



UNIVERSITI PUTRA MALAYSIA

***FRUIT AND VEGETABLE CONSUMPTION BEHAVIOUR AMONG
ADULTS
IN SELANGOR, MALAYSIA***

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By

NORSYAHIDAH BINTI ISMAIL

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia, in
Fulfilment of the Requirements for the Degree of Master of Science**

April 2016

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Master of Science

FRUIT AND VEGETABLE CONSUMPTION BEHAVIOUR AMONG ADULTS IN SELANGOR, MALAYSIA

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April 2016

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Faculty : Food Science and Technology

Fruits and vegetables are consumed to keep one stays healthy, happy, and productive. Fruits and vegetables are consumed as these foods have low energy density and are the sources of micronutrient, fibres, and other components of functional properties. There are many benefits of consuming fruits and vegetables. However, in reality, Malaysian adults still lacking of knowledge regarding the benefits of fruits and vegetables. In this case, the main issues identified among adults include knowledge gap and negative perceptions of consuming fruits and vegetables. These problems may affect their health condition and the causes to certain diseases. Over the past few decades, health cases have increased in many developing countries including Malaysia; a country with lack of data about fruits and vegetables consumption. Latest findings in 2007 found that Malaysians are not consuming enough fruits and vegetables in comparison to the level of global recommendation. Therefore, before measuring the amount of fruits and vegetables consumed by adults, recognising the factors influencing the consumption behaviour are crucial.

This research discovers the factors affecting fruits and vegetables consumption such as personal, behavioural, and environmental among adults population in the state of Selangor. These factors must be investigated to increase the fruits and vegetables consumption in Malaysia. The studies in this field are limited in Malaysia and mainly focus on quantitative method. The study aims to narrow down the gap by identifying the factors influencing the fruits and vegetables consumption from the view of behavioural study

This study is designed to meet three proposed objectives namely to investigate the factors influencing fruits and vegetables consumption among adults in Selangor, to examine the consumption behaviour of fruits and vegetables among adults in Selangor, and to understand the barriers of fruits and vegetables consumption among adults in Selangor. This study adopts qualitative approach using focus group discussion and in-depth interview with the Malay, Chinese, and Indian adults. 27 respondents were recruited in three different focus group discussion consisting of Malay, Chinese, and Indian adults. Meanwhile, there were also another 27 different respondents participated in an in-depth interview. The age range of respondents were between 18 to 59 years

old. Data were analysed using constant comparative method. The research findings identified that the personal factors were discourage by taste, effect of personal appetite, knowledge, routine and continued good eating habits, self-health condition, and personal beliefs. Meanwhile, the behavioural factors include age, marital status, and beliefs which were closely related to the consumption of fruits and vegetables. For environmental factors, social influence and the physical conditions of fruits and vegetables were discovered. Sub-themes found include several tips or which the Malay communities refer them as '*petua*' from old folks and friends, as well as the availability, season, quality, price, and the convenience of fruits and vegetables. Other than that, the findings include the present practice of consumption pattern, the influence of beliefs of fruits and vegetables among adults, as well as using fruits and vegetables in cooking. Next, existence barriers to consume fruits and vegetables were identified namely personal perception known as discourage to consume by taste, health issues and limitations, and time constrain in preparing fruits and vegetables. It was also identified that it has become a challenge for national fruits and vegetables marketers to sustain the foods' availability, quality including freshness, convenience, technology, price, and honesty.

Finally, this study calls for an improvement for national health authorities in Malaysia to bridge the knowledge gap among adults in Selangor, Malaysia. In conclusion, this research provides a crucial information to the health authorities, fruits and vegetables marketers, as well as contribute to the body of knowledge.

