UNIVERSITI PUTRA MALAYSIA

ASSOCIATIONS BETWEEN SOCIODEMOGRAPHIC PROFILES, NUTRITION KNOWLEDGE, ATTITUDE AND PRACTICES ON HEALTHY EATING WITH BODY WEIGHT STATUS AMONG ADULTS IN MALAYSIA

SHARINA FARHANA BINTI MOHD MERAH

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SHARINA FARHANA BINTI MOHD MERAH

DEPARTMENT OF DIETETICS

FACULTY OF MEDICINE AND HEALTH SCIENCES

UNIVERSITI PUTRA MALAYSIA 2020/2021

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BY:

SHARINA FARHANA BINTI MOHD MERAH

A project submitted as partial fulfilment of the requirement for the degree of Bachelor of Science in Dietetics with Honours from the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

This project submitted as partial fulfilment of the requirement for the degree of Bachelor of Science in Dietetics with Honours from Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. This project entitled “Associations between Sociodemographic Profiles, Nutrition Knowledge Attitude and Practices on Healthy Eating with Body Weight Status among Adults in Malaysia” was prepared by Sharina Farhana Binti Mohd Merah and submitted to the Faculty of Medicine and Health Sciences as partial fulfilment of the requirement for the degree of Bachelor of Science in Dietetics with Honours from the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

Received and examined by:

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(Dr. Zuriati Ibrahim)

DR. ZURIATI IBRAHIM
Senior Lecturer & Dietitian
Department of Dietetics
Faculty of Medicine and Health Sciences
Universiti Putra Malaysia
43400 Serdang, Selangor

Date: 1st October

ACKNOWLEDGEMENT

First and foremost, I would like to thank Almighty for His blessings throughout my research. My research would have been possible without my supervisor, Dr Zuriati Ibrahim for providing invaluable assistance and insights throughout the process of completing this research. I would like to express my utmost gratitude to my supervisor who personally guided me to complete my research. It was a great honour to work and study under my supervisor's provision.

At the same time, I would like to thank my friends for their endless support and help throughout this research. Not forgetting my groupmates Afiqah, Muhaimin and Nabihah who support one another throughout the Bachelor's Dissertation journey. Last but not least, I am grateful for my family's unconditional, unequivocal, and loving support throughout this research.

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ABSTRACT

Associations between Sociodemographic Profiles, Nutrition Knowledge, Attitude and Practices on Healthy Eating with Body Weight Status among Adults in Malaysia

Sharina Farhana Binti Mohd Merah

Introduction: Obesity and overweight are unimaginably serious problems becoming more prevalent in Malaysia, which will significantly impact the upcoming generations, as it increases the risk of developing chronic diseases. This study aims to determine the socio-demographic factors, nutrition knowledge, attitude, practice on healthy eating among Malaysian adults, determine the body weight status of Malaysian Adults, determine the associations between sociodemographic factors, nutrition knowledge attitudes and practice of healthy eating with body weight status among Malaysian adults. **Methods:** A cross-sectional study was conducted among 200 respondents. The online survey was carried out by using a non-probability sampling method called snowball method. The self-administered online questionnaire consists of 5 sections: the socio-demographic profiles, anthropometric measurements, nutrition knowledge, attitude, and practice on healthy eating. **Results:** Most participants were Malay, Muslim, female with age range 20 – 29 years old where the mean age is 24.14 ± 6.63 years old. Majority of the participants were single, student with tertiary education level under B40 family income group. Participants have a good nutrition knowledge (65%) while poor nutrition attitude (83%). For nutrition practice, the mean for participants' confectionery intake were 2.42 ± 1.73 days, fruit intake were 3.74 ± 1.93 days, vegetables intake were 4.72 ± 2.16 days and plain water intake 6.71 ± 1.12 days. The mean for serving size of participants' confectionery intake were 1.79 ± 1.36, fruits intake were 2.15 ± 1.44, vegetables intake were 2.38 ± 1.66 and plain water intake were 6.20 ± 2.93. The mean for the number of days participants' consumed breakfast were 4.75 ± 2.19, lunch were 6.28 ± 1.31 and dinner were 5.87 ± 1.64. About half of the participants (46%) were overweight and obesity. Young, female, single and unemployed participants are more likely to develop overweight and obesity where p = 0.002, p = 0.014, p = 0.006 and p = 0.014 respectively. No correlation found between nutrition knowledge (r = -0.077, p = 0.279), nutrition attitude (r = 0.093, p = 0.331), frequency of food intake, serving size of fruit and vegetables intake, meal skipping, p > 0.05 with body weight status. Correlation was found between confectionery (r = 0.154, p = 0.030) and plain water intake (r = 0.185, p = 0.009), p < 0.05 with body weight status. **Conclusion:** Nutrition practice slightly contributes to the rising of overweight and obesity among Malaysian adults while nutrition knowledge and attitude are vice versa. However, more research needed to be conducted to find possible confounding factors that influence the rising of overweight and obesity rates and specified the nutrition practice approach since the findings slightly contradict than previous local and international studies.

ABSTRAK

Associations between Sociodemographic Profiles, Nutrition Knowledge, Attitude and Practices on Healthy Eating with Body Weight Status among Adults in Malaysia

Sharina Farhana Binti Mohd Merah

Pengenalan: Obesiti dan berat badan berlebihan merupakan suatu masalah serius yang tidak dapat dibayangkan yang semakin berleluasa di Malaysia, dimana ianya membawa kesan buruk kepada generasi akan datang kerana ia meningkatkan risiko terkena penyakit kronik. Kajian ini bertujuan untuk menentukan faktor sosio-demografi, pengetahuan, sikap, amalan pemakanan yang sihat dalam kalangan orang dewasa Malaysia, menentukan status berat badan orang dewasa di Malaysia, menentukan perkaitan antara faktor sosiodemografi, pengetahuan, sikap dan amalan pemakanan yang sihat dengan status berat badan dalam kalangan orang dewasa Malaysia. **Kaedah:** Kajian keratan rentas dijalankan dalam kalangan 200 responden. Tinjauan dalam talian dilakukan dengan menggunakan kaedah persampelan bukan kebarangkalian yang dikenali sebagai kaedah 'snowball'. Borang soal selidik terdiri daripada 5 bahagian: profil sosio-demografi, pengukuran antropometrik, pengetahuan pemakanan, sikap, dan amalan pemakanan sihat. **Keputusan:** Sebilangan besar peserta terdiri daripada orang Melayu, Islam, wanita dalam lingkungan umur 20 - 29 tahun di mana rata-rata usia mereka adalah 24.14 ± 6.63 tahun. Sebilangan besar peserta juga adalah bujang, pelajar dengan tahap pendidikan yang tertinggi di bawah kategori pendapatan keluarga B40. Peserta mempunyai pengetahuan pemakanan yang baik (65%) sementara sikap pemakanan yang buruk (83%). Untuk amalan pemakanan, min bagi pengambilan konfeksi peserta adalah 2.42 ± 1.73 hari, pengambilan buah adalah 3.74 ± 1.93 hari, pengambilan sayur-sayuran adalah 4.72 ± 2.16 hari dan pengambilan air kosong adalah 6.71 ± 1.12 hari. Purata saiz hidangan pengambilan konfeksi peserta adalah 1.79 ± 1.36, saiz hidangan buah adalah 2.15 ± 1.44, saiz hidangan sayur-sayuran adalah 2.38 ± 1.66 dan saiz hidangan air kosong adalah 6.20 ± 2.93. Purata jumlah hari peserta mengambil sarapan adalah 4.75 ± 2.19 hari, makan tengah hari adalah 6.28 ± 1.31 hari dan makan malam adalah 5.87 ± 1.64 hari. Kira-kira separuh daripada peserta (46%) mempunyai berat badan berlebihan dan obesiti. Peserta muda, wanita, bujang dan menganggur cenderung mengalami kegemukan dan obesiti di mana masing-masing $p = 0.002$, $p = 0.014$, $p = 0.006$ dan $p = 0.014$. Tiada perkaitan antara pengetahuan pemakanan ($r = -0,077$, $p = 0,279$), sikap pemakanan ($r = 0,093$, $p = 0,331$), kekerapan pengambilan makanan, saiz hidangan pengambilan buah dan sayur, pengambilan makanan, $p > 0,05$ dengan badan status berat badan. Perkaitan didapati antara konfeksi ($r = 0.154$, $p = 0.030$) dan pengambilan air kosong ($r = 0.185$, $p = 0.009$), $p < 0.05$ dengan status berat badan. **Kesimpulan:** Amalan pemakanan sedikit sebanyak menyumbang kepada peningkatan berat badan berlebihan dan obesitu dalam kalangan orang dewasa di Malaysia manakala pengetahuan dan sikap pemakanan adalah sebaliknya. Walau bagaimanapun, lebih banyak kajian perlu dijalankan untuk mencari faktor-faktor yang mungkin mempengaruhi kenaikan kadar berat badan berlebihan dan obesiti dan menentukan pendekatan amalan pemakanan kerana penemuan ini sedikit bertentangan dengan kajian tempatan dan antarabangsa.

CHAPTER 1: INTRODUCTION

1.1 Background of Study

Body weight status is known as body mass index (BMI), a screening tool normally used to determine and evaluate body weight status concerning the possible risk of serious chronic diseases. Even though body weight status can be a potential indicator of health risk, it is not utilised in diagnosing chronic diseases. A significant amount of body fat content can cause weight-related illnesses that could lead to other serious chronic diseases (Centers for Disease Control and Prevention, 2020).

Excessive weight which can be classified as overweight or obesity, has become the sixth leading cause of diseases worldwide. It was predicted that in 2020, the number of adults with overweight and obesity would expand compared to the last decade. It is also estimated that about 5 million adults are at risk of death in 2020. Overweight is classified as a BMI of 25 to 29.9 kg/m2, while obesity is classified as a BMI of >30 kg/m2 (Malta et al., 2014).

Obesity and overweight are among the most leading public health concerns in the United States, where the prevalence of overweight and obesity has grown since the early 1990s and doubled as the year increases. Almost 30% of American citizens are obese, and 64% of them are overweight. The factors that cause obesity is so widespread in the United States are poor eating patterns and dietary practices (U.S. Food and Drug Administration, 2004). Obesity has been linked to an increase in the chance of developing various illnesses such as high blood pressure, type 2 diabetes, heart disease, stroke, gallbladder disease, and breast, prostate, and colon cancer (National Institute of Diabetes and Digestive and Kidney Diseases, 2004).

Ramachandran and Snehalatha (2010) have stated that obesity and overweight are unimaginably severe problems whose incidence is increasingly growing in most developed and developing countries that have caused many health consequences to people who are obese and overweight. It can be seen that India has the most significant number of people suffering from diabetes followed by China, where the primary cause of this health issue arises from obesity. Countries such as Japan and Indonesia are in the primary stage of the health risks among their population while countries such as Malaysia, Japan and Hong Kong are in the headway stage of the health risks.

Malaysia has been an icon for economic development as it has gone through a tremendous pace of industrialisation and urbanization in the past two decades (Ismail et. al., 2002). Socioecenomic of country cause rising of overweight and obesity prevalence in whole world. In that case, Malaysia is an upper-middle income country progressing toward a high-income country in economic has indirectly contributes to the growing threat of overweight and obesity epidemic. Malaysia is predicted to experience a huge overweight and obesity transitions by 2020. The escalating overweight and obese rates in Malaysia presently reached the highest in the south-east Asian area (Mariapun et. al., 2018). The rise of prevalence of obesity and overweight in Malaysia is due to the food in Malaysia being varied, affecting the food selection among adults. (Noraida et al., 2018). In Malaysia, around one in every two persons is classed as overweight or obese, and the incidence of overweight and obesity is expected to be at an all-time high in 2019. There is no reduction in the prevalence of overweight and obesity in Malaysia, yet the prevalence increases drastically from 2011 to 2019. In 2011, 21.4% and 15.1% of people were overweight or obese, respectively, while 30.0% and 17.7% of people were overweight or obese in

2015. The current survey conducted by the National Health and Morbidity Survey in 2019 found that the prevalence of overweight and obesity is 30.4% and 19.7%, respectively (National Health and Morbidity Survey, 2019).

