of both present and future food choices (Russell & Worsley, 2007). According to Strachan and Pavie-Latour (2008b), children from six years onwards, start to discriminate and develop understanding of food types that can benefit them. Thus, idea of minimizing exposure to food marketing practices and developing policies to reduce food marketing may not control childhood obesity. Alternately, it may be more effective to promote healthy food choice instead of unhealthy ones to influence children's food preferences and eating behaviors (Harris *et al.*, 2009). Healthy foods were usually associated with protection from diseases. However, knowing all the goods of healthy foods does not mean that children will thus prefer to eat them as there are other factors, such as taste or fun appeals, that come into play. Sometimes, children combined hedonic reasons with rational judgement to describe their food preferences, but this does not cause them to act rationally. The words from them can be opposed to their action. They may comply with their parents or teachers, and they may differentiate between what is healthy or not healthy, but if they are allowed, they may still consume unhealthy food as their level of commitment and knowledge is still not internalized. Thus, all socializing agents such as parents, school teachers and marketers could work on the aesthetic and 'fun and play' features of healthy food to make it more appealing to children and thus help to overcome obesity (Atik & Ozdamar Ertekin, 2013).

Family factors have also been associated with the increase of obesity incidence in children and adolescents (Sahoo *et al.*, 2015). When both parents and the guardians are working full time, they leave limited time for serving healthy food choices for their children. The wide availability of fast-food restaurants offering quick meals which contain high calories but poor in nutrients may lead to unhealthy eating. Moreover, children are influenced to enjoy sedentary lifestyles due to urbanization and modernization. Sedentary lifestyle and lack of physical activity are considered to have an important aspect of obesity (Gillis *et al.*, 2002; Reilly, 2008) because it contributes to imbalance condition between low expenditure of energy and excessive energy intake, thus contribute to caloric imbalance or particularly excessive of calories. When the extra calories were not used by the body, they will be stored as adipose tissue and lead to obesity.

Besides, environmental factors such as school policies also influence children towards practising healthy lifestyle. Schools have the opportunity to continuously and intensively promote healthy behaviours among children (Brady *et al.*, 2003; Rana & Alvaro, 2010). One of the important component of school setting for health promotion is the school canteen. However most of the school canteens do high calories foods which are high in saturated fat, added sugar and added salt instead of nutrient-rich food (Bell & Swinburn, 2004). Therefore, the implementation of healthy school canteen policies has been recommended as an effort to help in preventing unhealthy eating and overweight problems (Wolfenden *et al.*, 2014). Despite the benefits of implementing school nutrition policies and guidelines, international researches suggest that great number of schools fail to implement such initiatives, even when schools are forced to

do so (Ardzejewska *et al.*, 2013; de Silva-Sanigorski *et al.*, 2011; Downs *et al.*, 2012; Gabriel *et al.*, 2009; Keddely, 2007).

In fact, many barriers have been identified to hinder implementation of school nutrition policies and guidelines such as a lack of skill in product classification, a lack of support from parents and the school community, concerns regarding canteen loss of profit, a lack of canteen operators' knowledge and awareness as well as a lack of resources (Ardzejewska *et al.*, 2013; Pettigrew *et al.*, 2009). For canteen operators, they prefer to provide foods that sold well and were easy to prepare. Literature showed that healthier foods would be more expensive since fresh fruits and vegetables are more costly (Newman, 2012). Therefore processed and fast food will definitely become their choices. Moreover, these types of unhealthy products are thought to attract the most sales. Yoong *et al.* (2015) suggested that without active implementation support, schools have difficulties to implement healthy canteen policies as required. Governments have to make sure that sufficient resources and continuous implementation support are given when introducing such policies to schools. Additionally, numerous barriers to implement healthy school canteen guidelines should also be overcome to enable its successfulness within the school setting.

1.2 Problem Statement

Schools provide a good place to implement healthy eating behaviors among students and help to ensure appropriate food intake (O'toole *et al.*, 2007). Children spent at least a third of the day in school and ate at least one meal at the canteen because

most working parents were unable to pack lunches for their children. Moreover, a most common mistake among parents is packing their children off to school without breakfast. Nowadays, most of school children in Malaysia eat at school canteen at least twice a day for three days in a week because they have to attend another religious class in the afternoon after school hours. This has raised public concern about the role of school canteen to provide variety of safe and healthy foods to the school children.

