UNIVERSITI PUTRA MALAYSIA

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FACTORS ASSOCIATED WITH DIETARY QUALITY AMONG PREGNANT WOMEN IN SELANGOR

BY

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

This project entitled “Factors associated with dietary quality among pregnant women in Selangor” was prepared by Norfarzana Binti Mohd Noordin and submitted to the Faculty of Medicine and Health Sciences as a 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

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LIST OF ABBREVIATIONS

DQI-P	Dietary Quality Index Pregnancy
EDS	Edinburgh Depression Scale
FAO	Food and Agriculture Organization
FFQ	Food Frequency Questionnaire
HEI	Healthy Eating Index
KAP	Knowledge, Attitude and Practice
MDG	Malaysian Dietary Guideline
MHEI	Malaysian Healthy Eating Index
MSPSS	Multidimensional Scale of Perceived Social Support
NHB	Non-Hispanic Black
NHW	Non-Hispanic White
PSS	Perceived Stress Scale
RNI	Recommended Nutritional Intake
TWG-R	Technical Working Group on Research

Abstract

FACTORS ASSOCIATED WITH DIETARY QUALITY AMONG PREGNANT WOMEN IN SELANGOR

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The objective of this study was to determine the dietary quality and its associated factors among pregnant women. A total of 84 pregnant women in the third trimester living in Selangor were involved in this study. Respondents were approached through online platforms, specifically Facebook groups consisting of pregnant women. Knowledge, Attitude and Practice (KAP) questionnaire was used to measure nutrition knowledge whilst stress level was measured using Perceived Stress Scale (PSS), depression symptoms was measured using Edinburgh Depression Scale (EDS), social support was measured using Multidimensional Scale of Perceived Social Support (MSPSS) and dietary quality was measured using Food Frequency Questionnaire and Malaysian Healthy Eating Index (MHEI). Pearson Product Moment Correlation analysis was used to understand the correlation between sociodemographic factors, nutrition knowledge and psychosocial factors with dietary quality among pregnant women. Majority of the respondents were Malay (89.2%) with the mean age of 28.19 ± 5.27 years, obtained tertiary education (88.1%) and in B40 categories (63.0%). Majority of the respondents were having a moderate dietary quality (60.7%) and 23.8% of the respondents were having a low dietary quality. There was a significant association found between stress level (p=0.031), overall perceived social support (p=0.009), social support from family (p=0.015), friends (p=0.012) and partner (p=0.009) with the dietary quality of pregnant mother. In conclusion, more than half of the respondents in this study were having a moderate and poor dietary quality. Furthermore, psychosocial factors including stress level and social support were found to be associated with dietary quality among pregnant women, thus; it might be beneficial to consider these factors when planning and doing nutrition assessment and intervention for all healthcare professionals.

Abstrak

FAKTOR YANG MEMPENGARUHI DIET KUALITI DI KALANGAN IBU MENGANDUNG DI SELANGOR

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Objektif kajian ini adalah untuk mengkaji kualiti makanan dan faktor-faktor yang berkait dengannya di kalangan wanita hamil. Sebanyak 84 wanita hamil, yang sedang dalam trimester ketiga dan tinggal di Selangor terlibat dalam kajian ini. Responden dijemput untuk menyertai penyelidikan ini melalui kumpulan Facebook yang terdiri daripada wanita hamil. Soal selidik *Knowledge, Attitude and Practice Questionnaire* (KAP) digunakan untuk mengukur pengetahuan pemakanan sementara tahap tekanan diukur menggunakan *Perceived Stress Scale* (PSS), gejala kemurungan diukur menggunakan *Edinburgh Depression Scale* (EDS), sokongan sosial diukur menggunakan *Multidimensional Scale of Perceived Social Support* (MSPSS) dan kualiti makanan diukur dengan menggunakan *Food Frequency Questionnaire* (FFQ) dan *Malaysia Healthy Eating Index* (MHEI). Analisis *Pearson Product Moment Correlation* digunakan untuk memahami hubungan diantara faktor sosiodemografi, pengetahuan pemakanan dan faktor psikososial dengan kualiti makanan di kalangan wanita hamil. Majoriti responden adalah berbangsa Melayu (89.2%) dengan usia rata-rata 28.19 ± 5.27 tahun, memperoleh pendidikan peringkat ketiga (88.1%) dan dalam kategori B40 (63%). Sebilangan besar responden mempunyai kualiti makanan yang sederhana (60.7%) dan 23.8% responden mempunyai kualiti makanan yang rendah. Kajian ini mendapati bahawa terdapat hubungan yang signifikan diantara tahap stres (p=0.031), sokongan sosial secara keseluruhan (p=0.009), sokongan sosial dari keluarga (p=0.015), rakan (p=0.012) dan pasangan (p=0.009) dengan kualiti makanan ibu hamil. Kesimpulannya, lebih daripada separuh responden dalam kajian ini mempunyai kualiti makanan yang sederhana dan rendah. Tambahan pula, faktor psikososial termasuk tahap tekanan dan sokongan sosial didapati berkait dengan kualiti makanan di kalangan wanita hamil dan ianya disarankan untuk mempertimbangkan faktor-faktor ini semasa merancang dan melakukan penilaian dan intervensi pemakanan untuk semua profesional penjagaan kesihatan.