The rising overweight and obesity problem in Malaysia reached an alarming level that will cause a considerable impact on the future and the upcoming generations. It causes the increasing prevalence of cardiovascular disease, diabetes and other severe health conditions (Ismail et al. 2002). Cardiovascular disease is the leading cause of death in Malaysia where treating and preventing obesity among the community would be effective to lower the risk of cardiovascular-related diseases, premature cardiovascular deaths, co-morbidities caused by obesity and associated health costs (Mariapun et. al., 2018).

Obesity and overweight are on the rise as a result of our contemporary way of life, which includes an excessive intake of energy-dense meals. The lack of nutrition knowledge and awareness within the community is the primary reason of the changes in eating patterns (Amin et. al, 2015). Poor interpretation of nutrition knowledge and awareness is a big issue associated with applying nutrition knowledge in daily life. (Ekeagwu, O. A., 2017).

1.2 Problem Statement

Overweight and obesity are among the rising and overwhelming health-related challenges in Malaysia that require community attention to address (NHMS 2019). The prevalence of overweight and obesity increases from 30.0% and 17.1%, respectively, in 2014 to 30.4% and 19.7% in 2019. Collectively, with overweight and obesity prevalence of 50.1% and will continue rising if no intervention is introduced to reduce

the prevalence of overweight and obesity. (NHMS, 2019). According to Ismail et al. (2002), the rising prevalence of overweight and obesity is due to the alteration of the typical diet and food intake of Malaysian adults in which the increases in the intake of energy, fat and sugar while reduced in the intake of fruits and vegetables. These developments are claimed to occur as Malaysia accelerates its urbanisation and industrialization to be recognised as a developed country.

Previous study has been conducted extensively in foreign countries, primarily the United States.This study was mostly conducted among Americans since they have a high prevalence of people with obesity BMI and an unhealthy eating pattern and behaviours that lead to several noncommunicable diseases (NCD) (Shakkour, 2007). Several studies have been conducted in Malaysia due to an increase in prevalence of overweight and obesity, but research on associations between sociodemographic profiles, nutrition knowledge, attitude, and practises on healthy eating with body weight status in Malaysia is quite scarce. Most research on associations between sociodemographic profiles, nutrition knowledge, attitude, and practices on healthy eating with body weight status in Malaysia is limited to a specific age group, most notably adolescents (Shaziman et al., 2017) and athletes (Ozdogan & Ozcelik, 2011), with limited research for the adults age group conducted.

It is critical to do research on nutrition knowledge since it is feasible to influence the body weight status of adults by undertaking this research. Not only that, the level of nutrition knowledge significantly enhances the nutrition attitudes and practice among the adults, so knowing the nutrition knowledge among the Malaysian adults helps in improving the nutrition attitude and practice among the Malaysian adults (Acheampong & Haldeman, 2013).

Thus, there is a need to understand the associations between socio-demographic factors, nutrition knowledge attitude and practice on healthy eating with body weight status among Malaysian Adults.

1.3 Research Questions

1. What are the socio-demographic factors, nutrition knowledge, attitude, practice on healthy eating among Malaysian adults?
2. What is the body weight status among Malaysian Adults?
3. Is there any association between nutrition knowledge, attitude, practice on healthy eating with body weight status among Malaysian Adults?

1.4 Research Objectives

1.4.1 General Objective

To determine the associations between socio-demographic factors, nutrition knowledge attitude and practice on healthy eating with body weight status among Malaysian Adults.

1.4.2 Specific Objectives

1. To determine the socio-demographic factors, nutrition knowledge, attitude, practice on healthy eating among Malaysian adults.
2. To determine the body weight status of Malaysian Adults.
3. To determine the associations between socio-demographic factors, nutrition knowledge attitude and practice on healthy eating with body weight status among Malaysian Adults.

1.5 Research Hypothesis

1. There are significant associations between socio-demographic factors, nutrition knowledge attitude and practice on healthy eating with body weight status among Malaysian Adults.

1.6 Conceptual Framework

Figure 1.1 shows the conceptual framework which shows the associations between socio-demographic profiles, nutrition knowledge, attitude and practices on healthy eating with body weight status among adults in Malaysia.

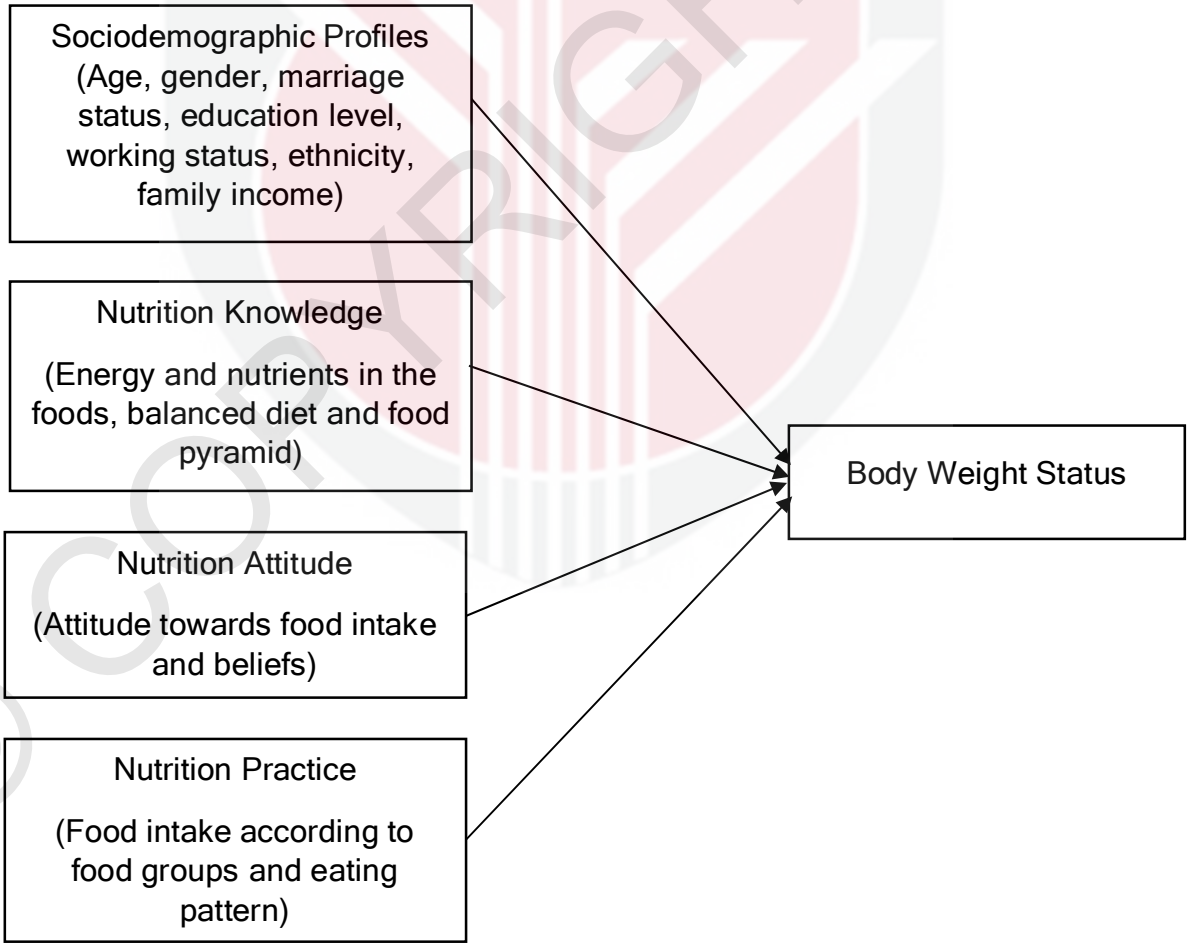

Figure 1.1: Conceptual Framework

1.7 Significance of Study

Currently, Malaysia has minimal information related to associations of sociodemographic factors, nutrition knowledge attitude and practice with body weight status among adults in Malaysia. The findings from this study may contribute to a baseline data for future study since a small amount of research has been carried out on nutrition knowledge, attitude, practices on healthy eating among adults and its associations with body weight status in both Malaysia and foreign countries.

Aside from that, doing this study contributes to the body of knowledge in the Malaysian community. It allows community members to put their nutrition knowledge, attitude, and practice to the test and get a better understanding of themselves.Knowing oneself raises one's awareness of the need of having adequate nutrition knowledge, attitude, and practise in order to decrease the occurrence of serious illness.

Having a strong understanding of the relationships between sociodemographic characteristics, nutrition knowledge, attitude, and practise, and body weight status among adults in Malaysia allows a specific party or organisation to educate on future nutrition intervention programme development.

CHAPTER 2: LITERATURE REVIEW

2.1 Prevalence of Overweight and Obesity

The prevalence of overweight and obesity is increasing dramatically as the year increases. The National Center for Health Statistics (2003) has reported that almost 65% of adults are overweight from the year 1999 – 2000. World Health Organization (2020) documented the rate of overweight and obesity has increased approximately threefold over the last four decades from 1975, indicating the importance of the concerns that should not be disregarded by the community. WHO (2020) stated that 39% of adults aged above 18 years old, about more than 1.9 billion adults, are overweight while 13% of adults also aged above 18 years old, which is about more than 560 million adults, are obese. Ramachandran and Snehalatha (2010) had predicted in their study that approximately 2-3 billion of adults will be overweight and more than 700 million will be obese in both developed and developing country in future if this issue is not well intervene.

This issue has reached an alarming level in Malaysia. The pattern of overweight and obesity can be seen continuing rising from year 2011 until 2019. NHMS (2019) recorded that the prevalence of overweight and obesity in 2011 were 29.4% and 15.1% respectively while the prevalence of overweight and obesity in 2015 were 30.0% and 17.7%. The prevalence of obesity and overweight in 2019 has reached about half of the Malaysian which is 50.1%, where 30.4% of Malaysians are overweight while 19.7% of Malaysians are obese. Even though the prevalence of obesity in the south-east Asian region is lower compared to the prevalence of obesity in Australia (26.4%), United Kingdom (26.9%), New Zealand (28.3%) and United States (33.3%) in the year 2008 but Malaysia has recorded the highest prevalence of

obesity in the year 2008 within the south-east Asian region with the prevalence of 14% followed by Thailand in the row with the prevalence of 8.8% (WHO, 2013). The rising of obesity causes other health risks such as type 2 diabetes, high blood pressure, coronary heart disease, stroke, gallbladder disease, respiratory problems, osteoarthritis, sleep apnea, and some types of cancer (Lin, 2005). The health risks that are very common in Malaysia are diabetes, hypertension and hypercholesterolemia. The prevalence of diabetes, hypertension, and hypercholesterolemia is 18.3%, 30.0%, and 38.1%, respectively. The trend of diabetes and hypercholesterolemia are seen to be rising from the year 2011 to 2015. The prevalence of diabetes increases from 11.2% in 2011 to 13.4% in 2015 while the prevalence of hypercholesterolemia increases from 35.0% in 2011 to 47.7% in 2015 (NHMS, 2019).