Today, most of school canteens in Malaysia still selling unhealthy food and snacks that can influence the eating habits of children and contribute to the rising of childhood malnutrition in the country. Most food served in school canteens were high in fat and sugar content, contributing to a high calorie intake among students (Murthy & Daniele, 2014). Food sold in school canteens are still far from healthy. The majority of food served in school canteens fall in the category of fried, oily, sweet and processed food as reported in Malaysia online newspaper, New Straits Times on 26th June 2016 (Yesuiah, 2016).

The increasing prevalence of overweight and obesity among children has become a main public health problem in Malaysia. A cross-sectional study was carried out on 175 Malay children from three schools in Kota Bharu district in Kelantan. This study showed that 13.1% of the children were overweight and obese (Wan Abdul Manan *et al.*, 2012). The prevalence of underweight children in this study (27.5%) was twice the prevalence of overweight and obese children in previous study by Wan Abdul Manan *et al.* (2012). While the national prevalence of underweight (weight for age < -2SD) was 13.0% (National Health and Morbidity Survey, 2015). These finding showed that under-nutrition is still a problem among Malay children. Therefore, food

items sold at school canteen should be closely monitored as they would contribute towards childhood malnutrition.

Foods sold at the school canteen should be able to provide refreshment and fulfil energy requirement of children. However, different scenario occur when the street vendors on three-wheelers and small vans outside schools sold a variety of sweets, carbonated beverages and even energized drinks in sachets that are not suitable for children (Rajendra, 2016). Therefore, it is important for the school institutions to ensure that meals served in schools are nutritious. On top of that, food sold in school canteens plays an important role to ensure children have a consistent opportunity to choose healthy food (Cleland *et al.*, 2004). The availability of varieties unhealthy food in canteens caused the children to believe that these food products are appropriate for their daily consumption (Bell & Swinburn, 2005; Hesketh *et al.*, 2005).

In Malaysian setting, Healthy School Canteen Management Guidelines 2011 (HSCMG) has stressed on the approach to serve healthy foods in school canteens (Ministry of Education Malaysia, 2011). However, their messages still ineffective to control the widely sold of high-fat food, food categorized as not recommended for sale, and fast food. One study revealed about food served at school canteens which carbohydrate dominated (75.0%), then followed by high-fat foods (34.4%) and food not recommended for sale (34.4%). Foods high in protein and fast food also represent almost one-third out of total foods served (Rosmawati *et al.*, 2017). On top of that, the Malay Mail Online dated January 17, 2014 had also reported that several primary and secondary schools in the Klang Valley were found to serve food which contained minimal nutritional value and many schools did not adhere to canteen guidelines set

by the Education Ministry. According to one of the Malaysian dietitian in that online newspaper, children were forced to consume such foods due to a lack of healthier choices, resulting in poor eating habits which contributed to the rise of obesity among children. Continuously unhealthy diet habits cultivated from a young age may increase risk for non-communicable diseases later in life (Murthy & Daniele, 2014).

Many school canteens offer food items of low dietary value. It is recommended that these canteens need regular inspection (Mahreen *et al.*, 2010). While Jilcott *et al.* (2007) concluded that one factor leading to effectiveness and compliance to policy adoption and implementation is enforcement. There was study found that all teachers realized the existence of canteen guidelines but they reported a lack of resources for implementation and monitoring (Hayati Adilin *et al.*, 2015). Enforcement strategies by the ministry of education are urgently needed to ensure compliance of canteen operators to the existing guidelines HSCMG 2011, in preparing and selling nutritious food at schools to nurture and sustain good eating habits among children. Hills and Cluster (2011) reported that ongoing monitoring of the strategy is required to ensure sustained improvement in the nutritional quality of food sold in schools. Therefore, qualitative research is recommended to explore barriers to its uptake and identify its implementation by school community as a support system.