CHAPTER 1
INTRODUCTION

1.0 Introduction

1.1 Background

Pregnancy is defined as the progression and episodes of modifications that arise as a result of a developing embryo in women's organs and tissues. The whole process takes nine months, on average (Huffman, 2020). Pregnancy is considered as one of the crucial moments in a person's life as one wrong step could affect both mother and offspring's life. Dietary intake in the first three months is significant for the development and differentiation of different organs whilst dietary intake in the last six months is significant for growth and brain development. (Rifas-Shiman et al., 2006). Having a good dietary quality during pregnancy is a significant element that should be monitored constantly as poor dietary quality during pregnancy could greatly give an adverse outcome to both mother and baby in a short and long term. Dietary quality is defined as consuming a variety, balanced and healthy food to sustain energy and to ensure all the essential nutrients are adequate for a normal growth and a good health condition (International Atomic Energy Agency, 2016). Several studies have found that dietary quality among pregnant women is poor and need improvement particularly in vegetables food group (Cheng et al., 2009; Shamim et al., 2016) whilst some study found that more than half of pregnant women in their study meet the recommended dietary intake (Saaka et al., 2021).

1.2 Problem statements

The lifestyle of people in Malaysia has been greatly modified due to socio-economic advancement during recent decades. This situation has caused society to shift towards 'western' eating habits with high consumption of energy, fat and carbohydrate, skipping meals and dependence on fast food (Noor, 2002). Protein intake and the percentage of total energy surpassed the recommended range whilst the intake of vegetables, fruits, dairy and dairy products were inadequate when compared to the recommended number of servings (Lee & Muda, 2019). The same pattern can be observed among pregnant women. Several studies have found that although the majority of women are cognizant of the significance of a healthy diet during pregnancy, most of them are unable to abide by food and nutrient recommendations. Studies have shown that most pregnant women have an inadequate nutrient-dense food consumption, higher energy-dense food consumption and have fewer fruits and vegetable consumption (Sahoo & Panda, 2006; Wen et al., 2010). A study in Canada found that 65% of women do not meet the recommended servings of fruits, vegetables and grains during pregnancy (Fowles et al., 2012) whilst a study that was conducted in Malaysia found that pregnant women in Malaysia consume fewer fruits and vegetables when compared to Malaysia Dietary Guideline (Hamid et al., 2019). Having insufficient nutrient intake during pregnancy could cause malnutrition which can further lead to poor pregnancy outcomes, for instance; fetal growth failure, low birth weight, preterm birth, infant mortality and infant death (Abu-saad & Fraser, 2010; Gernand et al., 2016). Besides, mothers who has insufficient maternal nutrition uptake can bring about complications during pregnancy such as preeclampsia, gestational diabetes, macrosomia, dystocia, and elevated risk of caesarean section (Reyes et al., 2013; T et al., 2005). Despite the recommended nutritional intake (RNI) in Malaysia with the goal of improving the

nutritional quality and minimizing the risk of adverse pregnancy outcomes, an increase in the proportion of pregnant women with a weight above the healthy range was found (Malaysia Dietary Guideline, 2017).

