UNIVERSITI PUTRA MALAYSIA

FACTORS INFLUENCING FRUIT AND VEGETABLE CONSUMPTION BEHAVIOUR OF URBAN ADULTS IN MALAYSIA

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By

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

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Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfillment of the requirements for the Degree of Master of Science

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September 2014

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Fruits and vegetables are an important part of a healthy diet because they contain low energy density and sources of micronutrients, fibres and other components of functional properties. Despite the benefits of fruits and vegetables, the consumption among Malaysian adults is still low due to lack of public knowledge's on the fruits and vegetables benefits. Thus, an appropriate influential factors need to be identified and considered to increase the consumption of fruits and vegetables in Malaysia. Notwithstanding, there is a dearth of literature on fruits and vegetables, purchasing behaviour and the factors influencing the consumption behaviour. Therefore, this study aims to narrow down the gap by identifying factors that influenced fruits and vegetable consumption and purchasing behaviour. Subsequently, the study was designed to meet four proposed objectives. Firstly, the study aimed to determine the significant relationship on personal factors towards adult's intention to consume fruits and vegetables. The second objective was to determine the significant relationship on environmental factors towards adult's intention to consume fruits and vegetables. Further, the third objective was to analyse the significant mean differnces of socio demographic factors towards adult's intention to consume fruits and vegetables. Finally, the fourth objective was build to compare the consumption pattern and purchasing behaviour of different socio-demographic factors.

A quantitative study by using a survey questionnaire was chosen because it is accurate in measuring the attitude, behaviour and identifies the relationship of factors involved. The study was supported by Social Cognitive Theory. Malaysian adult aged between 18 to 59 years old were selected based on convenience sampling in selected cities in shopping complexes in Malaysia. Subsequently, the proportion was made to identify the accurate number of adults. Out of 1200 questionnaires were distributed, 1049 were useable and the response rate was 87.4%. Data were analysed by using Factor Analysis, Multiple

Linear Regressions, Independent Sample T-Test, and one-way ANOVA to answer the research objectives

The findings revealed that attitude, habit, social influences, and availability have significant relationship fruits and vegetables consumption behaviour. Females were found to have higher interest than their male counterpart in all those predictors. It indicates that females were more health conscious than men. Results found that the most preferred fruits among adults in Malaysia were apple, banana, orange, watermelon, and papaya. Meanwhile, chilli, cabbage, cucumber, mustard leaf, tomatoes, and water convolvulus were the most frequently consumed vegetables. It was also noted that Malaysian adults commonly purchased fruits and vegetables in supermarkets. It is proposed that, in increasing the production and supply of higher demand fruits to increase the availability and continuous supply of fruits and vegetables. By segmenting the fruits and vegetables markets among adults based on the influencing factors, empirical and theoretical suggestions can be useful for marketers and stakeholders. They can consider the consumer profile on likely to consume the different types of fruits and vegetables in selected cities and determining the potential type of fruits and vegetables that will be marketed in selected areas. Meanwhile, health authorities can use the findings to improve future policies in fruits and vegetables in order to promote and facilitate greater fruits and vegetables consumption.

Keywords: Consumption and purchasing behaviour; factors influencing; personal factors; environmental factors.

Abstrak tesis yang dikemukan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk Ijazah Master Sains

FAKTOR-FAKTOR YANG MEMPENGARUHI TABIAT PENGAMBILAN BUAH DAN SAYUR DI KALANGAN PENDUDUK BANDAR DEWASA DI MALAYSIA

Oleh,

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Buah-buahan dan sayur-sayuran adalah unsur penting kepada pemakanan yang sihat kerana mengandungi jumlah ketumpatan tenaga yang rendah, sumber mikronutrien, serat dan komponen tambahan yang penting. Meskipun buah-buahan dan sayur-sayuran mengandungi pelbagai kebaikan, pengambilan di kalangan orang dewasa di Malaysia adalah rendah disebabkan kurangnya pengetahuan tentang kebaikan memakan buah-buahan dan sayur-sayuran. Justeru itu,faktor-faktor yang mempengaruhi pengambilan perlu dikenal pasti kerana ia dapat meningkatkan pengambilan buah-buahan dan sayur-sayuran di Malaysia.Selain daripada itu, terdapat kekurangan bahan dan maklumat berkenaan buah-buahan dan sayur-sayuran dalam mengkaji tabiat pembelian dan faktor-faktor yang mempengaruhi tabiat pengambilan. Oleh hal yang demikian, kajian ini bertujuan untuk mengenal pasti faktor-faktor yang mempengaruhi tabiat pengambilan dan pembelian buah-buahan dan sayur-sayuran. Seterusnya, kajian ini direka untuk memenuhi empat objektif yang dicadangkan. Objektif pertama, adalah untuk mengenalpasti kesan daripada faktor-faktor peribadi terhadap pengambilan buah-buahan dan sayur-sayuran. Objektif kedua adalah untuk mengenalpasti kesan daripada faktor luaran terhadap pengambilan buah-buahan dan sayur-sayuran.Seterusnya, objektif ketiga ialah untuk menganalisis faktor sosio-demografi terhadap tabiat pengambilan buah-buahan dan sayur-sayuran. Akhir sekali kajian dijalankan untuk membandingkan tingkah laku pengguna terhadap pengambilan dan pembelian buah-buahan dan sayur-sayuran berdasarkan faktor sosio-demografi .