Other potential barriers that may affect compliance level towards HSCMG 2011 are regarding the issue of food preferences and perceptions of healthy food. Children's food preferences are repeatedly reported as one of the most important factors of children's food intakes in a naturalistic setting. Domel *et al.* (1996) through their study, examined several psychological, social and demographic factors in relation

to school children's fruit and vegetable intake, found that the children's food preferences were the only significant predictor of intake. Furthermore, children learn their food preferences in the wider social environment through socialization processes (Birch & Fisher, 1998). There are few important learning experiences with foods include exposure, associative conditioning, flavour-flavour learning, parent and peer modelling, exposure to food advertising, parental feeding behaviors and cues about post-ingestive consequences (Gibson & Wardle, 2003; Birch et al., 1990). Therefore, surveying the preferences of population groups allows examination of the distribution of food preferences within the general population and within specific population groups, which may aid in directing public health campaigns such as healthy foods promotions and provide additional insight into the etiology of children's food preferences. Meanwhile understanding young children's thinking about health and illness including perceptions of healthy foods may be particularly important since it is easier to develop positive health attitudes rather than change negative ones later (Jurs et al., 1990). Furthermore, by exploring children's perception of healthy foods can help in the development of management strategies as well as marketing strategies for foodservice at school which refer to canteen in this study.

Unfortunately, surveys assessing the school food environment have been conducted in various jurisdictions but to the best of our knowledge, little is known about the factors that initially enabled or acted as barriers for school community to comply with HSCMG 2011. These barriers may also include the elements of food preferences and perceptions of healthy foods among school children. Therefore it is crucial to investigate the barrier factors in order to encourage schools to comply with the existing guidelines and support healthy eating at school.

1.3 Significance of Study

For those students who frequently buy food from school canteen, the roles of canteen was important to their daily food intake and influence their nutritional status. For other students who are not regularly purchase foods at the school canteen, the canteen still act as an important educational and modeling role for healthy eating habits. A school canteen should provide fairly healthy options for children because it is a place of where children can learn about retail and choice. In many schools, the teaching curriculum integrated nutrition concepts into the teaching and learning process. Skill development appeared compromised when the school food service did not support the nutrition messages taught within the schools (Drummond & Sheppard, 2011). In fact, the food found within the school environment can influence the development of children's eating habits, food preferences and attitudes towards food. Besides preparing nutritious food, the roles of canteen also important to complement knowledge, attitude and practice of the healthy lifestyles that are taught in the classroom.

Current literature shows most of the research on healthy eating promotion among school-age children in Malaysia focused more on the issues such as food safety in school canteen, nutrition education and intervention. This has neglected other important factors that help children in adopting healthful behavior such as children's preferences and perceptions of healthy foods, availability of healthy foods at school and other barriers to the practices of food selling guidelines by HSCMG 2011. Thus, this study tried to explain extensively issue regarding availability of unhealthy foods at school and barrier factors that complicated the compliance of school authorities

towards the guidelines. Therefore, by understanding the issues comprehensively, this study would help to explore more efforts in improving nutritional quality of food and beverages sold at school canteens specifically in Kelantan.

This study also improved the modified 'stacking box' method in studying food preferences and perceptions among Malaysian school-aged children supported by reliability test results. Several studies with different methodology had been performed to assess children's food preferences and perceptions either by traditional approaches or new approaches. Application of modified 'stacking box' method had been highlighted in this study with few modifications in order to adapt with local settings and students. The strength of this method for school-age children had also been discussed in chapter 2 of this thesis. On the other hand, Food Frequency Questionnaire was used to determine children's dietary pattern as well as supporting children's healthy food perceptions and preferences finding.

Additionally, this study had provide new approach of research method in exploring the barrier factors for food selling guidelines compliance especially for local school canteen which is through qualitative method. This may reveal new insights or previously hidden problems and new information that would not be identified through pre-determined survey questions. As this study covered both quantitative results of children's healthy food preferences and perceptions, and also findings from school canteen in charge teachers' in-depth interview, it can provide conceptual understanding and evidence regarding the issue and challenge of healthy food availability at school canteen. Findings from children's healthy food preferences and perceptions make a valuable contribution to the literature, on planning healthy eating

intervention or nutrition education among school-age children for further investigation later.