2.2 Factors associated with overweight and obesity

The rising prevalence of overweight and obesity pandemic is caused by several factors associated with the rising of these issues in Malaysia: socio-demographic factors, nutrition knowledge, attitude, and practice. Knowledge, attitude, and practice research refers to people's knowledge about the research being conducted (knowledge), their emotion, attachment, and desire for the issue (attitude), and their action and reaction, or what they generally do (practice) (Kaliyaperumal, 2004; WHO, 2008; Médecins du Monde, 2011; Chen, 2014). KAP research usually is conducted to set benchmark data in developing suitable and relevant interventions for a specific group of people. KAP research is also usually conducted to come out with the effectiveness of the research conducted. Research regarding nutrition KAP has also

started to be conducted in Malaysia but towards several age groups, mainly children and adolescents (Chen, 2014).

2.2.1 Socio-Demographic Factors

Sociodemographic factors can be critical to look at each aspect in detail. Socio-demographic factors include age, sex, education, migration background and ethnicity, religious affiliation, marital status, household, employment, and income. Socio-demographic factors are a good indicator of looking over the fundamental factors and providing an overview of the research conducted (Leibniz Institute for the Social Science, n.d.).

NHMS (2019) has stated that overweight and obesity are more common among females with 54.7% than males. The Indian ethnicity recorded the highest prevalence of overweight and obesity at more than 60% compared to other ethnicities. Around 61% of overweight and obese adults with the majority prevalence comes from 55 – 59 years old (NHMS, 2019).

Based on the National Nutrition and Healthy Survey in Taiwan from 1993 to 1996, Ramachandran and Snehalatha (2010) found that the prevalence of obesity and overweight is higher in men, with a prevalence of 20.3%, than in women, with a prevalence of 13.2%. Ramachandran and Snehalatha (2010) have also refuted the fact in the earlier sentence with the evidence that overweight and obesity is more significant among women in most of the other countries.

Obesity is more common among women than it is among men, with Indian and Malay women having the highest prevalence of obesity among women. The prevalence of obesity among Chinese men is more significant

among the prevalence of obesity in males. Overall, Malay ethnicity recorded the highest prevalence of overweight and obese compared to other ethnicities (Ismail et al., 2002). It has been strongly proven that overweight and obesity is more significant among married females (Aranceta et al., 2001).

2.2.2 Nutrition Knowledge

The vast amount of information available on medical health and nutrition has an impact on people's nutritional knowledge.There are some studies proven that nutrition knowledge significantly improved the pattern of food selection among the community. However, several have different opinions regarding nutrition knowledge where they stated that nutrition knowledge is not entirely efficient in enhancing the food selection pattern among the community (Shakkour, 2007). Nutrition knowledge is crucial as it indirectly helps to enhance the nutrition attitude among the community (Frazao & Allshouse 2003).

It was well documented that there is no relationship between nutrition knowledge and body weight status which is also known as body mass index (BMI). The researchers come out with this statement as they found that people with both obese and normal BMI have equal nutrition knowledge. They also added that there might be other aspects that influence body weight status, resulting in more people being overweight and obese. The equal nutrition knowledge among people with obese and normal BMI might be due to the concern of the obese people about their body and curiosity about healthy eating among normal people lead them to search and learn many things regarding nutrition knowledge (O'brien and Davies, 2007).

However, there was an inverse correlation recorded between nutrition knowledge and body weight status where it was indicating that the higher the nutrition knowledge, the lower the body weight status of the participants (Akkkartal & Gezer, 2019).

2.2.3 Nutrition Attitude

The next factor that has been observed to be contributing to the rise in overweight and obesity is nutrition attitude, also known as eating behaviour. Nutrition behaviour was categorized as a poor predictor of overweight and obesity because it has been said that they are contradict to one another. It has also been demonstrated that as the globe develops, people's attitudes toward nutrition are deteriorating and becoming more unfavourable, resulting in a higher proportion of overweight and obese people (Balani et. al, 2019).

Previous research found that there was no correlation between nutrition knowledge and body weight status (Faber & Kruger, 2005). Another previous study reported consistent findings that showed similar trends where nutrition knowledge does not correlate with body weight status, and added that nutrition attitude may not be a helpful predictor in determining body weight status. In order to tackle this issue, they had suggested that nutrition knowledge must be closely correlated in order to use nutrition attitude as a good predictor in determining body weight status (Dissen et. al., 2011).

Food preferences has been stated as one of the confounding variables that influence the nutrition attitude among community after investigating the relationship between nutrition attitude and body weight status. This might be because the flavour of food consumed before being ill is frequently hated,

although flavours related to positive results, such as a regular supply of energy, tend to become more enjoyed. This is possibly the source of the influence of 'familiarity,' in which foods were previously consumed and whose effects proved desirable (Wardle, 2007).

2.2.4 Nutrition Practice

Frequency of food intake was strongly predicted as a poor tool in assessing body weight status as it does not correlate with the body weight status (Tago et. al., 2004). Likewise, Kulovitz et. al. (2014) obtained the same pattern in their findings and had stated that there was no correlation between the frequency of food intake according to food group and body weight status where the number of days of food intake does not significantly influence the BMI of their participants.

Confectionery intake among adults contributes to an increase in the prevalence of overweight and obesity since they are correlated. Confectionery consumption has been identified as a factor contributing to a rise in body weight status due to its high sugar, energy, and low fibre content. However, the association was not well established because of certain bias discovered where confectionery contains vital nutrients that are required to be ingested in daily lifestyle that provide energy to individuals, which is carbohydrate. It is also linked to sugar consumption, since it has been demonstrated that the high rate of obesity among Americans is a result of their population's excessive sugar consumption (Ramachandran & Snehalatha, 2010). The daily nutritional intake of Americans has been linked to a rise in obesity and overweight rates in the United States, resulting in the United States having the highest prevalence of overweight and obesity in the world, which has been a constant source of

concern among health care providers. The Americans' typical diet comprises high sugar consumption while low in fruits and vegetable consumption. (Shakkour, 2007). The statement is closely related to research conducted in Korea that found westernization that is widely influenced among Korean people has led to the increasing of sugar uptake in their daily life where it causes a high number of Korean people presented with overweight and obesity (Ha et. al, 2016).

Local research conducted by Noraida et al. (2018) has strongly documented the sugar consumption trend in Malaysia with the reference of Malaysian Adults National Survey 2003 where Malaysian adults consumed approximately four tablespoons of sugar every day with the prevalence of sugar intake are high which is 55.9% which has also been influenced by western eating pattern. The finding was further supported by NHMS (2019) reported that Malaysian Adults are more likely to consume high sugary drinks. About 53.2% of adults consumed self-prepared drinks every day which contributes approximately about three tablespoons of sugar every day, about 4.2% of adults consume carbonated drinks and non-carbonated drinks which contribute approximately about six tablespoons of sugar every day and around 6.7% of adults consume premix drinks which contribute approximately about 3 tablespoons of sugar every day.

Naja et. al. (2011) has reported in their research that when fruits and vegetables ingested in large amount, it will alter and reduce the body weight status towards normal BMI classification where it shows they are inverse correlation found between them. A meta-analysis study carried out by Alinia et. al (2009) concluded that serving size of fruits and vegetables and body

weight status are inversely associated to one another proven by analysing 11 from 16 studies. The remaining 5 studies favour the result of no association between serving size of fruits and vegetables and body weight status.

Serving size of plain water intake does not influence and contributes to the increasing pattern of overweight and obesity where they are not associated to one another. There is also no sufficient evidence to further prove the association due to the less research focused on the association of plain water intake and has no crucial needs to be conducted on a larger scale (Salari-Moghaddam et. al., 2020). Park et. al (2012) has also stated in their study that serving size of water does not influence the body weight status but had clarified that people with higher BMI tend to drink more plain water because they get thirsty easily.

A cross-sectional study carried out by Huang (2010) recorded that skipping breakfast is one of the significant factors that lead to the rising of overweight and obesity prevalence. It has also been said that skipping meals, mainly breakfast, can cause weight gain among people. This research found that the meal pattern of skipping breakfast is common among people who are obese compared to people with normal BMI. This research is further supported with research by Blake et al. (2013) that improper meal patterns where people consume less than 3 meals per day related to the meal skipping, tend to have overweight and obese body weight status. This is due to an imbalance in energy consumption caused by meal skipping, which leads to weight gain. Ma et al. (2020) also demonstrated that skipping breakfast is inversely associated with body weight status.

CHAPTER 3: METHODOLOGY

3.1 Study Design

A cross-sectional study was carried out because this research was a population-based survey where the cross-sectional study design was the most appropriate. It was also low cost and did not require much time in completing the study.

3.2 Study Location

This study was conducted in Malaysia including both Peninsular Malaysia and East Malaysia. Peninsular Malaysia consists of 11 states and 2 federal territories. The states in Peninsular Malaysia are Selangor, Johor, Malacca, Negeri Sembilan, Perak, Pulau Pinang, Pahang, Perlis, Kedah, Kelantan and Terengganu. Kuala Lumpur is widely known as the capital of Peninsular Malaysia. East Malaysia consists of 2 largest states which are Sabah and Sarawak. These 2 states reside in the island of Borneo (Malaysian Wildlife, 2020).

3.3 Sample Size Determination

The sample size determination for this study was calculated by using the Hulley, Cummings, Browner, Grady, & Newman (2013) formula as below:

$$N = [\frac{(Z_\alpha + Z_\beta)}{c}]^2 + 3$$

$$c = 0.5\ x\ ln\ ln\ [\frac{1+r}{1-r}]$$

Z_α = the standard normal deviate for α = 1.96

Z_β = the standard normal deviate for β = 0.84

r = the expected correlation coefficient

Table 3.1 Sample size determination using correlation sample size formula

Factors	Correlation, r	Sample size, n
Nutrition knowledge associated with body weight status	r = 0.21 (Cooke & Papadaki, 2014)	$c = 0.5\ x\ ln\ ln\ [\frac{(1+0.50)}{(1-0.50)}]$ = 0.21 $N = [\frac{(1.96+0.84)}{0.55}]^2 + 3$ = 180.7 ≈181
Nutrition attitude associated with body weight status	r = 0.37 (szabo et al., 2019)	$c = 0.5\ x\ ln\ ln\ [\frac{(1+0.50)}{(1-0.50)}]$ = 0.39 $N = [\frac{(1.96+0.84)}{0.55}]^2 + 3$ = 54.5 ≈ 55
Nutrition practices associated with body weight status	r = 0.30 (Shaziman, 2017)	$c = 0.5\ x\ ln\ ln\ [\frac{(1+0.50)}{(1-0.50)}]$ = 0.30 $N = [\frac{(1.96+0.84)}{0.55}]^2 + 3$ = 90.1 ≈ 90

The highest number of sample sizes was chosen from the above table which was 181 participants. The sample size was being counted into the dropout rate of 10% which was 18 participants. The largest sample size was added with the 10% drop out rate as calculated using the dropout formula. Hence, the total sample size for the study was 199 participants, which was rounded off to 200 participants.

3.4 Research Participants

The participants that were involved in this study were the adults who meet the exclusion and inclusion criteria as below.

3.4.1 Inclusion Criteria

The adults that were involved in this study were Malaysian with a combination of all races and ethnicities in Malaysia. The participants consisted of both males and females with their age was in the range of 18-64 years old.

3.4.2 Exclusion Criteria

Individuals aged below 18 years old were not eligible to take part in this research. Pregnant women, postpartum women and lactating women were also not eligible to participate in this research as it might alter the research result.

3.5 Sampling Design

For this study, a non-probability sampling method called snowball sampling was used to find and collect the primary data from the participants. Generally, snowball sampling was defined as research participants recruit other participants for a test or study. It is usually used where potential participants are hard to find (Statisticshowto,

2014). Snowball sampling is a convenience sampling method. This method required the subject to recruit other people and the recruited people required to recruit other people. The process will become larger as the subject recruited other people. The Snowball sampling method was selected for this study because it was difficult to find participants that meet all the inclusion and exclusion criteria due to the covid-19 pandemic issue where it restricted our movement to personally meet and find the participants. Thus, the alternative method was used to collect the data where an online questionnaire was distributed to the participants using google form. The online questionnaire was distributed through social media platforms such as Whatsapp, Instagram and Facebook.