Soal selidik menggunakan kaedah kuantitatif telah dijalankan kerana ia adalah bertepatan dalam mengkaji tabiat dan mengenal pasti faktor yang terlibat. Kajian ini berpandukan Teori Kognitif Sosial. Orang dewasa yang berusia 18 hingga 59 tahun telah dipilih sebagai responden kajian berdasarkan persampelan mudah di kompleks membeli belah di bandar-bandar terpilih di Malaysia. Seterusnya kaedah pembahagian

telah digunakan untuk menentukan jumlah reponden yang terlibat. Daripada 1200 responden hanya 1049 kertas soal selidik mewakili kadar maklumbalas sebanyak 87.4% telah digunakan untuk dianalisis . Data dianalisis menggunakan Terurus Pelbagai Linear, Ujian T,dan Satu Kaedah ANOVA untuk menjawab objektif kajian .

Dapatan kajian menunjukkan bahawa sikap, tabiat ,pengaruh sosial , dan ketersediaan adalah penting dalam pengambilan buah-buahan dan sayur-sayuran di Malaysia. Wanita didapati mempunyai keinginan yang lebih tinggi untuk mengambil buah-buahan dan sayur-sayuran daripada lelaki dalam semua faktor . Ini menunjukkan bahawa wanita lebih mementingkan faktor kesihatan berbanding lelaki. Kajian mendapati bahawa buah-buahan yang paling digemari di kalangan orang dewasa di Malaysia adalah epal ,pisang, oren, tembikai, dan betik. Sementara itu, cili ,kubis, timun , tomato,sawi, dan kangkung adalah sayur-sayuran yang paling kerap diambil. Pasaraya pula menjadi tempat yang dipilih untuk membeli buah-buahan dan sayur-sayuran. Cadangan dalam meningkatkan pengeluaran dan bekalan adalah penting untuk memenuhi faktor ketersediaan dan bekalan yang berterusan untuk memenuhi permintaan buah-buahan dan sayur-sayuran. Dengan mengelaskan faktor-faktor yang mempengaruhi tabiat pengambilan buah-buahan dan sayur-sayurandi kalangan dewasa di Malaysia , cadangan empirikal dan teori adalah berguna kepada pihak pemasar dan badan yang berkepentingan. Pihak-pihak yang berkenaan dapat menilai profil pengguna yang kompleks dalam tabiat pengambilan pelbagai jenis buah-buahan dan sayur-sayuran serta menentukan potensi buah-buahan dan sayur-sayuran yang akan dipasarkan di di bandar-bandar terpilih. Sementara itu, pihak yang berwajib yang berhubungkait dengan kesihatan boleh menggunakan dapatan untuk memperbaiki dasar dalam pengambilan buah-buahan dan sayur-sayuran untuk menggalakkan pemakanan buah-buahan dan sayur-sayuran.

Kunci kata: Tabiat pengambilan dan pembelian, faktor-faktor yang ,mempengaruhi, faktor-faktor peribadi dan faktor-faktor persekitaran.

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I certify that a Thesis Examination Committee has met on 17 September 2014 to conduct the final examination of Khairunnisa Izzati binti Othman on her thesis entitled "Factors Influencing Fruit and Vegetable Consumption Behaviour of Urban Adults in 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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This thesis was submitted to the Senate of Universiti Putra Malaysia and has been accepted as fulfillment of the requirement for the degree of Master of Science. The members of the Supervisory Committee were as follows:

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CHAPTER 1

INTRODUCTION

1.1 Introduction

This chapter contains the background of behavioural studies and the current consumption of fruits and vegetables in Malaysia. The chapter comprises the background of the study, problem statements, research objectives, and the significance of the study.