1.4 Theoretical Framework

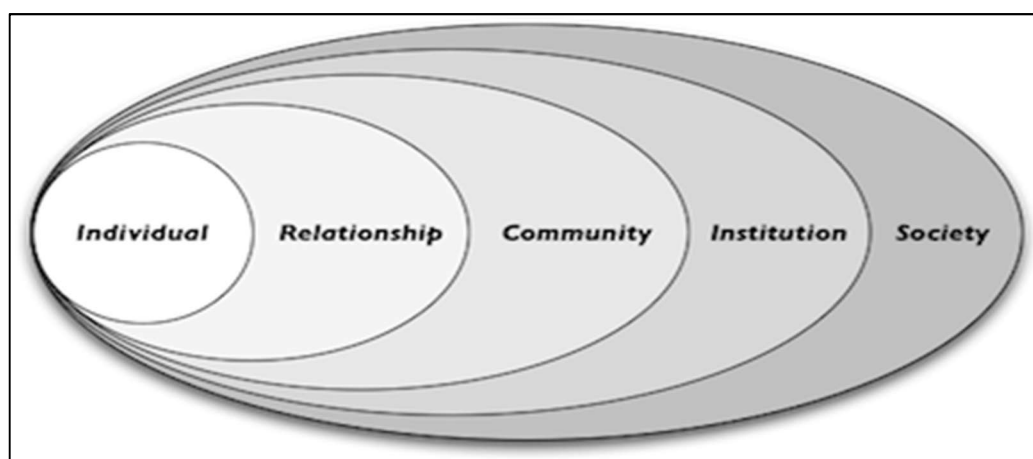


Figure 1.1 Socio-Ecological Model (SEM)

This study had adopted Socio-Ecological Model (SEM) as its theoretical framework which suggests that behavior is affected by, and in turn affects the environment. The model not only focuses on individual level decision making, but also the surrounding environment including interpersonal, organizational, community and public policy which can influence health behaviors (Green & Kreuter, 2005; McLeroy *et al.*, 1988; Sallis *et al.*, 2008). Therefore, some researchers have used SEM to identify barriers to behavioral changes related to health promotion in the communities, especially the low-SES populations. Implementation of food selling guidelines at the school level is frequently considered to involve an organizational transformation process to ensure changes happen at organizational, interpersonal and personal levels

(Fullan & Stiegelbauer, 1991; Green & Kreuter, 2005; Harris & Lambert, 2003). This process also applicable to the implementation of food selling guidelines at school.

According to Green and Kreuter (2005), enabling factors, such as organizational facilitation and resources allocation, become the immediate targets of the processes initiated by organization to achieve behavioral and environmental change. However, the presence of barriers is likely to inhibit action and environmental change. With regard to enabling factors, availability, accessibility and affordability may act as barriers to facilitating health-promoting behavior (Green & Kreuter, 2005), such as healthy eating at school. Different studies have interpreted availability in slightly different ways (Jago *et al.*, 2007). This study adopted the definition of Cullen *et al.* (2003), which states that availability reflects whether preferred foods are present in an environment. Whereas the meaning of accessibility is foods being available in a form, at a location and within a time span that facilitates their consumption. Affordability is related to food prices (Ball *et al.*, 2009; French *et al.*, 2001). The availability of healthy or unhealthy foods in school is likely to influence students' eating patterns (Bere *et al.*, 2005; Bere *et al.*, 2007; French & Stables, 2003; Neumark-Sztainer *et al.*, 2005; Shepherd *et al.*, 2006). It was found that low availability of healthy foods and wide availability of unhealthy foods act as barriers to healthy school meals (Evans *et al.*, 2006; Sandvik *et al.*, 2005; Shepherd *et al.*, 2006).

Furthermore, an unappealing presentation of healthy foods, lack of variety (Evans *et al.*, 2006), unattractive packaging and poor positioning in the canteen are barriers to healthy eating at school and might be seen as relevant to accessibility (i.e. form and location) (French *et al.*, 1997). Previous research has also reported that

affordability (price) is important to healthy eating (French *et al.*, 2001; Glanz *et al.*, 1998; Shepherd *et al.*, 2006).