3.6 Study Instruments

The study instrument for this study was a self-administered questionnaire in which the questionnaire was presented to the participant in the Malay language. There were five sections required to be answered in the questionnaires where Section A was the socio-demographic profiles, Section B was the anthropometric measurements, Section C was the questions related to nutrition knowledge on healthy eating, Section D was the questions related to nutrition attitude on healthy eating and Section E was the questions related to nutrition practice on healthy eating.

3.6.1 Socio-Demographic Factors

The socio-Demographic factors questions consisted of 8 questions including age, gender, ethnicity, religion, marital status, level of education, working status and family income.

3.6.2 Anthropometric Measurements

There were two questions asked for this section which were weight and height. The weight and height of the participant were self-reported by the participants themselves. The weight and height were based on their memory of their latest weight and height. The BMI for each participant was calculated based on the reported weight and height using the BMI calculation formula, weight (kg) divided with height (m) x height (m). The BMI classifications were used based on the Asian cut-off that has been developed by the World Health Organization in 2000. The cut off classification for underweight is BMI <18.5 kg/m^2, for normal is BMI 18.5 kg/m^2 – 22.9 kg/m^2, for overweight is BMI 23.0 kg/m^2 – 24.9 kg/m^2 and for obese is BMI >25.0 kg/m^2.

3.6.3 Nutrition Knowledge on Healthy Eating

The nutrition knowledge on healthy eating questions was more to test the basic nutritional knowledge of the participants where it contained questions about carbohydrate, protein, fat, fruit and vegetable, vitamins and food pyramid. There were 19 questions asked in this section with five answer choices. For questions, 1 – 15 participants were required to choose one correct answer from the four answer choices or the participants choose the fifth answer choice 'Tidak pasti' that indicated that the participants were not sure of the answer for the questions asked. For the 16^{th} question, the answer choices were only 2, which were 'Ya' indicating yes while 'Tidak' indicating no. For the participant who answered 'Ya', they were required to answer further questions 16 – 19 while for the participants who answered 'Tidak', the further questions to be

asked were skipped and the participants were automatically redirected to the next section questions. Participants who answered correctly obtained one mark while participants who answered the wrong answer and 'not sure' choice obtained 0 marks. The minimum score for this section was 0, while the maximum score for this section was 19. Participants who scored 0 – 9 marks were classified into 'Poor Nutrition Knowledge' while participants who scored 10 – 19 marks were classified into 'Good Nutrition Knowledge'. The questionnaire for nutrition knowledge was taken from a study conducted by Chen (2014).

3.6.4 Nutrition Attitude on Healthy Eating

The nutrition attitude on healthy eating questions was more to observe the adult's eating behaviour, eating approach and belief. There were total of 10 questions asked in this section with 5 answer choices which were '*sangat tidak setuju*', '*tidak setuju*', '*neutral*', '*setuju*' and '*sangat setuju*'. The answer choice of '*sangat tidak setuju*' indicates that the participant firmly opposed the statement while the answer '*sangat setuju*' indicates that the participant firmly supports and agrees with the statement. Participants that answered '*sangat tidak setuju*' obtained 1 mark, '*tidak setuju*' obtained 2 marks, '*neutral*' obtained 3 marks, '*setuju*' obtained 4 marks and '*sangat setuju*' obtained 5 marks. For some reverse statement questions, the marks obtained were vice versa from the other questions. The minimum score for this section were 10 marks while the maximum score or this section was 50 marks. Participants who obtained 10 - 34 marks were classified into 'Poor Nutrition Attitude' while 35 - 50 marks

were classified into 'Good Nutrition Knowledge'. The questionnaire for nutrition attitude were taken from a study conducted by Soon (2011).

3.6.5 Nutrition Practice on Healthy Eating

The nutrition practice on healthy eating questions was more to observe the food preferences, frequency of food consumption and meal pattern. There was total of 11 questions in this section. Questions 1 – 8 focused more on the food preferences and frequency of food consumption while questions 9 – 11 focused more on the meal pattern. Questions 1 – 8 consisted of 2 types of questions where the first question will be asked on a certain type of food and how many days that particular type of food is taken in one week. The next type question will be how many serving of the particular type of food is taken. Questions 9 – 11 comprises questions of meal pattern in a week. The questionnaire for nutrition attitude was taken from a study conducted by National Health and Morbidity Survey (NHMS) 2014: Malaysian Adult Nutrition Survey (MANS).

3.7 Pre – Testing

The pre-testing of the study was conducted prior to the research from 8th June 2021 – 15th June 2021. 10% of the participants from the sample size was recruited for the pre-testing. So, around 20 participants were required to answer the questionnaire for the pre-testing. The pre-test was conducted by using the snowball method, where the pre-testing questionnaire was distributed through social media. The pre-testing

was conducted to analyse the participants' understanding and the readability of the study instruments. The questions were improvised and reassessed after the pre-test.

3.8 Procedure

Firstly, ethical approval from the Ethics Committee for Research Involving Human Subjects in Universiti Putra Malaysia (JKEUPM) was obtained on 29th June 2021. After getting the ethical approval, the data collection procedure was carried out from 30th June 2021 – 7th July 2021 through online surveys. The questions in the questionnaires were transformed into the google form format and the google form link was spread through the social media platforms such as 'Whatsapp', 'Instagram', 'E-mail', 'Facebook' and many more. The google form link also was shared through family and friends, and asked them to spread it for a larger network. Lastly, the data collected were analysed to obtain the result of the research that was carried out.

3.9 Ethical Approval

Ethical approval for this study will be acquired from the Ethics Committee for Research Involving Human Subjects in Universiti Putra Malaysia (JKEUPM) before collecting the data.

3.10 Statistical Analysis

The data collected was analysed by using IBM SPSS statistics 26 with a significant level set at $p < 0.05$. All the variables test showed normal distribution in skewness test, Shapiro Wilk and Kolmogorov-Smirnov normality test. The univariate

data was analysed and presented through descriptive analysis by using frequency and percentage for categorical variables while mean and standard deviation for continuous variables. Chi-square test was used to determine the association between the two categorical variables which was between sociodemographic profiles (independent variable) with body weight status (dependent variable) while Pearson Correlation was used to determine the association between two continuous variables which was between nutrition knowledge, attitude, practices (independent variables) with body weight status (dependent variable).

CHAPTER 4: RESULT

The data collection was carried out for two weeks starting from 30th June 2021 until 13th July 2021 since it has reached the maximum number of participants, which are 200 respondents.

4.1 Socio-Demographic Profiles

Table 4.1 shows the sociodemographic profiles of the participants. The age range of the participants was between 18 – 59 years old with mean age of 24.14 ± 6.63. Majority of the participants were between the ages of 20 – 29 years old (80.0%), with a minority between the ages of 50 – 59 years old (1.5%). Most of the participants in this study were female (75.0%), Malays / Bumiputera (67.0%), followed by Indian (28.5%) and the remaining were Chinese (4.5%).

About 84.5% of the participants were single, 13.0% were married, and the remaining were either divorced / widowed. In terms of education level, majority of participants (79.5%) had completed their education up to the Tertiary level. In comparison, the minority had completed their education up to the Secondary level (20.5%). Most of the participants were students (67.0%), followed by those working in the private sector (18.5%), participants who were not working (6.0%), participants who were self-employed (5.0%) and participants working in government / semi-government sectors (3.5%). In terms of family income, 51.5% of the participants had family income in the B40 category, 29.5% had family income in the T20 category and 19.0% of the participants had family income of M40.

Table 4.1: Distributions of participants socio-demographic profiles

Characteristics	*n* (%)	Mean ± SD
Age (years)		24.14 ± 6.63
18 – 19	14 (7.0)	
20 – 29	160 (80.0)	
30 – 39	16 (8.0)	
40 – 49	7 (3.5)	
50 – 59	3 (1.5)	
Gender		
Male	50 (25.0)	
Female	150 (75.0)	
Races		
Malay / Bumiputera	134 (67.0)	
Chinese	9 (4.5)	
Indian	57 (28.5)	
Religion		
Muslim	162 (81.0)	
Non-muslim	38 (19.0)	
Marital Status		
Single	169 (84.5)	
Married	26 (13.0)	
Divorced / Widow	5 (2.5)	
Education Level		
Secondary	41 (20.5)	
Tertiary	159 (79.5)	
Working Status		
Not working	12 (6.0)	
Student	134 (67.0)	
Government / semi-government	7 (3.5)	
Private	37 (18.5)	
Self-employed	10 (5.0)	
Family Income		
B40	103 (51.5)	
M40	38 (19.0)	
T20	59 (29.5)	

4.2 Nutrition Knowledge

Table 4.2 shows the nutrition knowledge of the participants. The mean score of the nutrition knowledge was 10.88 ± 3.26, indicating that the participant's average score is approximately 11 marks. Majority of the participant had good nutrition knowledge (65%) where the participants scored more than nine marks or within 10 – 19 marks while a minority of the participants had poor nutrition knowledge where the participants scored less than and equal to 9 marks or within 0 – 9 marks.

Table 4.2: Distributions of participants nutrition knowledge

Characteristics	*n* (%)	Mean ± SD
Nutrition Knowledge		10.88 ± 3.26
≤ 9 (Poor knowledge)	70 (35.0)	
> 9 (Good knowledge)	130 (65.0)	

4.3 Nutrition Attitude

Table 4.3 indicates the profiles of nutrition attitude of the participants. The mean score of the nutrition attitude was 30.56 ± 4.78 which indicates that the average score obtained by the participant is approximately 31 marks. About 83.0% of the participants had a poor nutrition attitude where the participants scored less than 35 marks or within the range of 10 – 34 marks from the Likert scale questions while 17.0% of the participants had a good nutrition attitude where participants scored more than equivalent to 34 or within the range of 34 – 50 marks from the Likert scale questions.

Table 4.3: Distributions of participants nutrition attitude

Characteristics	*n* (%)	Mean ± SD
Nutrition Attitude		30.56 ± 4.78
< 35 (Poor attitude)	164 (83.0)	
≥ 35 (Good attitude)	34 (17.0)	

4.4 Nutrition Practice

4.4.1 Frequency of Food Intake according to Food Groups

Table 4.4 shows the frequency of food intake according to food groups which focused on how many days participants consumed specific type of food in a week. The mean for the frequency of confectionery intake in a week by the participants was 2.42 ± 1.73, indicating the participants consumed confectionary on an average of 2 days a week. In terms of fruit consumption, the mean for the frequency of fruit intake was 3.74 ± 1.93, indicating that participants consumed fruits approximately four days a week. The mean for the frequency of vegetable consumption which was 4.72 ± 2.16 where it indicates that participants consumed vegetables on an average of 5 days a week. Finally, the mean for the frequency of plain water intake was 6.71 ± 1.12 where it shows that participants consumed plain water approximately every day in a week.

Table 4.4: Mean ± SD of frequency of food intake according to food groups by participants

Frequency of Food Intake according to Food Group (Days)	Mean ± SD
Frequency of confectionary intake	2.42 ± 1.73
Frequency of fruit intake	3.74 ± 1.93
Frequency of vegetables intake	4.72 ± 2.16
Frequency of plain water intake	6.71 ± 1.12

4.4.2 Serving Size of Food Intake according to Food Group

Table 4.5 indicates the serving size of the food intake according to food group which focused on the number of serving usually taken by the participants if the participants consumed certain type of food mentioned in the frequency of food intake according to food group in previous table. The mean for the serving size of the confectionery intake were 1.79 ± 1.36 where it indicates that the usual serving size of confectionery consumed by the participants was in average of 2 serving size. In terms of fruit intake, the serving size consumed by the participants was 2.15 ± 1.44. This show that the usual serving size of fruits consumed by the participants was about two serving size. The mean for the serving size of vegetable intake, which was 2.38 ± 1.66. It indicates that participants usually consumed approximately two serving of vegetables. The mean for the plain water intake was 6.20 ± 2.93 where it shows the usual serving size consumption by the participants was around six servings.