1.2 Background of Study

Fruits and vegetables contain vitamins, minerals, and rich source of dietary fibre that are essential to promote healthy diet (Chatzi, Apostolaki, Bibakis, Skypala, Liakou, Tzanakis, Cullinan, 2009). Consuming an adequate amount of fruits and vegetables will reduce the risk of 31 percent of ischemic heart disease, 20 percent of esophageal cancer, 19 percent of ischemic stroke, 19 percent of gastric cancer, and 12 percent of lung cancer (Lock, Pomerleau, Causer, Altmann, & McKee, 2005). Based on the data from the Ministry of Health Malaysia (2010), ischaemic heart disease has contributed to the high mortality rate in Malaysia. Consequently, by increasing the consumption of fruits and vegetables, the rate of mortality will decrease and help to reduce the medical care costs. Additionally, those who consume less fruits and vegetables contribute to the prevalence of obesity and overweight (Epstein, Gordy, Raynor, Beddome, Kilanowski, & Paluch, 2012).

The health benefits of fruits and vegetables found in previous studies are the main reason for the dietary recommendations in many countries (Hall, Moore, Harper, & Lynch, 2009; Lock et al., 2005).The US Dietary Guidelines and the Food Guide Pyramid recommend eating five or more servings of fruits and vegetables a day (US Department of Agriculture, 2010). In Malaysia, the recommended intake of fruits and vegetables is five servings, which is approximately 400 g, and this is equivalent to two servings for fruits and three servings of vegetables a day (Malaysia Dietary Guidelines, 2010). However, many developing nations lack the data on fruits and vegetable consumption in their populations (Justin, Spencer, Sam, & John, 2009). The data from the England Health Survey (2009) exposed that only 25 percent of men and 29 percent of women in the United Kingdom were reported to consume five or more portions of fruits and vegetables a day. In the United States, the data from the National Centre of Health Statistics Health, United States (2005) showed that 32.5 percent of adults consumed fruits two or more times per day and 26.3 percent consumed vegetables three or more times per day. Meanwhile, the results from the World Health Survey in 2002 to 2003

found the prevalence of low consumption of fruits and vegetables was about 85 percent for men and 85.5 percent for women in Malaysia (Hall et al., 2009).The result of Hall et al., (2009) also corroborated with the report from Norimah et al. (2008) in Malaysia Adult Nutrition Survey in year 2003 showed only 40 percent of Malaysian adults consumed 1 cup (96 g) of green leafy vegetables every day. The findings also revealed that consumption of fruits is still low among Malaysians, and fruits are not among the top ten daily consumed foods among Malaysian adults.

Previous studies have suggested that there are different factors that affect consumption behaviours, such as environmental and personal factors (Asfaw, 2008; Hearn, Baranowski, Baranowski, Doyle, Smith, Lin, Resnicow, 1998; Morland & Filomena, 2007). Availability and accessibility, social condition, as well as cultural condition, including financial situation, are the determinants for fruits and vegetables consumption (Asfaw, 2008; Cullen et al., 2003). Studies related to personal factors that affect fruits and vegetables consumption can be inferred from Lautenschlager and Smith (2007), who indicated that the attitude and eating habits are correlated to intention to consume more fruits and vegetables. A research conducted among adults in America by Stable (2001) found that socio-demographic factors, such as age and education level, were highly significant factors towards fruits and vegetables consumption.

Findings from a study by Yen, Tan, and Feisul (2012) attempted to profile respondents who exposed their daily consumption of fruits and vegetables, focused on socio-demographic factors by using logistic regression. The findings suggested that working hours, education, age, ethnicity, income, gender, smoking status, and location of residence have significant correlation with fruit consumption, while income, gender, health condition, and location of residence were found significant in consumption of vegetables. This is supported by previous studies that there is a significant difference in socio-demographic attributes towards consumption of fruits and vegetables (Granner, Sargent, Calderon, Husssey, Evans, Watkins, 2004; Thompson, Margetts, Speller, & McVey, 1999). Satheannoppakao, Aekplakorn, and Pradipasen (2009) revealed the significant socio-demographic characteristics that were linked to the recommended fruits and vegetables consumption in Thailand, such as household income and gender. They also stated that as one's age increased, it was less likely he/she met the recommended fruits and vegetables consumptions. On the contrary, a study by Ball, Crawford, and Mishra (2006) discovered an increasing trend of fruits and vegetables consumption with advancing age.