Keywords: *consumption behaviour, fruits, vegetables, adults.*

Abstrak thesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Master Sains

TABIAT PENGAMBILAN BUAH-BUAHAN DAN SAYUR-SAYURAN DI KALANGAN ORANG DEWASA DI SELANGOR, MALAYSIA

Oleh

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Buah-buahan dan sayur-sayuran di makan bagi memastikan seseorang itu sihat, gembira dan produktif. Buah-buahan yang di makan ini mempunyai kadar ketumpatan tenaga yang rendah serta sumber kepada mikronutrien, fiber, dan juga pelbagai kegunaan komponen lain. Terdapat banyak faedah yang boleh didapati dari buah-buahan dan sayur-sayuran. Walau bagaimanapun, secara realitinya, golongan dewasa di Malaysia masih lagi kekurangan pengetahuan berkaitan khasiat buah-buahan dan sayur-sayuran. Dalam kajian ini, isu utama yang dikenalpasti berlaku di kalangan orang dewasa termasuklah kekangan dari sudut pengetahuan dan perspektif negatif tentang pengambilan buah-buahan dan sayur-sayuran. Masalah ini memberi kesan kepada tahap kesihatan tubuh badan mereka serta menyebabkan berlaku proses menghadapi sesuatu penyakit. Sejak beberapa dekad terdahulu, kes kesihatan telah meningkat di negara membangun, termasuklah Malaysia; negara yang kekurangan data mengenai buah-buahan dan sayur-sayuran. Penemuan keputusan terkini pada tahun 2007 menunjukkan rakyat Malaysia tidak mengambil jumlah buah-buahan dan sayur-sayuran yang disarankan, jika dibuat perbezaan dengan saranan peringkat global. Oleh itu, sebelum mengira jumlah buah-buahan dan sayur-sayuran yang dimakan oleh golongan dewasa, penting bagi kita mengetahui faktor yang menyebabkan pengambilan buah-buahan dan sayur-sayuran seperti faktor personal, faktor perilaku serta faktor persekitaran di kalangan orang dewasa di dalam negeri Selangor. Faktor-faktor ini perlulah di kaji bagi meningkatkan pengambilan buah-buahan dan sayur-sayuran di Malaysia. Kajian di dalam bidang ini adalah terhad di Malaysia dan kebanyakan kajian hanya bertumpu kepada cara kuantitatif. Oleh itu, kajian ini diperlukan bagi mengisi maklumat dengan mengenalpasti faktor-faktor yang mempengaruhi pengambilan buah-buahan dan sayur-sayuran dari sudut pandangan kajian perilaku. Kajian ini di rangka bagi memenuhi objektif seperti menyiasat faktor-faktor yang mempengaruhi tabiat pengambilan buah-buahan dan sayur-sayuran di Selangor, memeriksa tabiat pemakanan buah-buahan dan sayur-sayuran di kalangan orang dewasa di Selangor, dan memahami halangan-halangan dalam meneruskan pengambilan buah-buahan dan sayur-sayuran di kalangan orang dewasa di Selangor. Kajian ini menggunakan kaedah kualitatif menggunakan kaedah temubual berkumpulan dan temubual secara mendalam dengan libatan orang dewasa dikalangan kaum Melayu, Cina dan India. 27 orang responden terlibat di dalam tiga temubual

kumpulan secara berasingan dan 27 orang responden berbeza dipilih menjadi responden dalam temubual secara mendalam. Usia respondent yang dipilih untuk ditemubual adalah dalam lingkungan 18 hingga 59 tahun. Data dianalisis dengan menggunakan kaedah 'constant comparative'. Hasil kajian yang dikenalpasti dari faktor personal adalah pengalaman dari segi rasa, atitut personal, pengetahuan, rutin serta tabiat pemakanan yang baik secara berterusan, faktor kesihatan diri, dan kepercayaan dalam budaya dan agama. Sementara itu, faktor perilaku pula adalah umur, etnik serta status perkahwinan adalah berkait rapat dalam pengambilan buah-buahan dan sayur-sayuran. Faktor persekitaran yang dikenalpasti pula melibatkan hubungan sosial serta faktor fizikal buah-buahan dan sayur-sayuran. Sub-tema yang dikenalpasti termasuklah beberapa panduan tips atau di kalangan komuniti Melayu yang dikenali sebagai 'petua' daripada orang yang lebih tua dan kawan-kawan, ditambah dengan faktor kebolehdapatan, musim, kualiti, harga serta mudah disediakan. Selain daripada itu, hasil dapatan kajian menunjukkan amalan harian dalam pengambilan buah-buahan dan sayur-sayuran, kesan kepercayaan buah-buahan dan sayur-sayuran dalam makanan di kalangan golongan dewasa, serta aplikasi penggunaan buah-buahan dan sayur-sayuran di dalam masakan harian mereka. Kemudian, halangan-halangan untuk meneruskan pengambilan buah-buahan dan sayur-sayuran di namakan persepsi personal iaitu halangan rasa, isu kesihatan dan halangannya, dan faktor kekurangan. Selain itu, turut dikesan adalah cabaran yang perlu ditangani oleh pihak pemasaran negara untuk memastikan kebolehdapatan makanan, kualiti termasuklah kesegaran, kemudahan, teknologi, harga serta ketelusan penjual. Akhir sekali, kajian ini meningkatkan kesedaran untuk penambahbaikan oleh Kementerian Kesihatan Malaysia untuk menambah pengetahuan golongan dewasa di Selangor, Malaysia. Kesimpulannya, kajian ini memberikan informasi yang penting kepada Kementerian Kesihatan Malaysia, pemasar buah-buahan dan sayura-sayuran dan juga menyumbang kepada pengetahuan berguna untuk rakyat Malaysia.