Several factors have been found to be associated with dietary quality among pregnant women. It is suggested that women with better nutrition knowledge are more likely to meet the nutrient recommendation than women with poor nutrition knowledge (Spronk et al., 2014). Pregnant women with higher nutrition knowledge have less fast-food consumption, an increase of chicken and supplement consumption, higher fruits and vegetable consumption along with high cereal and unsaturated fat consumption (Manan et al., 2012). Although nutrition knowledge is well-known as one of the determinants of dietary quality, less studies have been done pertaining to this in Malaysia (Chong et al., 2019).

In addition, psychosocial factors such as stress level, depression and social support are also associated with maternal dietary quality. Evidence suggests that high stress levels during pregnancy can increase consumption of food high in sugar and fat, thus decreasing the maternal dietary quality (Lindsay et al., 2016). Furthermore, when compared between two categories, pregnant women with depression are more prone to eat energy dense food and poor nutrient food. Hence decreasing their overall dietary quality (Fowles, Murphey, et al., 2011). Pregnant women with good social support consume more vegetables and healthier food than pregnant women without social support. Support from partner and female family members is important to maintain good dietary quality during pregnancy (Fowles, Murphey, et al., 2011; Olander et al., 2012) Despite the importance of psychosocial factors on maternal dietary quality, few studies have been done to investigate the association between depression, stress level and social support with maternal dietary quality. Less studies have been done to measure the correlation between

psychosocial variables and dietary consumption among pregnant women in Malaysia (Hamid et al., 2019).

Research questions:

1. What is the dietary quality of pregnant women?
2. What is the association between nutrition knowledge and the dietary quality of pregnant women?
3. What is the association between psychosocial factors and dietary quality of pregnant women?

1.3 Significance of the study

The findings of this study helped to fill in the knowledge aperture about factors associated with diet quality during pregnancy. Most of the studies were done in western countries, thereby there was less info regarding factors associated with diet quality among pregnancy in the local context. Up to date, there was no research regarding maternal dietary intake in rural China (Cheng et al., 2009). Furthermore, this study can be used as a reference for upcoming studies related to diet quality among pregnant women.

This research was also helpful in serving as a guide to the health professional and policymakers when developing preventive measures and doing health programs. This study can give a pellucid guide and help to identify the factors associated with diet quality during pregnancy period to the health professional. Thus, the issues pertaining to diet quality among pregnant women can be tackled and focused on. Besides, these findings can surely aid health professionals particularly nutritionists and dietitians when making nutrition intervention.

The study can be a source of valuable information to society particularly pregnant women and women in childbearing age. This study contains up to date information that was more relevant to the local context.

1.4 Objectives

General Objective

To determine the association between socio-demographic background, nutrition knowledge and psychosocial factors (stress level, depression symptoms and social support) with dietary quality among pregnant women.

Specific Objectives

1. To determine the sociodemographic factors (age, ethnicity, education level and monthly household income) among pregnant women.
2. To determine the nutrition knowledge among pregnant women.
3. To determine the stress level, depression symptoms and social support of pregnant women.
4. To determine the dietary quality among pregnant women.
5. To determine the associations between socio-demographic background, nutrition knowledge and psychosocial factors with dietary quality among pregnant women.

1.5 Null Hypothesis

- There is no significant association between sociodemographic factors and dietary quality among pregnant women.

- There is no significant association between nutrition knowledge and dietary quality among pregnant women.
- There is no significant association between psychosocial factors and dietary quality among pregnant women