Table 4.5: Mean ± SD of the serving size of food intake according to food group by participants

Serving Size of Food Intake according to Food Group	Mean ± SD
Serving size of confectionary intake	1.79 ± 1.36
Serving size of fruits intake	2.15 ± 1.44
Serving size of vegetables intake	2.38 ± 1.66
Serving size of plain water intake	6.20 ± 2.93

4.4.3 Number of Meal Intake according to Meal Time

Table 4.6 shows the number of meal intake according to the meal time which mainly focusing on the meal skipping practice among the participants in a week. The mean for the number of meals consumed for breakfast were 4.75 ± 2.19 where it indicates that participants usually consumed breakfast for about five days a week, with breakfast skipping was about two days. The mean for the number of meals consumed for lunch were 6.28 ± 1.31 where it shows that the participants usually consumed lunch for approximately six days in a week with the meal skipping during lunch were about one day. The mean for the number of meals consumed for dinner, which were 5.87 ± 1.64 indicating the regular consumption of the dinner was around six days in a week where the meal skipping for lunch was about 1 day.

Table 4.6: Mean ± SD of number of meal intake according to meal time by participants

Number of meal intake according to meal time (Days)	Mean ± SD
Number of Meal Consumed for Breakfast	4.75 ± 2.19
Number of Meal Consumed for Lunch	6.28 ± 1.31
Number of Meal Consumed for Dinner	5.87 ± 1.64

4.5 Body Weight Status

Table 4.7 shows the body weight status of the participants in this study. Based on table 4.7, the mean for the body weight status was 23.92 ± 6.12. It indicates that the average body weight status of the participants was 23.92 kg/m2, which fall in the overweight category. The majority of the participants were in the BMI category of overweight and obesity (46.0%), followed by normal BMI category (40.0%) and the remaining participants were in the underweight category (14.0%).

Table 4.7: Mean ± SD and distributions of participants according to body weight status

Characteristics	n (%)	Mean ± SD
Weight		63.00 ± 18.99
Height		161.76 ± 9.12
BMI		23.92 ± 6.12
Underweight	28 (14.0)	
Normal	80 (40.0)	
Overweight & Obesity	92 (46.0)	

4.6 Associations between Socio-demographic Profiles and Body Weight Status

Table 4.8 indicates the associations between socio-demographic profiles with body weight status. The body weight status was classified into two categories which are underweight and normal BMI and overweight and obesity.

No significant associations were found between races, religion, education level, and family income with body weight status. However, there were associations between age and body weight status ($\chi 2 = 9.519$, $p < 0.05$). Among the participants who were overweight and obesity, majority of them were young adults (78.9%) where minority of them were middle-age adults (21.1%). Participants from the young adults category were 18 – 29 while participants in the middle-age adults category were in the age range of 30 – 59.

According to the data collected, gender was significantly associated with body weight status ($\chi 2 = 6.061$, $p < 0.05$). Of participants who were overweight and obesity, most of them were female (66.7%) and the remaining of them were male (33.3%). Besides, there as a significant association between marital status and body weight status ($\chi 2 = 7.666$, $p < 0.05$). Among the overweight and obesity participants, 76.7% were single while 23.3% were married. The participants who were divorced/widow were included in the married category because they had gone through the married phase of life before becoming divorcee or widow. Working status was found significantly associated with body weight status ($\chi 2 = 6.077$, $p < 0.05$). 64.4% of participants were overweight and obesity with majority percentage found to be not working, including students, while 35.6% of the participants who were overweight and obesity found to be working, including participants who were working in government / semi-government sectors, private sectors and self-employed.

Table 4.8: Distribution of associations between Socio-demographic Profiles with Body Weight Status of participants

Variables	Body Weight Status		χ2	*p*-value
	Underweight & Normal BMI	Abnormal BMI (Overweight & Obese)		
Age (years)			9.519	0.002*
Young Adults	103(93.6)	71(78.9)		
Middle age Adults	7(6.4)	19(21.1)		
Gender			6.061	0.014*
Male	20(18.2)	30(33.3)		
Female	90(81.8)	60(66.7)		
Races			0.483	0.487
Malay / Bumiputera	76(69.1)	58(64.4)		
Non-Malay/Bumiputera	34(30.9)	32(35.6)		
Religion			0.001	0.971
Muslim	89(80.9)	73(81.1)		
Non-Muslim	21(19.1)	17(18.9)		
Marital Status			7.666	0.006*
Single	100(90.9)	69(76.7)		
Married	10(9.1)	21(23.3)		
Education Level			0.261	0.610
Secondary	24(21.8)	17(18.9)		
Tertiary	86(78.2)	73(81.8)		
Working Status			6.077	0.014*
Not working Student	88(80)	58(64.4)		
Working	22(20)	32(35.6)		
Family Income			2.485	0.289
B40	57(51.8)	46(51.1)		
M40	17(15.5)	21(23.3)		
T20	36(32.7)	23(25.6)		

*Association is significant at $p < 0.05$

4.7 Associations between Nutrition Knowledge and Body Weight Status

Table 4.9 shows the associations between nutrition knowledge with body weight status. The data from table 4.7 shows that there was no significant correlation between nutrition knowledge and body weight status with r = -0.077 and p = 0.279 where $p > 0.05$.

Table 4.9: Associations between nutrition knowledge and body weight status of participants

Variable	Mean ± SD	Body Weight Status	
		r	***p*-value**
Nutrition Knowledge	10.88 ± 3.26	-0.077	0.279

* Correlation is significant at p <0.05

4.8 Associations between Nutrition Attitude and Body Weight Status

Table 4.10 indicates the associations between nutrition attitude with body weight status. There were no significant correlation between nutrition attitude and body weight status with r = 0.093 and p = 0.331 where $p > 0.05$.

Table 4.10: Associations between nutrition attitude and body weight status of participants

Variable	Mean ± SD	Body Weight Status	
		r	***p*-value**
Nutrition Attitude	30.56 ± 4.78	0.093	0.331

* Correlation is significant at p <0.05

4.9 Associations between Nutrition Practice and Body Weight Status

Table 4.11 shows the associations between nutrition practice that comprises of frequency of food intake according to food groups, serving size of food intake according to food groups, number of meal intake according to meal time and body weight status.

There was no correlation between frequency of confectionery intake and body weight status with r = 0.076 and p = 0.288 where p > 0.05. There was also no correlation between frequency of fruit intake and body weight status with r = 0.091 and p = 0.288 where p > 0.05. Furthermore, no correlation was found between frequency of vegetables intake and body weight status with r = 0.033 and p = 0.641where p > 0.05. Frequency of plain water intake was not correlated with body weight status with r = 0.030 and p = 0.678 where p > 0.05. Thus, overall, there was no correlation between the frequency of meal intake according to food groups (days) and body weight status.

There were correlation between serving size of confectionery intake and serving size of plain water with body weight status (r = 0.154, p = 0.030 and r = 0.185, p = 0.009). No correlation was found between serving size of fruits intake and serving size of vegetables with body weight status (r = 0.063, p = 0.381 and r = -0.028, p = 0.699) .

No correlation were found between number of meals consumed for breakfast, lunch and dinner (r = -0.380 and p = 0.589, r = -0.078 and p = 0.272, r = -0.048, p = 0.50).

Table 4.11: Associations between nutrition practice and body weight status of participants

Variable	Mean ± SD	Body Weight Status	
		r	*p*-value
Frequency of Food Intake according to Food Group (Days)			
Frequency of confectionary intake	2.42 ± 1.73	0.076	0.288
Frequency of fruit intake	3.74 ± 1.93	0.091	0.201
Frequency of vegetables intake	4.72 ± 2.16	0.033	0.641
Frequency of plain water intake	6.71 ± 1.12	0.030	0.678
Serving Size of Food Intake according to Food Group			
Serving size of confectionary intake	1.79 ± 1.36	0.154	0.030
Serving size of fruits intake	2.15 ± 1.44	0.063	0.381
Serving size of vegetables intake	2.38 ± 1.66	-0.028	0.699
Serving size of plain water intake	6.20 ± 2.93	0.185	0.009
Number of meal intake according to meal time (Days)			
Number of Meal Consumed for Breakfast	4.75 ± 2.19	-0.380	0.589
Number of Meal Consumed for Lunch	6.28 ± 1.31	-0.078	0.272
Number of Meal Consumed for Dinner	5.87 ± 1.64	-0.048	0.501

* Correlation is significant at p <0.05

CHAPTER 5: DISCUSSION

5.1 Body Weight Status

In this study, almost half of the Malaysian adults aged 18 – 59 which was 46.0% of them were overweight and obese. It is comparable with a study conducted by NHMS (2019), which found that half of Malaysian adults, or 50.1%, were overweight and obese. The prevalence of overweight and obesity increased drastically from the year 2015 to 2019, where the prevalence of overweight and obesity increase from 47.7% in 2015 to 50.1% in 2019. The prevalence of obesity increased about 2.4% in 4 years, which placed Malaysiaat an alarming level (National Health of morbidity Survey, 2019). Malaysia has the highest prevalence of overweight and obesity in the South-East Asia region, which has exacerbated the problem. However, the rate of overweight and obesity in the South-East Asia region is still manageable compared to western countries (WHO 2013).

5.2 Associations between Socio-demographic Factors and Body Weight Status

Based on the data in table 4.6, there were significant positive associations found between age and body weight status where it indicates that as the age increases or when people grow older, their BMI reading will be higher, which is in the overweight and obesity category. This finding is consistent with research conducted by Sherina and Rampal (2009) show a higher prevalence of overweight and obesity as the age increases. According to a study conducted by Pell et al. (2016), overweight and obesity are more prevalent among middle-aged people than among younger adults.The various causes could be attributed to physical changes that occur in people as they get older. When a person gets older, their behavioural and physiological states alter, and their basal metabolic rate decreases, putting them at a higher risk of being

overweight or obese.However, the data collected was in favour of the young adults where the young adults group were more likely to develop overweight and obesity compared to the middle-age adults group. The findings of this study differ from the previous research, more likely due to the uneven distribution of participants' age during the data collection where majority of the participants were from the young adults with the evidence of mean age of the study conducted was 24.14 ± 6.63 showing the average participants' age is around 24 years old.

The data show that overweight and obesity are more common in females than in males, which is consistent with the NHMS (2019) finding that females are more prone to develop overweight and obesity. According to Ismail et al. (2002), females are more likely to be overweight or obese than males because males are more physically active and have a higher physical activity level than girls who are slightly inactive and have a lower physical activity level. Aside from that, the number of females who become pregnant and give birth to a premature foetus is another factor that contributes to the risk of overweight and obesity among females (Letamo, 2010).

there was a significant association between marital status and body weight status. This finding was comparable to Sherina and Rampal's (2009) study, which demonstrated a relationship between marital status and body weight status, with married people being more prone to develop overweight and obesity. A study conducted by Jeffery (2002) found that married couples were more likely to acquire weight due to various variables that encourage people to eat more food in their daily lives, such as the need to finish the food cooked to avoid wasting.Other possible explanations include pregnancy and child-rearing among married women, which produce hormonal imbalances, and lifestyle changes, such as increased time spent caring for children and family, which significantly reduces their participation in physical

activities (Rodolfo & Nayga, 2001). However, the findings of this study revealed that single people were more likely than married participants to develop overweight and obesity. This disparity may develop as a result of the research being conducted during the movement control order (MCO) period, which may influence the lifestyle of the single subjects.