Kata Kunci: *tabiat pemakanan, buah-buahan, sayur-sayuran, orang dewasa.*

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I certify that a Thesis Examination Committee has met on 07 April 2016 to conduct the final examination of Norsyahidah binti Ismail on her thesis entitled "Fruit and Vegetable Consumption Behaviour among Adults in Selangor, Malaysia" in accordance with the Universities and University Colleges Act 1971 and the Constitution of the Universiti Putra Malaysia [P.U.(A) 106] 15 March 1998. The Committee recommends that the student be awarded the Master of Science.

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LIST OF ABBREVIATIONS

SCT	Social Cognitive Theory
FAMA	Federal Agricultural and Marketing Authority
FAO	Food and Agriculture Organization of the united nations
WHO	World Health Organization
MANS	Malaysia Adults Nutrition Survey
RM	Ringgit Malaysia
FGD	Focus Group Discussion



CHAPTER ONE

INTRODUCTION

1.1 Introduction

This chapter discusses the introduction to the study of behavioural studies on the current consumption of fruits and vegetables in Malaysia. Briefly, this chapter comprises seven sub-topics, begins with the background of the study which focused on the topic of the research, followed by review of the problem statement, research objectives, scope of the study, significance of the study, summary of chapters, and finally completed with the anticipated findings.

1.2 Background of the Study

Malaysia is considered as one of the most developed among the developing countries and it is classified as an upper-middle income country (PricewaterCoopers, 2005). Malaysians are spotted to experience changes in their lifestyles due to the increase in demand for healthy and convenience foods such as processed fresh foods, organic foods, as well as fruits and vegetables. Additionally, according to Sian, Chuan, Kai, and Chen (2010), Malaysia's consumer lifestyles is changing and evolving due to the rising prosperity and educational level. Convenience foods in various forms such as pre-cooked, chilled, and frozen are mainly suitable for busy individuals in contemporary lifestyles. A report by PricewaterCoopers in 2005 found that Malaysian consumers spend a high percentage of their income on food, groceries, and personal items.

This was ranked third out of ten major economies in Asia-Pacific region, with an average of RM505 per month. It was also reported that half of the amount were spent on groceries like meat, fruits, and vegetables. Fruits and vegetables are good for health (Slavin and Lloyd, 2012) since they contain vitamins, minerals, protein, fibres, natural substance, as well as low in fat, sodium, and calories in comparison to other types of food which help the body to stay healthy (Devine, Connors, Bisogni, and Sobal, 1998). Previous studies constantly identify a decrease of many cancers such as colon, breasts, and lungs (Verhoeven, Goldbohm, Poppel, and Verhagen, 1996; Ziegler, 1989), as well as cardiovascular diseases, diabetes, stroke, obesity (Szczepanska, Scholz, Liszewska, and Luszczynska, 2013), and alimentary tract (Naska *et al.*, 2000) with a significant consumption of fruits and vegetables.

Based on the data from Ministry of Health Malaysia in 2010, a high mortality rate in Malaysia was caused by an ischaemic heart disease. Thus, the idea of increasing fruits and vegetables consumption could help to reduce the costs of medical care of those diseases. Consequently, the fruits and vegetables consumption is known to reduce the problems of obesity and overweight (Epstein *et al.*, 2012; Pomerleau, Lock, and McKee, 2005). There are also the chances of reducing 31 percent of ischemic heart disease, 20 percent of oesophageal cancer, 19 percent of ischemic stroke, 19 percent of

gastric cancer, and 12 percent of lung cancer if individuals consume an adequate amount of fruits and vegetables.