1.6 Conceptual framework

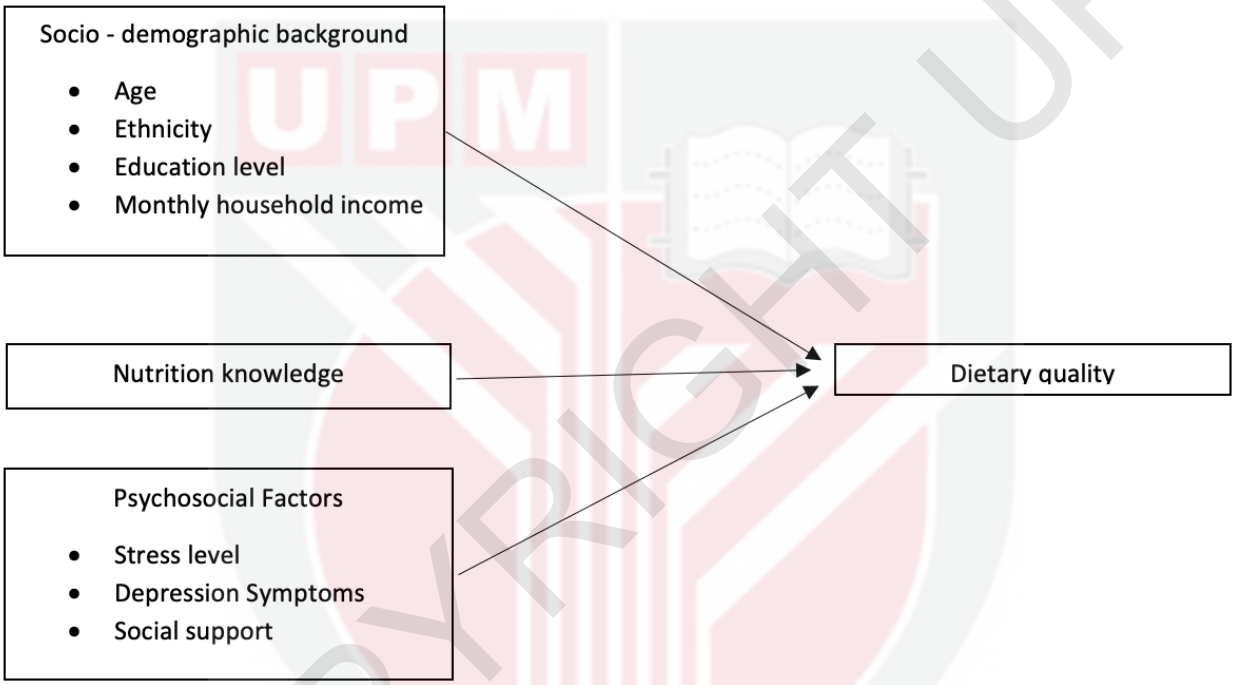

Figure 1 Conceptual framework

The independent variables in this study are sociodemographic background consist of age, ethnicity, education level and monthly household income, nutrition knowledge and psychosocial factors including stress level, depression symptoms and social support whilst the dependent variable in this study is dietary quality.

CHAPTER 2

LITERATURE REVIEW

2.0 Literature review

2.1 Dietary quality indices

The general definition of diet quality is an arrangement of foods into healthy and unhealthy foods. A person should consume a sufficient amount of healthy foods and nutrients along with a moderate amount of unhealthy food and nutrients (Guenther et al., 2013). Diet quality is increasingly being used in research as it acts as an indicator to determine the association between dietary consumption with nutritional status and health outcomes (Fransen & Ocke, 2008). There are different types of dietary quality indices that were being used to study the dietary quality among pregnant women and among them was Diet Diversity Score (DDS) and Healthy Eating Index (HEI). DDS has been widely accepted as a safe diet measuring instrument that is being used to measure diet quality and being present in dietary guidelines. It was given according to the 8 major food groups that are based on the Food and Agriculture Organization (FAO) guideline (Shamim et al., 2016). On the other hand, the Healthy Eating Index (HEI) was a tool that was commonly modified to achieve research objectives. Modified Healthy Eating Index for Malaysians (HEI) consists of nine elements in which the first seven elements evaluate maternal dietary compliance with the recommendation in MDG and the other two elements evaluate maternal dietary compliance with the suggested intake of fat from total energy and overall sodium intake in MDG (Yong, Shariff, Yusof, et al., 2019).

Several dietary indices can be used to measure dietary consumption among pregnant women such as dietary quality and dietary pattern, but both dietary indices serve a different purpose to the user. Diet quality is a scoring system that is used to measure and compare the dietary intake with the

recommendation whilst dietary pattern is derived from individual's food data with the purpose to study the pattern and combination of dietary intake (Livingstone & McNaughton, 2018). All in all, the dietary pattern is a good indicator to evaluate the overall pattern of dietary intake while dietary quality is a better indicator when it comes to evaluating the sufficiency of dietary intake.