Working adults were more likely to develop overweight and obesity because they tended to limit their activities and engagement. Thus, putting them to be more prone to avoid physical activities in their daily lives, causing them to be less fit, which leads to morbidity and mortality (Tunceli et. al., 2012). In contrast, this study demonstrates that students and non-working individuals are more likely to develop overweight and obesity than working participants. This can be explained by student and non-working participants are more likely to experience a sedentary lifestyle because they're usually spent most of their time with the leisure activities such as watching television, munching on snacks such as junk foods and etc (Khalaf et. al, 2015). Furthermore, the present pandemic scenario, which restricts people's mobility, may be another cause causing students and nonworking adults to spend more leisure time at home, as noted in the preceding phrase.

5.3 Associations between Nutrition Knowledge and Body Weight Status

There is no correlation between nutrition knowledge and body weight status which is consistent with a study by Bried and Davies (2006). It was reported that nutrition knowledge has no direct effect on body weight status because overweight and obese participants were concerned about their weight, prompting them to learn about healthy eating and educate themselves on nutrition to apply it in their daily lives.

However, it may not affect their body weight, which could be attributed to the challenges in adopting a new lifestyle (O'brien & Davies, 2007).The finding was also consistent with previous study conducted by Rose et al (2016). Nutrition knowledge does not play a role in improving body weight status since there are other factors that limit nutrition information's effectiveness in improving body weight status, which are dietary choices (Rose et. al, 2016). Akkartal and Gezer (2019) conducted a similar study to investigate the relationship between nutrition knowledge and body weight status.Nutrition knowledge and body weight status were found to have a negative association (Akkartal & Gezer, 2019). Holdswoth et al. (2006) proposed that educating the community on healthy eating while using a behaviour and motivational approach for a powerful nutrition awareness level will result in more significant improvement in body weight status.

5.4 Associations between Nutrition Attitude and Body Weight Status

Findings from this study indicated that nutrition attitude was not significantly associated with body weight status. which was consistent with previous studies (Faber & Kruger 2005; Dissen et al. 2011). Nutrition and wellness programmes including trainings and information intended were recommended to enhance individual's attitude regarding food and nutrition (Dissen et. Al. 2011). The researcher also noted that nutrition knowledge influenced nutrition attitude and proposed that nutrition education be performed that focuses on nutrition attitude as well as nutrition knowledge to make both aspects more indicative of body weight status (Dissen et al., 2011). Apart from nutrition attitude, another factor, eating self-regulation, influenced the correlation with body weight status. Eating self-regulation is the ability to control one's feeding attitude

in order to attain a balanced diet goal, especially in unusual circumstances. Poor eating self-control combined with a positive attitude toward nutrition leads to an increase in appetite and a poor eating pattern (Balani et. al., 2019).

5.5 Associations between Nutrition Practice and Body Weight Status

there were no correlation between frequency of meal intake according to food groups (days) and body weight status. This finding is similar to a study carried out by Tago et. al (2004) indicating no correlation found between frequency of food intake and body weight status. This research was further supported by another research conducted by Kulovitz et al. (2014) stated the number of days of food intake according to food groups does not contribute to the increasing prevalence of overweight and obesity. Hence, the researcher concluded that there is no correlation between the number of days of food intake and body weight status. Physical activities were another confounding factor that influenced the correlation. For example, people may consume foods more frequently and balance this by increasing their physical activity to burn off the foods they have consumed (Kulovitz et. al, 2014).

There was a correlation found between confectionery intake and body weight status, which is consistent with a study conducted by Ballali et al. (2013), who stated that confectionery is high in sugar and low in fibre, and that it is a high energy dense food that contributes to an increase in body weight status. However, the researcher stated that further research should be conducted to confirm the association because sugar is a source of carbohydrate, which is one of the key macronutrients required by the body and is part of a balanced diet. According to a study conducted by Ha et al. (2016), the rising incidence of overweight and obesity in Korea is affected by a higher

intake of sugary foods that adheres to Western eating habits and lifestyle.It is proven that high intake of sugary foods causes an increasing prevalence of overweight and obesity among the United States community (Ramachandran & Snehalatha, 2010). This evidence can be linked to Malaysian adults, who likewise follow a Western eating pattern with an average sugar intake of 4 tablespoons per day, and the prevalence of sugar intake among Malaysian adults is 55.9%, according to the Malaysian Adults National Survey 2003. (Noraida et. al., 2018). The sugar eating pattern has increased among Malaysian adults, as seen by data obtained by NHMS (2019), which showed that Malaysian people ingested 6 tablespoons of sugar per day.

The serving size of fruits and vegetables consumed is unrelated to body weight status. The study contradicts the findings of Naja et al. (2011), who found that serving size of fruits and vegetables intake is inversely correlated to body weight status, with greater consumption of fruits and vegetables lowering body weight status. Another study, conducted by Alinia et al. (2009), indicated that fruits and vegetables are inversely correlated with body weight status in 11 of 16 trials. Fruits and vegetables are high in fibre and energy density, which aids digestion and directly reduces body weight and body weight status. The same researcher also noted that balance 5 studies had demonstrated that serving size of fruits and vegetables intake is unrelated to body weight status, while there was no evidence that fruits and vegetables are associated to body weight status (Alinia et. al., 2009). The findings of my study differed from those of other studies in that the intake of fruits and vegetables has no effect on body weight. This could be due to a high or low intake of other food sources such as whole-dairy products and refined grains, which has indirectly reduced the efficiency of fruits and vegetables that have no effect on body weight status (Khalaf et. al., 2015).

This result was consistent with research conducted by Salari-Moghaddam et. al (2020) where stated that the serving size of plain water intake is correlated to the body weight status but there is limited research conducted regarding its correlation. However, another study conducted by Park et al (2012) contradicts the findings this study, claiming that there is no link between serving size of plain water intake and body weight status, but that people who are overweight or obese are more likely to consume more plain water due to their physical condition.

Meal skipping was not correlated with body weight status which contradicted with research conducted by Huang et. al. (2010) where the researcher found that meal skipping which can be seen more obvious of skipping breakfast is inversely correlated with body weight status. When a person skips breakfast, it will directly reduce energy expenditure and raise energy consumption, which causes shoot up of energy storage. Another study, conducted by Blake et al. (2013), found that meal skipping was linked to body weight status. This is supported by research showing that skipping breakfast has a negative correlation with body weight status, with persons who skip breakfast being more likely to be overweight or obese (Ma et. al, 2020). The fact that the results this study differed from those of earlier research papers could be due to the use of a reduced form of a questionnaire for meal skipping rather than a full one. The disparity in results could also be related to the present pandemic condition, in which people's eating habits have shifted.

CHAPTER 6: CONCLUSION

6.1 Conclusion

Almost half of Malaysian adults were overweight or obese, with overweight and obesity (46%) being more common among young adults, females, singles, and those who were not working or studying. The rising prevalence of overweight and obesity in Malaysia is not attributable to a shortage of nutrition understanding or attitude. As a result, nutrition knowledge and attitude were not an useful measure of the factors that contribute to the surge in overweight and obesity among Malaysian adults.

This study found a minor association between food intake serving size and body weight status, but no correlation between food intake frequency and number of meal times and body weight status. It reveals that the frequency of food intake and number of meal times with body weight status, as well as serving size of food intake, play a vital role in the rise of overweight and obesity among Malaysian adults.

In conclusion, nutrition knowledge and attitude are not a suggestable tools but have a potential to be a good tools in indicating the rising prevalence of overweight and obesity in Malaysia. So, further research can be carried out in finding the potential confounding factors that influence and affect the findings to ensure the accuracy of the data. Nutrition practice is a good approach for dietitians and other health care practitioners to identify potential factors that contribute to overweight and obesity in Malaysia and intervene in their occurrence. It is advised that a 24-hour diet recall be performed in order to improve the approach of nutrition practise among Malaysian adults in identifying the factors that lead to overweight and obesity.

6.2 Limitation

There are few limitations from this study that might affect the data collected which need to be highlighted. Firstly, a cross-sectional study was carried out in this study where it unable to determine the cause-and-effect relationship between independent variables which were sociodemographic profile, nutrition knowledge, attitude, practice and dependent variable which was body weight status.

Then, the data collected for the weight and height were self-reported by the participants themselves according to their memories on their latest weight and height. The data collected might be inaccurate and bias because the weight and height reported by the participants might not be their latest weight and height where they report their weight according to their memory which might not take into account the changes that occurred, such as weight gain and weight loss.

Next, the data collected on the nutrition pattern of the participants was not their usual eating pattern where their eating pattern was affected by situational changes that occurred which was the pandemic covid 19. Pandemic covid 19 had caused people to completely stay at home where everything was done at home including worker and learning due to the Movement Control Order (MCO) that the Malaysian government had announced. Therefore, some of the participants claimed and clarified that they eat more because of MCO.

Lastly, the eating pattern data of the participants was collected using the simplified version of questionnaire where the eating pattern might be underestimated because it failed to identify participant's detailed eating patterns.

6.3 Recommendation

They are few recommendations for the future researchers in enhancing the efficiency of the research in future. First and foremost, future researcher is recommended to measure participant's weight and height by themselves. This action helps in preventing bias and data inaccuracy during the data collection. This step is crucial to be because slight error in the data collected might affect the overall research.

Next, future researcher is also recommended to identify and consider the environmental factors that might influence the research and conduct the research according to the factors that had been identified. This is because environmental factors might indirectly affect the data collected where it might change the participants' lifestyle than the usual lifestyle.

Furthermore, future researcher can develop questionnaire to be spread to the participants in two languages which are Malay and English instead of one language. This could help to increase the understandability of the participants where they can read the questions according to their understandability.

Lastly, future researcher is recommended to perform 24-hour diet recall instead of the simplified diet recall to increase the accuracy of data collected for participants' eating patterns. Not only that, performing 24-hour diet recall could give a wide range of results where more aspects can be included and discussed which lead to more findings can be obtained and published for the reference of future researcher, healthcare staffs and community. However, implementation of this recommendation required a skilled interviewer with nutrition / dietetics background in probing detailed information from the participants.

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APPENDICES

Appendix A: JKEUPM Approval Letter

Ref. no: UPM/TNCPI/RMC/JKEUPM/1.4.18.2 (JKEUPM)

Date: 28 June 2021

Dear Prof./Dr./Mr./Ms.,

APPLICATION FOR JKEUPM ETHICAL CLEARANCE: APPROVED

With reference to the above, I am pleased to inform you that your application for ethical clearance for the research project entitled **'Associations Between Sociodemographic Profiles, Nutrition Knowledge Attitude and Practices on Healthy Eating with Body Weight Status among Adults in Malaysia'** has been approved.

Please note that the official letter of approval will be issued as soon as possible. However, the ethical clearance is considered effective from the date of this email, and you may now proceed with your research.

Kindly remind the ethical approval is required in the case of amendments/ changes to the study documents/ study sites/ study team.

Researchers should also complete a Study Final Report upon study completion. The form can be obtained from the Ethics Committee for Research Involving Human Subjects (JKEUPM) website (http://www.tncpi.upm.edu.my/faildokumen).

If you have any enquiries, please contact Ms. Nurulhasanah Ishak (03-97691605) or Ms. Nor Ellia Abd Ajis (03-97691244).

Note: Please use this reference number for any transaction.

- JKEUPM-2021-243

Thank you.

Yours faithfully,

Prof. Dr. Zamberi Sekawi

Chair

Ethics Committee for Research Involving Human Subjects

Universiti Putra Malaysia

Appendix B: Participation Information Sheet and Informed Consent Form (English)

JAWATANKUASA ETIKA UNIVERSITI UNTUK PENYELIDIKAN MELIBATKAN MANUSIA (JKEUPM)

UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG,

SELANGOR, MALAYSIA

FORM 2.4: RESPONDENT'S INFORMATION SHEET AND INFORMED CONSENT FORM

Please read the following information carefully and do not hesitate to discuss any questions you may have with the researcher.