Table 1: Food Self-efficiency in Malaysia (percent) from 1995 to 2010

Food/Year	1995 (unit)	2000 (unit)	2005 (unit)	2010a (unit)
Rice	76	70	72	90
Fruits	89	94	117	138
Vegetables	72	95	74	108
Fisheries	92	86	91	104
Beef	19	15	23	28
Mutton	6	6	8	10

***a: Target set by the Ninth Malaysian Plan 2006-2010**

Source: Economic Planning Unit, Ninth Malaysian Plan (2006)

Table 1.1 demonstrates the food self-efficiency in Malaysia in five years starting from 1995 to 2010. In 2010, fruits showed an increment throughout all four years, followed by vegetables and the remaining four items listed in the table. Starting from 1995 onwards, self-efficiency for fruits had increased. However, for vegetables, the rates shown were not that stable. This indicates that the level of awareness to consume fruits increases in the last 15 years. Besides the taste, fruits and vegetables are consumed because of their health benefits. Previous studies found out that health benefits are considered as the main reason for dietary recommendation in many countries (Hall, Moore, and Lynch, 2009; Pomerleau *et al.*, 2005).

The recommended intakes revealed by The US Dietary Guidelines & The Food Guide Pyramid are eating five or more servings of fruits and vegetables a day (US Department of Agriculture, 2010). Meanwhile, in Malaysia, the recommended intakes for fruits and vegetables to be consumed in a day are five servings, approximately weighed 400 grams, or equal to two servings for fruits and three servings for vegetables. To date, many developing nations are reported to have dearth data on fruits and vegetables population (Justin, Spencer, Sam, and John, 2009). England Health Survey 2009 data stated that only 25 percent of men and 29 percent of women staying in the United Kingdom consumed five or more portions of fruits and vegetables a day.

In Australia, findings in 2007 showed that only 43.5 percent of men and 56.5 percent of women consumed less than five servings of fruits and vegetables. Also, 50 percent of adults followed the fruits recommendation while only 10 percent of them followed the vegetables guidelines (Centre for Epidemiology and Research., 2007). On the other hand, results from World Health Survey 2002-2003 identified that the occurrence of low consumption of fruits and vegetables comprises about 85 percent of men and 85.5 percent of women in Malaysia (Hall *et al.*, 2009). This results validated the report prepared by Norimah *et al.* (2008) in Malaysia Adults Nutrition Survey 2003. It illustrated only 40 percent of Malaysian adults consumed 1 cup (96 grams) of green, leafy vegetables on a daily basis.

Other than that, the findings also discovered that the consumption of fruits was low among Malaysians and surprisingly fruits were not among the top ten daily consumed foods among Malaysian adults. Another research by Zakaria and Abdul Rahim (2014)

revealed that in 2003, FAO highlighted that the consumption of fruits in Malaysia were averagely between 150 grams per capita per day from 1980 to 2003. In addition, the combination of both fruits and vegetables were also reported to be 228 grams per day, far below the target for 400 grams or five servings. This scenario seems to suggest that Malaysians are having less fruits and vegetables consumption as compared to other choice of staple food like meat and rice.

Previously, numerous studies mentioned about different factors which could reflect the consumption behaviour such as personal factors and environmental (Asfaw, 2008; Johannes Brug, 2008; Morland and Filomena, 2007; Pearson, Ball, and Crawford, 2011). Other factors like accessibility and availability, social and cultural conditions, as well as financial condition had also been identified as the determinants of fruits and vegetables consumption (Asfaw, 2008; Cullen *et al.*, 2003). However, research about personal factors described that attitude and eating habits are closely related to the fruits and vegetables consumption (Lautenschlager and Smith, 2007). Other than that, a research from Stables (2001) revealed that socio-demographic factors such as age and education level are interrelated with fruits and vegetables consumption.

In Thailand, a research by Sathannoppakao, Aekplakorn, and Pradipasen (2009) specified that socio-demographic characteristics such as household income and gender did influence the fruits and vegetables consumption. To be specific, as individuals' ages increase, the amount of fruits and vegetables they consume decrease to meet the recommended intakes. Conversely, Ball, Crawford, and Mishra (2006) exposed that the trend of fruits and vegetables consumption is increasing with the advancing age. In Malaysia, very few studies had been conducted on fruits and vegetables consumption. Findings by Othman *et al.* (2012) stated that availability, social influences, and personal attitude and habits are among the effective factors to influence the consumption of fruits and vegetables.