Previous researches also supported that food purchasing behaviour has the direct effect of consumption (Blistein, Snider, & Evans, 2012; French, Shimotsu, Wall & Gerlach, 2008). Purchasing behaviour elucidates purchasing patterns, which is determined by evaluating food and beverage purchases from all food sources (French et al., 2008). The driving key forces towards fruits and vegetables market are because of the consumers' standards of living (Kowtaluk & Kopan, 2004), health benefits (Hartog, Staveren, & Brouwer, 2006; Grunert, Larsen, Madsen, & Baadsgaarad, 1996), and value of food (Alden, Steenkamp, & Batra, 2007). Besides, socio-demographic changes (Warwick, Mcllveen, & Strugnell, 1999), level of knowledge, and household income have been gradually affecting the fruits and vegetables market (Churchill & Brown, 2007).

Personal factors, such as attitude, have gained prominence in the literature as Middelton (2007) found that they correlated with the intention to purchase fruits and vegetables.

1.3 Problem Statement

Food consumption behaviour will be influenced by many interrelating factors including personal and environmental factors in the context within the choice is made and not only entirely by physiological and nutritional needs (Shephard, 1999). Commonly, the Malaysian food consumption practices, especially in urban area depends more on cooked, processed, ready to eat and fast food restaurants which contributed to high carbohydrate food consumption and less amount of fruits and vegetables. Recent concerns about the low public's knowledge of benefits on regards to fruits and vegetables (Normah et al.,2008). Consequently, inadequate consumption of fruits and vegetables increases the chances of gastrointestinal cancer by 14%, stroke death by 9%, and ischaemic heart disease death by 11%, whereby these are the major chronic diseases suffered among Malaysians (Ministry of Health Malaysia, 2010). Additionally, Nurul Izzah et al. (2012) also stated that there is a limited study area and confounding data in fruits and vegetables consumption behaviour in Malaysia and this is the gap for public health educators and policy makers to fully understand its factors and barriers. Previous studies found that some variables affect to consumption behaviour of consumers such as personal and environmental factors (French et al., 2008; Asfaw, 2008; Hearn et al., 1998; Morland & Filomena, 2007). Meanwhile, Ammerman, Lindquist, Lohr, and Hersey (2002) stated that behavioural intervention studies, which linked to personal, environmental, and social factors, have shown 77 percent significant effects in increasing fruit and vegetable consumption in North America, Europe, and Australia. To date, In Malaysia, no study has specific analysed factors influencing fruits and vegetables consumption (Nurul Izzah et al., 2012). Therefore, the findings from the behavioural studies on fruits and vegetables consumption are very important among policy makers, health authorities and ministry to be implemented and compared from other continents.

Despite the efforts that have been put in place by the authorities in the past few years, such as the campaign 'Eat More Vegetables' (Chin, 1999), the consumption of fruits and vegetables is still low and below the recommended level. This is a critical issue because insufficient consumption of fruits and vegetables leads to undesirable health conditions. This fact is supported by the World Health Organization (WHO), which reported that there were 1.7 million deaths annually caused by low consumption of fruits and vegetables, and it has become the top ten selected risk factors of mortality worldwide (WHO, 2014). This evidence suggests the necessity to increase the fruits and vegetables consumption among Malaysian by identifying and consider the factors that an individual will or not choose to consume fruits and vegetables that possibly could create awareness among consumers. This generates an interesting challenge among the policy makers and marketers on the ways to increase the consumption of fruits and vegetables by understanding the behaviour of fruits and vegetables consumption (Dehghan, Akhtar, & Merchant, 2011). For instance, health behaviour researches have focused on attitude, habit, social influences, availability, and socio- demographic factors related to fruits and

vegetables consumption (de Bruijn, Kremers, van Mechelen, &Brug, 2005 ; Granner et al., 2004; Duyn, & Pivonka, 2000). Therefore, identifying the consumption behaviour factors have been recognized as a priority area for future behavioural research in increasing consumption, particularly those that focused on personal, environmental, and socio-demographic factors that are related to fruits and vegetables consumption (Brug, Oenema, & Ferreire, 2005; Duyn & Pivonka, 2000; Joanne, Jessie, & Joseph, 2007; Krebs et al., 1996). A better understanding on the factors that influence fruits and vegetables consumption may aid the promotion of healthful food choices.

1.4 Research Objectives

Understanding of factors influencing food consumption behaviour is an approach to increase fruits and vegetables consumption in Malaysia. Hence, in order to know about the understanding of Malaysian behaviour towards consuming fruits and vegetables, the general objective of this study aimed to evaluate the factors that influence fruits and vegetables consumption behaviours in Malaysia.The specific objective were designed to determine the factors that influenced fruits and vegetables consumption behaviour, including personal and environmental factors.The specific objectives of this research are:

- To determine the relationship of personal factors towards adults' intentions to consume fruits and vegetables.
- To determine the relationship of environmental factors towards adults' intentions to consume fruits and vegetables.
- To analyse the significant differences of socio-demographic factors towards adults' intentions to consume fruits and vegetables.
- To compare the consumption pattern and purchase behaviours of different socio demographic variables among adults.