1.5 Conceptual Framework

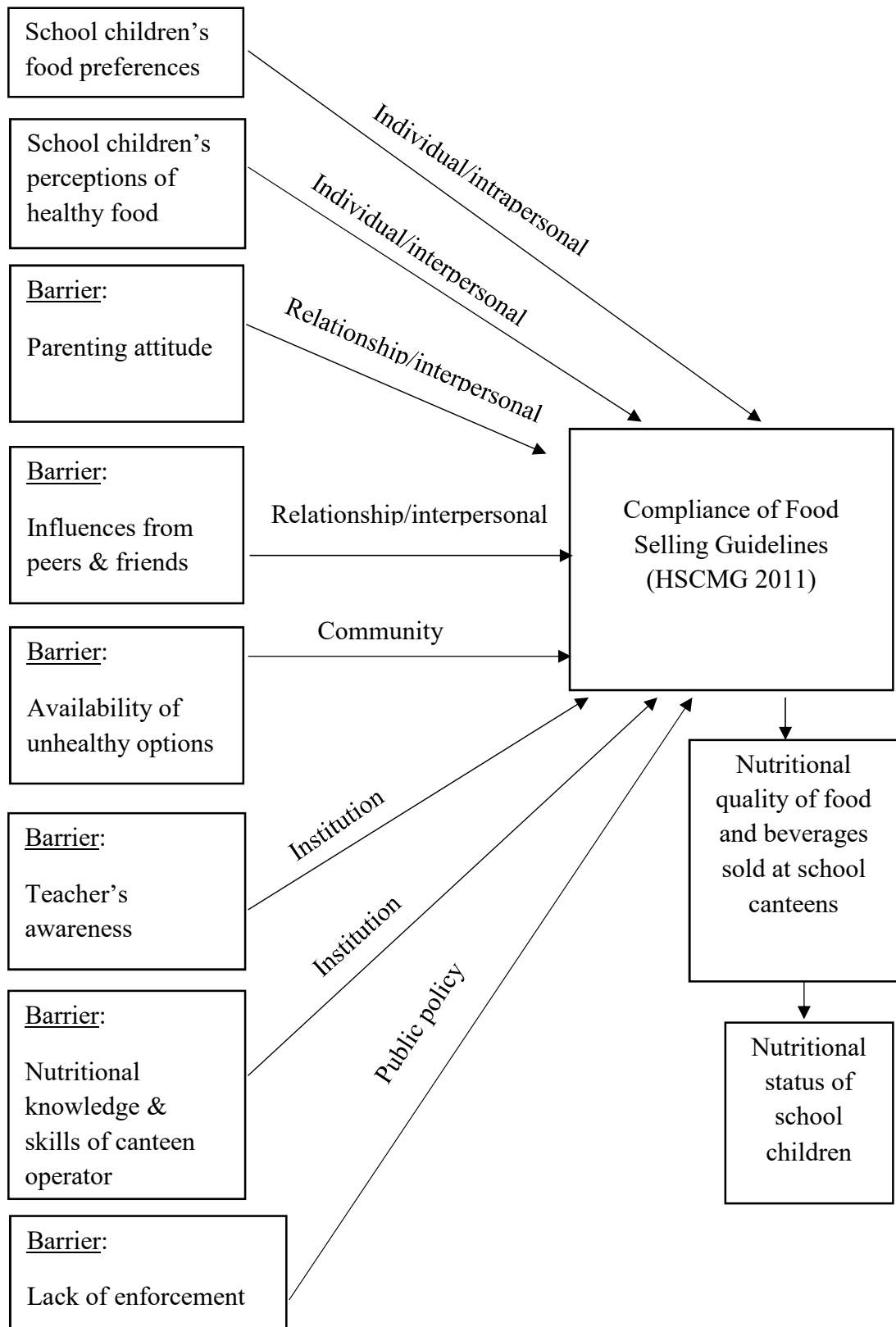


Figure 1.2 Conceptual Framework of Study

The SEM provides a very useful theoretical framework for addressing the numerous and varied obstacles that hinder school canteens from complying with food selling guidelines (HSCMG 2011). The SEM (Elder et al., 2007) suggests that an individual's behavior is integrated in a dynamic network of intrapersonal characteristics, interpersonal processes, institutional factors, community features and public policy. The model assumes that interactions between individuals and their environment are complementary, implying that an individual is influenced by his/her environment and the environment is influenced by the individual. It is also assumed that the environment is comprised of several overlapping levels. The intrapersonal or individual level of the SEM is made up of individual knowledge, attitudes, beliefs and perceptions that influence behavior (McLeroy et al., 1988). Thus, school children's food preferences and perceptions of healthy food fall under the intrapersonal level of the SEM. Both preference and perceptions towards food maybe can influence children's purchasing practice and consequently affect the types of food and beverages available at school canteen. This situation also refer to the compliance level of school regarding the food selling guideline in preparing children's food and beverages.