Researcher stated that availability and easy access have great impact to adult's consumption behaviour since they play the role as a buyer who is responsible to purchase fruits and vegetables. According to Yen, Tan and Feisul (2012; 2011), socio-demographic factors namely education, age, ethnicity, income, location of residence, smoking status, and health condition did influence the consumption of fruits and vegetables. Meanwhile, Nurul Izzah *et al.* (2012) focused on exploring the consumption pattern among Malaysian adults and found out that in the state of Selangor, the most preferred fruits were bananas, apples, and watermelon. Celery, spinach, water spinach, long beans, French beans, carrots, potatoes, and Chinese mustard were reported to be among the popular vegetables. On the other hand, Othman, Ab. Karim, Karim, Adzhan, and Halim, (2013) discovered that the most preferred fruits among adults were apple, orange, banana, watermelon, and papaya. Meanwhile, among the popular vegetables were chilli, cabbage, cucumber, leaf mustard, tomatoes, and water convolvulus.

1.3 Problem Statement

To date, the Malaysian food consumption is influenced by the growth of fast food restaurants that offer high carbohydrate foods with less fruits and vegetables. Most affected places are urban area which highly dependable on cooked, processed, and ready-to-eat food. This is among the worrying issues regarding fruits and vegetables

consumption in many countries. Developed countries like United States and developing countries like Malaysia are also listed to experience this problem (Justin *et al.*, 2009). In this case, there are several studies that have already been published with regards to fruits and vegetables consumption in Malaysia as compared to United States. This is largely related to the concern about lack of awareness and knowledge on the benefits of fruits and vegetables (Norimah *et al.*, 2008).

Recently, another issue arisen due to double standard in consuming local fruits as compared to the imported fruits. According to FAMA's Director General, Datuk Mohamed Shariff Abdul Aziz, Malaysians do not take much fruits in their diet because of misconception about fruits. He argues although local fruits are rich in nutrient and fibre, the misconception of fruits must be corrected since people have stigma or prejudice over local fruits like "*durian is unhealthy*" or "*rambutan is not good for one's throat*". However, from the scientific point of view, durian which is dubbed as the king of the fruits is rich in potassium (Mohamad Azhari, 2015). This shows the gap of this research, that Malaysian adults need to be informed about the benefits of the fruits and vegetables they eat and understand the reasons of consuming them. This is the factor that is going to be explored.

In the study of fruits and vegetables consumption pattern and behaviour in Malaysia, previous research by Nurul Izzah *et al.*, (2012) found that only few studies had been conducted and the data appeared to be confounding. This shows a gap for educators and policy maker to fully pursue beyond the fundamental factors and its barriers. Additionally, Othman *et al.*, (2013) suggests to refine the instruments in different setting for example by interviewing or having focus group discussion with respondents to generalise and enrich the data collection procedures. This is especially important to study the consumer behaviour from different ethnics groups in Malaysia before starting to estimate the adequate consumption of fruits and vegetables among Malaysians to meet the world's recommended intakes.

Meanwhile, Ammerman, Lindquist, Lohr, and Hersey (2002) argues by using behavioural intervention studies, the factors involved to increase the fruits and vegetables consumption are personal, environmental, and social factors. Recently, In Malaysia, only one research has been conducted that focuses about the factors influencing fruits and vegetables consumption (Othman *et al.*, 2012). This research has been thoroughly explored using qualitative method. It is suggested that future studies measure other factors to gain more in-depth data about consumer behaviour. Generally, research on behavioural studies is useful for the policy makers and health authorities to enhance their system before comparing the data with other countries.

On the other hand, although many efforts have been taken by the Malaysian authorities in the late 1999 with the campaigns 'Eat More Vegetables' (Chin, 1999) and 'Key Message 5' (Malaysia Dietary Guidelines, 2010), the consumption of fruits and vegetables is still low below the recommended level. This issues is classified as critical because insufficient consumption of fruits and vegetables may lead to bad health condition. The World Health Organization (WHO) has revealed that 1.7 million deaths are reported annually due to the low consumption of fruits and vegetables. In addition, WHO in 2014 listed human death as top ten selected risk factors of the mortality rate worldwide. This data suggests the importance of future studies to be conducted from the perspective of Malaysians towards fruits and vegetables consumption. This is to

identify and consider some of the main factors that make individuals consume fruits and vegetables.