Food Frequency Questionnaire (FFQ) is a type of tool that is used to collect dietary information of an individual or population, as a whole (National Cancer Institute, 2018). It served as an indicator of usual dietary consumption of an individual using long-term measure dietary recall techniques (Trumbo, 2021) and has been widely used in epidemiological research, whether it is cross sectional study or retrospective study. FFQ can be used to investigate dietary consumption or particular food consumption for the past months. Besides, it can be used to investigate the correlation between dietary consumption with health outcomes (International Dietary Data Expansion Project, 2018; National Cancer Institute, 2018). Many studies used FFQ to evaluate dietary quality of the population of different ages and there are several studies that used FFQ specifically to measure dietary quality of pregnant women. FFQ is a validated instrument that has a good acceptability in measuring food consumption at group level and most nutrient consumption at individual specific level (Zheng et al., 2020). It is concluded that FFQ is a validated tool that can be used to measure several nutrients consumption among pregnant women (Vioque et al., 2013).

2.2 Dietary quality among pregnant women

There were several studies that measured dietary quality among pregnant women in other countries as well as in Malaysia. In a cross-sectional study conducted in Canada, it was found that there were no significant differences in dietary quality scores among three groups of pregnant women (1st

trimester, 2nd trimester and 3rd trimester). However, the same study has found that the overall vegetables and fruits intake of the participants do not meet the recommended dietary guideline (Savard et al., 2019). In another study that was conducted among 716 pregnant women in Kenya, it was found that there was insufficient intake of food rich in folic acid, calcium, iron and zinc whilst the intake of food rich in protein, fat, carbohydrate, dietary fiber and vitamin A and C were sufficient and meet the dietary recommendation (Kamau-Mbuthia & Elmadfa, 2007). The same finding has been found in a cross-sectional study that has been conducted in Austin. The study found that 96% of the pregnant women in the study have an inadequate dietary intake and scored low in DQI-P with the intake of foods rich in folate and iron of the participants were much less than the recommended amount (Fowles et al., 2012). In another study that was conducted in Malaysia involving 78 pregnant women aged 20 to 45 years found that less than half of the participants have a good dietary quality and managed to meet the recommended intake. Only 40% of the participants meet the fat recommended intake whilst most of them meet the carbohydrates and fat recommended intake (Hamid et al., 2019). In another study that was conducted in Seremban, Malaysia found that the total mean dietary scores of the pregnant women in the first trimester and third trimester did not differ much (52.73 ± 0.52 and 52.76 ± 0.52 respectively) with a slight improvement can be observed in women at second trimester (57.10 ± 0.52) (Yong, Shariff, Mohd Yusof, et al., 2019).

All in all, it can be observed that the overall dietary quality of the respondents was low and most of the respondents in the studies do not meet the recommended dietary intake, with some studies show that the respondents have a lower intake of vegetables, fruits and food high in folic acid and calcium whilst some studies show that the respondents have a higher fat intake. When looking into differences of dietary quality between trimesters, there were no significant differences that can be

found between the first trimester, second trimester and third trimester. It is important to note that there were some studies that were conducted in Western countries and there were some conducted in Asia. Therefore, the findings of the study might differ from one to another due to several factors such as culture and climates. On top of that, the instruments used to measure dietary quality also differ from one another, and this might influence the findings.

2.3 Association between sociodemographic background and diet quality

Various socio-demographic backgrounds such as age, marital status, gender, education level, type of job and household income were found to be related to dietary quality (Darmon & Drewnowski, 2015). Generally, women are said to have a better dietary quality compared to men. In a cross-sectional study that was conducted in Cyprus, women were found to have a better dietary equality when compared to men ($p < 0.005$). Overall, 74.1% participants scored low in HEI-2005 in this study in which the rate of men (82.5%) was higher than women (71.2%) (Akkartal & Gezer, 2020). As for dietary quality among pregnant women, a study that was conducted in the United States has found that pregnant women who were older (95% CI [0.7-1.8]) and more educated (95% CI ⩾7.0-⩾3.5]) scored 2.6 points higher in the dietary quality scores compared to younger and less educated pregnant women. In addition, it is found that older participants have a better intake of vegetables, fibre, calcium, and folate along with a lower intake of trans fat when compared to younger participants. The study has also found that there was no correlation between ethnic groups and dietary quality as African American and white participants both had the same score for AHEI-P (95% CI [⩾0.2-2.8]) (Rifas-Shiman et al., 2009). This finding might be due to there being more white participants than African American participants in this study. Contradictory, a study that was conducted back in 2015 found that ethnicity was associated with dietary quality among pregnant women. The cohort study that involved 995 pregnant women in Singapore found that Malay