While parenting attitude and influences from peers and friends comprise important components of the interpersonal/relationship level. Children are more readily influenced by their peers than by adults and are particularly vulnerable to social pressure from their more popular peers as well as slightly older children (Benton, 2004). Thus availability of varieties healthy foods at school canteen as required by the guidelines also depends on this barrier since children's food preferences can also be influenced by their peers and friends. Additionally, Parents are seen to be the most influential and trusted source of information about food (Ji, 2008), as they often impose

their own values regarding consumption on their children and serve as role models (Dresler-Hawke & Veer, 2006). Thus, this factor may also affect the food purchasing practice among children and further the types of foods that available at canteens.

Besides that, feature of the community that may influence the compliance level of food selling guidelines (HSCMG 2011) by school authority include availability of unhealthy options. The access to healthy food is often limited among socio-economically disadvantaged individuals, therefore canteen operators provide more options of unhealthy, cheaper and processed foods which are easier to be prepared in order to avoid loss of profit. Meanwhile, the institutional level of the SEM involves the teacher's awareness regarding the guidelines and nutritional knowledge and skills of canteen operator. Both factors will determined the availability of the foods served at school canteens since school canteen in-charge teachers and canteen operators were accounted to comply with the existed food selling guidelines. They were also part of school canteen committee and school community.

The public policy level of the SEM involves the enforcement and monitoring part. Moreover, the way of the guidelines is carried out by school authorities and all relevant stakeholders who are going to be affected by the guidelines also need to be considered, as well as barriers that can hinder the compliance of the guidelines. Using the SEM as a theoretical framework, this study has been able to address many barriers and challenges that could have influenced compliance of food selling guidelines at school canteens. The conceptual framework of the present study was outlined in Figure 1.2 (page 15). The ability to comply with the guidelines will result in improving nutritional quality of menu at school canteens. However, failure to comply with those

guidelines will affect quality of food sold and consequently influence nutritional status of school children due to the unhealthy food choice.

1.6 Research Questions

This study addresses several research questions as follows:

- a) Do primary school students have the right perceptions about healthy food?
- b) Do primary school students prefer healthy food for their daily food intake?
- c) Do socio-economic factors affect student's food preferences and perceptions?
- d) Which barrier factor may hinder the compliance of food selling guideline at primary schools in Kelantan?

1.7 Research Objectives

1.7.1 General Objective

The general objective of this research was to examine healthy foods perceptions and food preferences among children while exploring barrier factors for food selling guideline compliance in school canteens.

1.7.2 Specific Objectives

Part I: Quantitative Study

1. To measure nutritional status among primary school children.
2. To determine dietary pattern among primary school children.
3. To investigate food preferences and perceptions of healthy foods among primary school children.
4. To determine correlation between food preferences and perceptions of healthy foods among primary school children
5. To determine association between healthy foods preferences with socio-economic factors.
6. To determine correlation between healthy foods preferences and body mass index (BMI) among primary school children.

Part II: Qualitative Study

1. To explore barrier factors for food selling guidelines (HSCMG 2011) compliance in primary schools.

1.8 Research Hypotheses

The research hypotheses for part I are:

- H1: There is significant association between healthy foods preferences and perceptions among school children.
- H2: There is significant association between healthy foods preferences with socio-economic factor.
- H3: There is significant association between healthy foods preferences and BMI among primary school children.

1.9 Definition of Terms

Food Preferences: The way in which people select from among available comestibles on the basis of biological or economic perceptions including taste, value, purity, ease or difficulty of preparation, and the availability of fuel and other preparation tools (Smith, 2006).

Perceptions: Perceptions is a way of understanding or interpreting something (Soanes *et al.*, 2006)

Healthy food: Healthy food can be defined as food and supplements promoted as being beneficial to health, although there is often little or no evidence to support the

claims. They include vegetable food and wholegrain cereals (for which there is evidence of health benefits); food processed without chemical additives; food grown on organic compost; supplements such as bees' royal jelly, lecithin, seaweed, herbs etc.; and various pills and potions (Bender, 2009).