Identifying the factors are important as this creates chances to provide or create awareness programs among adult consumers especially in Malaysia. By understanding the consumer behaviour towards the consumption of fruits and vegetables (Deghan, Akhtar, and Merchant, 2011), this could also be a fascinating challenge among marketers and policy makers on planning a strategy to make the consumption of fruits and vegetables increase. Additionally, numerous researchers in health behaviour studies have identified attitude, social influences, habits, availability, and social-demographic factors towards fruits and vegetables consumption (de Bruijin, Kremers, van Mechelen, and Brug, 2005; Duyn and Privonka, 2000; Granner *et al.*, 2004; Joanne, Jessie and Joseph, 2007; Krebs *et al.*, 1996). In short, the understanding of the factors influencing fruits and vegetables consumption is useful in order to fulfil this study requirement and to fill the gap in this field.

1.4 Objectives of the Study

The primary goal of this study is to investigate the current practice and pattern on the consumption of fruits and vegetables among Malay, Chinese, and Indian adults in their daily lives to fit the world recommended intakes. It is also to determine whether the present consumption of fruits and vegetables towards adults in Selangor is below the recommended intake level as stated by World Health Organization, as well as to find out the factors and barriers that influence the fruits and vegetables consumption. Therefore, this study wants to accomplish the following objectives.

- i) To investigate the factors influencing fruits and vegetables consumption pattern among adults in the state of Selangor.
- ii) To examine the consumption behaviour of fruits and vegetables among adults in the state of Selangor.
- iii) To understand the barriers of fruits and vegetables consumption among adults in the state of Selangor.

1.5 Research Questions

The study was guided by the following research questions:

- i. **Research Question 1**
 - What are the factors that influence consumers' behavior to consume fruits and vegetables in Selangor?
- ii. **Research Question 2**
 - What is the consumption patterns of fruit and vegetables consumption among adults in Selangor?
- iii. **Research Question 3**
 - What are the barriers that influence adults to consume fruits and vegetables in Selangor?

1.6 Significant of the study

This study aims to investigate the consumption pattern of fruits and vegetables in the state of Selangor and the factors influencing the consumption pattern. The factors that have been studied could later be used for future implementation of any programme, designed by few sectors to help improve the fruits and vegetables consumption among adults in Malaysia. The authorities such as Ministry of Agriculture and Health could be the regulatory body in monitoring the success of these strategies. Besides that, it is suggested to create an appropriate programme to increase fruits and vegetables consumption and at the same time help to generate awareness of the importance to consume fruits and vegetables in Malaysia. The following explain about the detailed importance of this study in many areas of our lives.

1.6.1 Literature and Body of Knowledge

Malaysians are exposed to critical or chronic diseases such as cancer, diabetes, and obesity due to the style of their consumption behaviour. Stables (2001) mentions that behavioural studies are essential to be studied before researchers could proceed on health behavioural studies. This type of research is helpful to our state of health and well-being by using the appropriate theories and strategies. The information gathered in this research are particularly useful from the sight of literature and academic field in fruits and vegetables among Malaysians. The findings from this research help to improve past literature and at the same time provides the insights on current behaviours among Malaysian based on their choice of fruits and vegetables within the target population. In this sense, this study contributes to a new body of knowledge in Malaysia.

1.6.2 Fruits and Vegetables Marketers

The findings of this research leave a huge implication on market research while at the same time deliver significant information to companies involved in fruits and vegetables market. This is important for the marketers to understand the nature of consumers' preferences and consumption pattern. Besides that, it provides good feedbacks from consumers' side to overcome the barrier from the marketers' side. This action helps the marketers to improve their strategies in the market of fruits and vegetables. In addition, it is crucial for the food and beverages industry to introduce and encourage high consumption of fruits and vegetables via campaigns organised by health and food authorities. To date, consumers prefer having healthier and balanced food intake. It is important to hasten the demand of products containing high fresh fruits and vegetables as their ingredients. In short, the findings of this research are valuable in aiding the marketers towards developing effective marketing strategies particularly in Malaysia.