1. STUDY TITLE :

Associations between Sociodemographic Profiles, Nutrition Knowledge Attitude and Practices on Healthy Eating with Body Weight Status among Adults in Malaysia.

2. INTRODUCTION:

You are invited to participate in a study. This online survey through electronic form has information to help to decide whether you wish or not to participate in this research study – please review it carefully. Research studies include only those who choose to take part – your participation is completely voluntary and you can stop at any time.

The purpose of this study is to examine the associations between socio-demographic factors, nutrition knowledge attitude and practice on healthy eating with body weight status among Malaysian Adults. This research is conducted to explore in details about this topic since there is very limited research has been carried out on this topic in Malaysia. This research provides baseline data for future study, contribute to the body of knowledge among the community in Malaysia and allow certain party or organization in future planning of any nutrition intervention programs. Information from these studies will be used by the investigator for academic purposes such as Bachelor Dissertation, conference proceedings, and journal articles.

3. WHAT WILL YOU HAVE TO DO?

If you agree to participate, you will be asked to complete the online survey electronic questionnaire. You need to know your latest weight and height. The questionnaire consists of 5 sections to be completed where the first section is the personal information, second section is the measurement of body weight and height, third section is the question on participant nutrition knowledge on energy, minerals, nutrient, balanced diet, food pyramid, forth section is the question on participant attitude towards their diet, last section is the question on participant food intake according to food groups and eating pattern in one week period. Your participation will take approximately 10 to 15 minutes.

4. WHO SHOULD NOT PARTICIPATE IN THE STUDY?

You should NOT participate in this study if you are: (a) individual aged below 18 years old, (b) pregnant women, women who exclusively breastfeed their baby who are less than 6 months (100% breast milk).

5. WHAT WILL BE THE BENEFITS OF THE STUDY:

TO YOU AS THE SUBJECT?

If you decide to participate in this study, there will be no direct benefit to you.

(b) TO THE INVESTIGATOR?

Your participation in this research will provide new information and findings related to associations between sociodemographic profiles, nutrition knowledge attitude and practices on healthy eating with body weight status among adults in Malaysia.

Information collected including your response during this study might be shared with other researchers or being used for future research studies. We will not obtain additional informed consent from you before sharing the de-identified data.

6. WHAT ARE THE POSSIBLE RISKS?

There are no risks or discomforts that are anticipated from your participation in the study.

7. WILL THE INFORMATION THAT YOU PROVIDE AND YOUR IDENTITY REMAIN CONFIDENTIAL?

Your participation, identity and information taken during conducting the research will remain confidential. The researcher guaranteed that all the given information and your identity will remain confidential even after the results are being published.

8. ADDITIONAL QUESTIONS DURING THE COURSE OF THE RESEARCH?

If you have other questions or concerns about the study, You can contact the researcher. Sharina Farhana binti Mohd Merah, 198250@student.upm.edu.my, Faculty of Medicine and Health Sciences; or supervisor of this study, Dr Zuriati Ibrahim, 03-97692464, zuriatiib@upm.edu.my.

Please initial here if you have read and understood the contents of this page_____

9. CONSENT

I …… Identity Card No. ……
address……
……hereby voluntarily agree to take part in the research stated above *(clinical /drug trial/video recording/ focus group/interview-based/ questionnaire-based).

I have been informed about the nature of the research in terms of methodology, possible adverse effects and complications (as written in the Respondent's Information Sheet). I understand that I have the right to withdraw from this research at any time without giving any reason whatsoever. I also understand that this study is confidential and all information provided with regard to my identity will remain private and confidential.

I* wish / do not wish to know the results related to my participation in the research

I agree/do not agree that the images/photos/video recordings/voice recordings related to me be used in any form of publication or presentation (if applicable)

* delete where necessary

Signature …… Signature ……

(Respondent) (Witness)

Date :…….. Name :……..

I/C No. :……..

I confirm that I have explained to the respondent the nature and purpose of the above-mentioned research.

Date …….. Signature ……

(Researcher)

Appendix C: Participation Information Sheet and Informed Consent Form (Malay)

JAWATANKUASA ETIKA UNIVERSITI UNTUK PENYELIDIKAN MELIBATKAN MANUSIA (JKEUPM)

UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG,

SELANGOR, MALAYSIA

BORANG 2.4: PENERANGAN DAN PERSETUJUAN RESPONDEN

Sila baca maklumat berikut dengan teliti. Sekiranya anda mempunyai sebarang pertanyaan, sila kemukakan kepada penyelidik.

1.TAJUK KAJIAN

Perkaitan antara profil sosiodemografi, Pengetahuan Sikap dan Amalan Pemakanan yang Sihat dengan Status Berat Badan dalam kalangan Orang Dewasa di Malaysia.

2. PENGENALAN

Anda dijemput untuk mengambil bahagian dalam kajian. Tinjauan secara dalam talian melalui borang elektronik ini mempunyai maklumat untuk membantu menentukan sama ada anda berminat atau tidak untuk mengambil bahagian dalam kajian ini - sila baca dengan teliti. Kajian penyelidikan hanya terdiri daripada mereka yang memilih untuk mengambil bahagian - penyertaan anda adalah secara sukarela dan anda boleh tarik diri pada bila-bila masa sahaja.

Tujuan kajian ini adalah untuk mengkaji perkaitan antara profil sosiodemografi, pengetahuan sikap dan amalan pemakanan yang sihat dengan status berat badan dalam kalangan orang dewasa di Malaysia. Penyelidikan ini dijalankan untuk meneroka secara terperinci mengenai topik ini kerana terdapat kajian sangat terhad telah dijalankan mengenai topik ini di Malaysia. Penyelidikan ini memberikan data asas untuk kajian masa hadapan, menyumbang kepada pengetahuan dalam kalangan masyarakat di Malaysia dan membenarkan pihak atau organisasi tertentu dalam merancang program intervensi pemakanan pada masa akan datang. Maklumat dari kajian ini akan digunakan oleh penyiasat untuk tujuan akademik seperti Disertasi Sarjana Muda, prosiding persidangan, dan artikel jurnal.

3. APAKAH YANG PERLU ANDA LAKUKAN?

Sekiranya anda bersetuju untuk mengambil bahagian, anda akan diminta untuk melengkapkan soal selidik elektronik. Anda perlu mengetahui berat badan dan tinggi anda yang terkini. Soal selidik ini mengandungi 5 bahagian yang perlu dilengkapkan di mana bahagian pertama adalah maklumat peribadi, bahagian kedua adalah pengukuran berat badan dan ketinggian, bahagian ketiga adalah soalan mengenai pengetahuan pemakanan peserta tentang tenaga, zat, nutrien, makanan seimbang, piramid makanan, bahagian keempat adalah soalan mengenai sikap peserta terhadap diet mereka, bahagian terakhir adalah soalan mengenai pengambilan makanan peserta mengikut kumpulan makanan dan corak pemakanan dalam tempoh masa seminggu. Penyertaan anda akan mengambil masa lebih kurang 10 hingga 15 minit.

4. SIAPA YANG TIDAK BOLEH MENYERTAI KAJIAN INI?

Anda TIDAK boleh mengambil bahagian dalam kajian ini jika anda: (a) individu berumur bawah 18 tahun, (b) Wanita yang sedang mengandung, wanita yang menyusukan bayi berumur kurang daripada 6 bulan secara eksklusif (100% susu ibu).

5. APAKAH FAEDAH MENYERTAI KAJIAN INI?

KEPADA ANDA SEBAGAI PESERTA?

Sekiranya anda memutuskan untuk mengambil bahagian dalam kajian ini, tidak akan ada faedah kepada anda.

KEPADA PENYELIDIK?

Penyertaan anda akan menyumbang kepada pengetahuan dan penemuan baru berkaitan dengan perkaitan antara profil sosiodemografi, pengetahuan sikap dan amalan pemakanan yang sihat dengan status berat badan dalam kalangan orang dewasa di Malaysia.

Maklumat yang dikumpulkan, termasuk respon anda semasa kajian ini, kemungkinan akan dikongsi dengan penyelidik lain atau digunakan untuk kajian penyelidikan di masa depan. Kami tidak akan mendapatkan persetujuan tambahan daripada anda sebelum berkongsi data yang tidak dikenal pasti.

6. ADAKAH IA BERISIKO?

Tidak ada risiko atau ketidakselesaan yang akan berlaku dari penyertaan anda dalam kajian ini.

7. ADAKAH MAKLUMAT DAN IDENTITI SAYA KEKAL RAHSIA?

Penyertaan, identiti dan maklumat yang diambil semasa menjalani penyelidikan akan dirahsiakan. Penyelidik menjamin bahawa segala maklumat yang anda beri dan identiti anda akan dirahsiakan walaupun setelah kajian diterbitkan.

8. SIAPA YANG SAYA PERLU HUBUNGI SEKIRANYA SAYA MEMPUNYAI SOALAN TAMBAHAN SEMASA MENGIKUTI PENYELIDIKAN INI?

Sekiranya anda mempunyai pertanyaan semasa menjalankan penyelidikan, sila hubungi penyelidik kajian ini, Sharina Farhana Binti Mohd Merah, 198250@student.upm.edu.my, Fakulti Perubatan dan Sains Kesihatan; atau penyelia kajian ini, Dr Zuriati Ibrahim, 03-97692464, zuriatiib@upm.edu.my

Sila tandatangan di sini sekiranya anda telah membaca dan memahami kandungan halaman ini

_____

9. PERSETUJUAN

Saya…… No Kad Pengenalan. ……
beralamat.....dengan ini bersetuju untuk mengambil bahagian secara sukarela dalam penyelidikan yang tersebut di atas *(kajian klinikal/percubaan ubat-ubatan/rakaman video/kumpulan sasaran/temuduga/ soal selidik).

Saya telah diberi penjelasan secara menyeluruh mengenai penyelidikan ini dari segi metodologi, risiko dan komplikasi (seperti tertulis pada Helaian Penerangan Responden). Saya memahami bahawa saya berhak menarik diri dari penyelidikan ini pada bila-bila masa tanpa memberi sebarang alasan.Saya juga memahami bahawa sebarang maklumat yang berkaitan identiti saya akan dirahsiakan.

Saya* berminat / tidak berminat untuk mengetahui keputusan kajian yang melibatkan saya.

I setuju/tidak bersetuju untuk imej/gambar/rakaman video/ rakaman suara digunakan dalam apa jua bentuk penerbitan atau pembentangan. (sekiranya berkaitan).

*potong yang tidak berkenaan

Tandatangan …… Tandatangan ……

(Responden) (Saksi)

Tarikh :…… Nama :……

No. K/P: ……

Saya mengesahkan bahawa saya telah menerangkan kepada responden ini sifat dan tujuan penyelidikan yang tersebut di atas.

Tarikh …… Tandatangan ……

(Penyelidik)

Appendix D: Questionnaire

Nombor Rujukan

FAKULTI PERUBATAN DAN SAINS KESIHATAN

JABATAN DIETETIK

BORANG SOAL SELIDIK

PERKAITAN ANTARA PROFIL SOSIODEMOGRAFI, PENGETAHUAN SIKAP DAN AMALAN PEMAKANAN YANG SIHAT DENGAN STATUS BERAT BADAN DALAM KALANGAN ORANG DEWASA DI MALAYSIA

Nama Penyelidik : Sharina Farhana Binti Mohd Merah

Nombor Matrik 198250

Nama Penyelia : Dr. Zuriati Ibrahim

PERKAITAN ANTARA PROFIL SOSIODEMOGRAFI, PENGETAHUAN SIKAP DAN AMALAN PEMAKANAN YANG SIHAT DENGAN STATUS BERAT BADAN DALAM KALANGAN ORANG DEWASA DI MALAYSIA

BAHAGIAN A: FAKTOR SOSIO-DEMOGRAFI

MAKLUMAT PERIBADI INDIVIDU

Isi ruangan dibawah dengan manandakan (✓). Pilih satu jawapan sahaja.