1.5 Significance of Research

The factors studied are shown to be predictive in planning and implementing a programme designed to help increase fruits and vegetables consumption among adults in Malaysia. These factors could potentially be addressed and applied by the authorities like the Ministries of Agriculture and Health to design an intervention programme to increase the consumption of fruits and vegetables, as well as increase the awareness of the importance to consume fruits and vegetables in Malaysia. The are three main authorities are affected from this study; academic and body of knowledge, fruits and vegetables marketers and health authorities.

1.5.1 Academics and Body of Knowledge

The risks of Malaysian adults to develop critical chronic diseasese as such cancer and diabetic are closely tied to their consumption behaviour. Stables (2001) discussed behaviour studies focuses on health behaviour studies is a set of learning experiences to facilitate the voluntary adoption and nutrition on related behaviours that conducive to health and well-being based on appropriate theory and prior research. The information derived from this study will be a significant in addition of literature and academics field in fruits and vegetables consumption behaviour among Malaysian. The findings may bring up to date the current behaviour and human choice in fruits and vegetables in target the population. Briefly, this study will also contribute to a new body of knowledge in Malaysia and extend the body of literature in fruits and vegetables consumption behaviour.

1.5.2 Fruits and vegetables marketers

The findings of this study would have significant implications on market research and it is vital for companies dealing with fruits and vegetables to understand the complexity of consumers' preferences and consumption behaviours. Besides, this study would help marketers in determining the potential types of fruits and vegetables that could be marketed in selected areas. It should be noted that the growing demand for food and beverages with high content of fruits and vegetables is related to the campaigns organised by the health and food authorities. More consumers are striving for a healthier and more balanced food intake, thus, accelerating the demand for products that contain high fruits and vegetables as their ingredients. In a nutshell, the findings from this study could assist marketers in developing marketing strategies.

1.5.3 Health authorities

The WHO (2014) has ascertained that low consumption of fruits and vegetables as one of the top 10 risk factors contributing to mortality. The micronutrient deficiencies caused by the low consumption of fruits and vegetables increase the risk of mortality and morbidity in an unhealthy diet (Pomerleau, Lock, & McKee, 2006). In Malaysia, only minor policy attention had been launched, such as the 'Eat more vegetables' campaign, in 1999 by the Ministry of Agriculture. The campaign claimed to have had significant effects as the consumption of vegetables increased from 26.1 to 49.2 calories from year 1990 to 2005 (Warr, Rodriguez, & Penm, 2008). Besides, the health authorities were able to use the findings to improve policies in promoting and facilitating greater fruits and vegetables consumption, and to educate Malaysians on the importance of fruits and vegetables in their diet. A comprehensive nutrition programme should be enacted in order to encourage adults to consume more fruits and vegetables. Health policies that alleviate the negative influence of the person and environment on health are important aspects of any society's ability to help its member attain better health. In sum, the elements affect the effectiveness of health behaviour studies were educational strategies for enhancing awareness and motivation, environmental approaches such as changing the environment by making healthy food choice, especially fruits and vegetables more available and accessible at home (Stables, 2001).

1.6 Scope of the Study

The study adopted the personal and environmental factors that were found by previous researchers to determine the factors that influenced fruits and vegetables consumption behaviour. The consumption behaviour was measured by looking at the intentions to consume fruits and vegetables. Besides, the consumption and purchase patterns were identified by using questionnaires among adults at selected cities in Malaysia. Meanwhile, the selection criterion for respondents based on voluntary participation was aged 18-59 years old, who consumed fruits and vegetables, and was narrowed to Malaysia citizens.

1.7 Organization of the Study

The thesis is divided into five chapters. The first chapter highlights the statement of problem in the consumption of fruits and vegetables, where it found insufficient of literature that looked into the factors that influenced fruits and vegetables consumption behaviour in Malaysia. It also covers the objectives and the significance of the study. Chapter 2 reviews the current literature to provide a theoretical background for the research framework, and hypotheses are proposed. Chapter 3 discusses the method used in this research. Chapter 4 presents the empirical findings on the factors that influenced fruits and vegetables consumption among adults in Malaysia. The final chapter addresses the conclusion, as well as the recommendations and implications.

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