1.6.3 Health Authorities

The importance of fruits and vegetables has been highlighted by WHO in 2014, describing that low consumption of fruits and vegetables are listed as one of the top 10 risk factors which contribute to the mortality rate. These problems lead to the micronutrient deficiency and increase the risks of towards mortality and morbidity due to bad diet (Pomerleau *et al.*, 2005). In Malaysia scenario, minor policy attention has been launched such as the 'Eat More Vegetables' campaign in the late 1999 by the Ministry of Agriculture. The impact of this campaign was interrelated with the consumption of vegetables which demonstrated the increase of vegetables intake from 26.2 percent to 49.2 percent from year 1990 to 2005. This finding was used to recommend the health authorities in Malaysia to improve the current policies in promoting and enabling greater fruits and vegetables consumption (Warr, Rodriguez, and Penm, 2008).

Apart from that, it is essential to educate about the importance of fruits and vegetables in the diet regime among Malaysians. Ample nutrition programme should be enacted to inspire adults to increase their fruits and vegetables consumption. Since health authorities play an important role in order to avoid negative influences from individuals and environments on health, it has also become the responsibilities of societies to help their members to lead a healthy life. In conclusion, the elements which have great impacts on health behaviour studies are educational strategies which help to increase the level of motivation, improve awareness, as well as the provision of new environment on having a healthy food choice by introducing variety ways of consuming fruits and vegetables especially in terms of availability and accessibility at home (Stables, 2001). It is hoped that the results of the study would help to contribute information for health authorities to promote essential dietary behaviour among adults in the future.

1.7 Scope of Study

This research implements the factors discovered by previous researchers such as personal and environmental factors. These factors are used to identify the reasons influencing the fruits and vegetables consumption. The consumption behaviour measures on how much, why, and when to consume fruits and vegetables. The consumption pattern and the factors influencing the fruits and vegetables consumption are identified using qualitative method through focus group and in-depth interview among adults aged 18 to 59 years old who love to consume fruits and vegetables; based on the options between frequently or preferred, and has been narrowed down to Malay, Chinese, and Indian residing in the state of Selangor state.

1.8 Summary of Chapters

This thesis consists of five chapters including introduction, literature review, research methodology, results, as well as discussion and conclusion. First and foremost, chapter one highlights the research background by highlighting the definition of fruits and vegetables, the current scenarios of fruits and vegetables consumption across the world, and global issues related to the consumption behaviour. It is then followed by the

problem statement outlining the current issues on the consumption of Malaysian adults but only limited to few publications. Also, the problem statement integrates with the importance of documenting the Malaysian adult's consumption of fruits and vegetables. Secondly, chapter two begins with the definition of consumer behaviour and their consumption pattern. Later, this chapter discusses and reviews previous studies, theories, and models used in this study.

The literature review continues by introducing Malaysia as a multicultural nation with in-depth explanation about its three major ethnic groups namely Malay, Chinese, and Indian. The issues related to the consumption of fruits and vegetables around the world are also highlighted in this chapter. This literature review ends by highlighting the summary of research in the fruits and vegetables case study. Next, chapter three mentions the methodology used in this research for the purpose of data collection. This study employs qualitative method strategy. The discussion starts with the definitions of every method, followed by explanations of the qualitative study. Techniques of eliciting data is going to be the next. Finally, this chapter continues with the methodology of analysis using the constant comparative method. This chapter also discusses on how the researcher analyses the data.

Both results and the analysis of study are used to write chapter 4. On the other hand, chapter four consists of the results and discussions of this research. The data that has been analysed are elaborated here. Research questions are used as guidelines to present the discussions on this study's results and analysis. Finally, chapter five covers the findings, conclusion, and recommendations of this research. The justifications from the results are highlighted in a few sections or themes. They are the factors influencing fruits and vegetables consumption, the patterns of fruits and vegetables consumption, and the barriers to consume fruits and vegetables. These themes are all related to the problem-solving step that could benefit the fruits and vegetables marketer and Malaysia's Ministry of Health. Apart from that, limitations and suggestions of the research for future studies are also provided in this section. At the end of the discussion, a comprehensive summary or conclusion is elaborated.

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