Compliance: The action of obeying an order, rule or request (Soanes *et al.*, 2006)

Guideline: A general rule, principle, or piece of advice ("Oxford Dictionaries," 2016)

CHAPTER 2

LITERATURE REVIEW

2.1 Healthy Eating and Children

Healthy eating can be defined as eating assortments of foods that provide nutrients to human for maintaining of health, feel good, and be energetic. The required nutrients are protein, carbohydrates, fat, water, vitamins, and minerals (Breastcancer.org, 2016). However, different individuals may not have the same definition when they were asked about healthy eating, as it can be viewed in a variety of different ways (Paquette, 2005). It may be seen as the quantity a person consumes, the nutritional content of various food types, following recommendations suggested by national guidelines, restricting intake to a certain number of daily calories, or reducing selected groups of foods (Paquette, 2005; Ronteltap *et al.*, 2012). On top of that, healthy eating can relate to vegetarianism, or adopting a vegetarian diet (Fox & Ward, 2008), as well as consuming fruits and vegetables, eating from all four food groups, and avoiding foods of low nutritional value (Strachan & Brawley, 2009).

Healthy eating practices throughout the life stage assist to prevent many forms of malnutrition and range of non-communicable diseases and conditions. But the increased productions of processed food, rapid urbanization and unhealthy lifestyles have result in modifying of dietary patterns. People are now consuming more foods high in energy, fats, free sugars or salt/sodium, but insufficient of fruit, vegetables and dietary fiber such as whole grains. The exact make-up of a diversified, balanced and healthy eating will vary depending on individual needs (e.g. age, gender, lifestyle,

degree of physical activity), cultural context, locally available foods and dietary customs. But the basic principles that constitute a healthy eating remain the same. (World Health Organization, 2015). Unfortunately, healthy eating has been termed as a ‘costly health behavior’ (Kendzierski & Whitaker, 1997) due to the time and effort needed to accomplish intentions along with having to repetitively engage in the behavior to obtain health benefits. For instance, healthy eating involves shopping for healthy foods, cooking healthy meals, and avoiding fast food and convenience store foods that are low in nutrient value (Kendzierski & Costello, 2004).

Children and adolescents need adequate nutrients to grow and develop normally. They were encouraged to enjoy a wide variety of nutritious foods as recommended by Malaysian Dietary Guidelines for children and adolescents such as eating fruits, vegetables, milk and milk products every day and also adequate amounts of rice, cereals or tubers. The food intake should also include lean meat, fish, poultry, egg, legumes and nuts moderately. Moreover, the intake of saturated fat should be limited and include appropriate amounts as well as types of fats in the diet are seriously encouraged. Children were recommended to choose foods low in sugar and limiting the intake of salt and sauce. Besides, drinking plenty of water daily are also recommended for the children (National Coordinating Committee on Food & Nutrition, 2013).

Childhood eating habits can have an impact on adult health. Children who eat large quantities of energy dense foods, for example, are likely to become overweight and obese, especially if they are sedentary (Booth *et al.*, 2001). In turn, obese children have a higher chance of being obese as adults and suffering from associated disease

conditions such as type 2 diabetes, heart disease and cancer (Gordon-Larsen *et al.*, 2010; Jensen *et al.*, 2014).

It was found that healthy eating habits are developed through socialization, in which families, schools, community, government and international health organizations may all play an active role (Kelly *et al.*, 2006). For very young children, parents are often their main ‘significant others’ who bear the responsibility of modelling healthy eating. For this reason, it is important to focus interventions on parents, most of whom share their children’s less than healthy eating patterns (Campbell & Crawford, 2001; Cutting *et al.*, 1999; Koivisto *et al.*, 1994; National Health & Medical Research Council, 2003). For older preschoolers, primary and secondary school students, peers and teachers were seen to become increasingly important because like most adults, most children tend to adopt their peer behavior. According to Birch (1999), food consumption of toddlers as well as primary and secondary school children is influenced by the social groups to which they belong.

On top of that, schools play an important role in promoting healthy eating and physical activity to students and providing an environment that supports a healthy lifestyle. According to Nutbeam (2000), schools are able to encourage healthy eating by monitoring the nutritional value of foods and beverages sold in the canteen and snack shops available inside school area. Since Exposure to this healthy environment can be extended beyond the school area and influence food choices within the family and community. Additionally, healthy eating promotion continues to play an important role in the prevention of non-communicable disease. Ministry of health Malaysia through its National Strategic Plan For Non-Communicable Disease (2010) has