1.	Berapa umur anda?	( ) Tahun Genap
2.	Apakah jantina anda?	( ) Lelaki ( ) Perempuan
3.	Apakah bangsa anda?	( ) Melayu ( ) Cina ( ) India ( ) Bumiputera Sabah, ( ) Bumiputera Sarawak, ( ) Lain-lain, Sila nyatakan: .....
4.	Apakah agama anda ?	( ) Islam ( ) Kristian ( ) Hindu ( ) Buddha ( ) Lain-lain,

		Sila nyatakan: .....
5.	Apakah taraf perkahwinan anda?	( ) Bujang ( ) Berkahwin ( ) Berpisah / Bercerai ( ) Janda ( ) Balu / Duda
6.	Apakah tahap pendidikan tertinggi anda?	( ) Tidak bersekolah ( ) Ujian Pencapaian Sekolah Rendah (UPSR) ( ) Sijil Rendah Pelajaran (SRP/PMR) ( ) Sijil Pelajaran Malaysia (SPM) ( ) Tingkatan 6 / sijil / diploma ( ) Peringkat sarjana muda ( ) Peringkat sarjana ( ) Tamat pengajian peringkat kedoktoran (PhD) ( ) Lain-Lain, Sila nyatakan: .....
7.	Apakah status pekerjaan anda?	( ) Tidak Bekerja

		( ) Pelajar ( ) Pekerja kerajaan ( ) Pekerja separa kerajaan ( ) Pekerja swasta ( ) Bekerja sendiri ( ) Pesara ( ) Lain-lain, Sila nyatakan: .....
8.	Berapakah pendapatan keluarga anda?	( ) B40 ( ) M40 ( ) T20

BAHAGIAN B: UKURAN ANTHROPOMETRI

Isikan jawapan yang betul di ruangan yang disediakan.

1.	Berapakah berat badan anda yang terkini (kg)?	
2.	Berapakah tinggi anda (cm)?	

BAHAGIAN C: PENGETAHUAN PEMAKANAN

Bahagian ini mengandungi jumlah 19 soalan yang perlu dijawab.

Soalan-soalan dibawah adalah berkaitan dengan pengetahuan pemakanan anda mengenai tenaga, zat dan nutrient dalam pemakanan, makanan seimbang serta pyramid makanan.

Sila pilih satu jawapan yang PALING TEPAT bagi soalan-soalan berikut.

1.	Antara yang berikut, yang manakah menunjukkan **kumpulan zat makanan**? O Nasi putih, ayam goreng, dan sayur sawi O Biskut, susu rendah lemak dan protein O Keju, kalsium dan telur O Lemak, vitamin dan mineral O Tidak pasti
2.	Berikut merupakan sumber makanan tinggi **karbohidrat, KECUALI** O Ubi kentang O Oat O Telur O Minuman coklat O Tidak pasti
3.	Berikut merupakan sumber makanan tinggi **protein, KECUALI** O Kacang soya O Sayur sawi O Ayam O Ikan

	O Tidak pasti
4.	Antara yang berikut, makanan yang mengandungi **paling banyak lemak** ialah O Popiah basah O Capati O Roti canai O Kuih apam O Tidak pasti
5.	Apakah **dua jenis zat UTAMA** yang dibekalkan oleh buah-buahan dan sayur-sayuran? O Protein dan kalsium O Vitamin B dan zat besi O Vitamin A dan vitamin C O Vitamin D dan Vitamin E O Tidak pasti
6.	Antara yang berikut, makanan yang mengandungi **kalsium yang tinggi** ialah O Yogurt (tairu) O Roti gandum penuh

	O Buah betik O Ayam O Tidak pasti
7.	Antara yang berikut, kumpulan manakah yang mengandungi **zat besi yang tinggi**? O Roti putih dan mentega O Daging dan organ dalaman O Sayur kobis dan pisang O Susu rendah lemak dan ubi kentang O Tidak pasti
8.	.....ialah kumpulan makanan yang mengandungi **serat yang paling tinggi** O Buah jambu batu dan kacang merah O Roti gandum penuh dan ikan O Susu dan keju O Daging dan ayam O Tidak pasti
9.	Apakah fungsi utama **karbohidrat**? O Membina otot badan

	O Membekalkan tenaga O Meningkatkan daya ketahanan badan O Menghasilkan darah O Tidak pasti
10.	Pernyataan berikut merupakan fungsi **protein, KECUALI** O Membantu tumbesaran tubuh O Membaikpulih tisu badan O Membina otot badan O Menguatkan tulang O Tidak pasti
11.	Pernyataan berikut merupakan fungsi **Vitamin C, KECUALI** O Menguatkan sistem ketahanan badan melawan penyakit O Menyembuhkan luka badan O Memelihara kesihatan gusi O Memelihara kesihatan mata O Tidak pasti
12.	Antara yang berikut, yang manakah mengandungi **kalori (tenaga) yang paling tinggi**? O Air

	O Karbohidrat O Lemak O Protein O Tidak pasti
13.	Apakah yang dimaksudkan **pemakanan yang seimbang**? O Makan banyak nasi dan daging untuk tumbesaran badan O Kurangkan pengambilan minyak dan masakan berlemak O Makan makanan yang kaya karbohidrat, protein, vitamin dan serat O Makan makanan yang mengandungi semua zat dalam kuantiti yang disarankan O Tidak pasti
14.	Anda boleh mendapatkan semua zat makanan yang diperlukan dengan cara: O Makan dalam kuantiti makanan yang banyak O Makan banyak daging O Makan pelbagai jenis makanan O Makan makanan mahal O Tidak pasti

15.	Pengambilan kuantiti **garam** yang disarankan bagi seseorang dalam sehari ialah O 1 sudu teh O ½ sudu teh O 1 sudu makan O ½ sudu makan O Tidak pasti
16.	Adakah anda tahu tentang piramid makanan? O Ya O Tidak
Bagi soalan nombor 16, **Sekiranya anda menjawab "Ya", sila jawab soalan 17 - 19** **Sekiranya anda menjawab "Tidak", sila jawab soalan 19**	
17.	Mengikut piramid makanan, kumpulan makanan yang anda boleh **makan SECUKUPNYA** ialah O Daging, ikan, ayam O Susu dan hasil tenusu O Nasi, roti, bijirin dan ubi O Sayur dan buah

	O Tidak pasti
18.	Mengikut piramid makanan, kumpulan makanan yang anda boleh **makan BANYAK** ialah O Daging, ikan, ayam O Susu dan hasil tenusu O Nasi, roti, bijirin dan ubi O Sayur dan buah O Tidak pasti
19.	Mengikut piramid makanan, kumpulan makanan yang anda perlu makan **secara SEDERHANA** ialah O Daging, ikan, ayam O Lemak, minyak dan gula O Nasi, roti, bijirin dan ubi O Sayur dan buah O Tidak pasti
19.	Pengambilan kuantiti **garam** yang disarankan bagi seseorang dalam sehari ialah O 1 sudu teh O ½ sudu teh

	O 1 sudu makan O ½ sudu makan O Tidak pasti

BAHAGIAN D: TINGKAH LAKU PEMAKANAN

Bahagian ini mempunyai jumlah 10 soalan yang perlu dijawab.

Soalan-soalan dibawah adalah berkaitan dengan tingkah laku pemakanan anda. Anda perlu memilih satu pilihan jawapan bagi setiap soalan. Berikut merupakan pilihan jawapan bagi setiap soalan di bahagian ini:

1 – Sangat tidak setuju

2 – Tidak Setuju

3 – Neutral

4 – Setuju

5 – Sangat setuju

No.	Soalan	1 (Sangat tidak setuju)	2 (Tidak setuju)	3 (Neutral)	4 (Setuju)	5 (Sangat setuju)
1.	Saya lebih mengutamakan kandungan nutrien daripada kelazatan makanan.					

2.	Buah-buahan dan sayur-sayuran tidak berapa penting untuk mengurangkan berat badan saya.					
3.	Orang yang berat badan berlebihan tidak perlu mengambil berat tentang kuantiti pengambilan air kosong.					
4.	Saya yakin bahawa pemakanan yang sihat dapat mengurangkan berat badan saya.					
5.	Saya dapat mengurangkan pengambilan lemak dengan berhati-hati semasa memilih jenis makanan.					
6.	Saya rasa mudah untuk mengurangkan makanan yang berkalori tinggi untuk					

	mencegah obesiti (kelebihan berat badan).					
7.	Saya tidak perlu mengambil tahu tentang berat badan saya asalkan saya rasa diri saya adalah sihat.					
8.	Saya mengambil berat tentang kuantiti gula dalam makanan.					
9.	Saya lebih suka makan makanan yang masin					
10	Saya yakin bahawa penyakit jantung dan diabetes (kencing manis) dapat dicegah melalui pemakanan yang sihat.					

BAHAGIAN E: AMALAN PEMAKANAN

Bahagian ini mengandungi jumlah 11 soalan yang perlu dijawab.

Soalan-soalan dibawah adalah berkaitan dengan pengambilan pemakanan mengikut kumpulan makanan dan corak pemakanan dalam tempoh masa seminggu.

Sila pilih satu jawapan sahaja.

1.	Kebiasaannya dalam tempoh seminggu, berapa hari anda makan konfeksi (kuih tempatan, kek, aiskrim, ABC, agar – agar, dsb)? 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 Hari **JIKA JAWAPAN ANDA ADALAH '0', TERUS KE SOALAN NOMBOR 3**
2.	Biasanya pada hari anda makan konfeksi, berapa banyak hidangan yang diambil? _____**Bilangan hidangan**
3.	Kebiasaannya dalam seminggu. Berapa hari anda makan buah - buahan (pisang, betik, oren, epal, buah-buahan dalam tin, buah-buahan kering, dsb)? 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 Hari **JIKA JAWAPAN ANDA ADALAH '0', TERUS KE SOALAN NOMBOR 5**
4.	Biasanya pada hari anda makan buah-buahan, berapa banyak hidangan yang diambil? _____**Bilangan hidangan**
5.	Kebiasaan dalam masa seminggu, berapa hari anda makan sayur-sayuran/ulam-ulaman? 0 | 1 | 2 | 3 | 4 | 5 | 6 | 7 Hari

	JIKA JAWAPAN ANDA ADALAH '0', TERUS KE SOALAN NOMBOR 7
6.	Biasanya pada hari anda makansayur-sayuran, berapa banyak hidangan yang diambil? _____**Bilangan hidangan**
7.	Kebiasaannya dalam seminggu, berapa hari anda minum air kosong? 0 1 2 3 4 5 6 7 Hari **JIKA JAWAPAN ANDA ADALAH '0', TERUS KE SOALAN NOMBOR 9**
8.	Biasanya pada hari anda minum air kosong, berapa banyak hidangan yang diambil? _____**Bilangan hidangan**
	SILA JAWAB SEMUA SOALAN DIBAWAH
9.	Kebiasaannya dalam seminggu, berapa hari anda ambil sarapan? 0 1 2 3 4 5 6 7 Hari
10.	Kebiasaanya dalam seminggu, berapa hari anda makan tengah hari? 0 1 2 3 4 5 6 7 Hari
11.	Kebiasaanya dalam seminggu, berapa hari anda makan malam? 0 1 2 3 4 5 6 7 Hari

Appendix E: Turnitin Result