pregnant women were more likely to have poor dietary quality (OR=2.54, 95% CI [1.55-4.16]) compared to Chinese and Indian. The same study also found that being younger (OR = 0.94, 95% CI [0.90-0.97]), having secondary education or lower (OR = 1.96, 95% CI [1.19-3.25]) and having low household income (OR = 2.00, 95% CI [1.03- 3.87]) were found to be associated poor dietary quality as most of them have inadequate fruits, vegetables and dairy food consumption ($p<0.001$ for all) (Han et al., 2015).

In another cross-sectional study conducted by Parker et al. (2020) it was found that monthly household income and ethnicity were associated with dietary quality among pregnant women. Participants with high monthly household incomes scored higher in dietary quality along with a higher mean score for whole fruits, red and processed meat and trans-fat ($p<0.001$ for all) compared to middle and low income ($p=0.002$). It was also found that Non-Hispanic White (NHW) participants and Non-Hispanic Black (NHB) participants scored lower in AHEI-P compared to other races ($p=0.002$). Multivariate adjustment shows that NHW and NHB scored lower in vegetables ($p=0.002$), whole fruits, ($p=0.003$), iron ($p<0.005$) and folate ($p<0.001$) components along with higher scores for sugar sweetened beverages components ($p=0.002$). However, a study that was conducted in Greek found no association between age, education and income level with dietary quality ($p>0.005$ for all) among pregnant women (Tsigga et al., 2011). These findings might be due to differences in analyses used.

2.4 Association between nutrition knowledge and dietary quality

The general definition of nutrition knowledge is knowledge pertaining to the concept of nutrition and health which includes association between dietary intake and health, the macro and micronutrients of food, dietary recommendation and the knowledge of the food itself (Miller &

Cassady, 2015). It is found that nutrition knowledge is closely related to dietary quality as persons with low nutrition knowledge may be less aware and less comprehend the nutrition information, thus affecting their food choice and food consumption (Chong et al., 2019). Women in general are more likely to be knowledgeable on nutrition aspects when compared to men, this contrast is due to women's dominant role in buying and preparing foods or less attentiveness in nutrition by men (Spronk et al., 2014).

There is a strong association between nutrition knowledge and dietary quality. A study that was conducted in Indonesia has found that nutrition knowledge was positively correlated with dietary quality ($p<0.005$) (Dunneram & Jeewon, 2013). In another cross-sectional study that was conducted in 2020, it was found that women with lower nutrition knowledge have a lower dietary quality score ($p<0.005$) (Akkartal & Gezer, 2020). This is supported by a meta-analysis study that was conducted by Spronk et al. (2014). It was found that nutrition knowledge was positively associated with dietary quality ($r<0.05$). Many studies have found that nutrition knowledge was correlated with higher vegetables (n=11) and fruits (n=10) consumption along with lower fat consumption (n=7). In addition, a study that was conducted in Malaysia involving 222 women has found that having good nutrition knowledge was associated with a better dietary quality ($r=0.150$, $p<0.05$) particularly in vegetables and fruits consumption. Participants with higher nutrition knowledge were reported to have a better vegetable ($p<0.005$) and fruits ($p<0.001$) intake compared to those with lower nutrition knowledge (Chong et al., 2019). Moreover, a study that was aimed to assess the relationship between nutrition knowledge and dietary quality during pregnancy has found that nutrition knowledge was associated with dietary quality during pregnancy. This study has also found that nutrition knowledge was the only significant determinant

in dietary quality scores during the third trimester of pregnancy (β=0.26; p=0.017) (Savard et al., 2019).

2.5 Association between psychosocial factors and dietary quality among pregnant women

Psychosocial factors are interaction or psychological sensation that may influence an individual's social life and psychology. It includes different individual-level measurements and variables that may affect mental health (Coons et al., 2013). There are two different categories of psychosocial variables which are firstly, the mental status of the individual itself and secondly, factors that occur as a result of the surrounding environment such as social support (Singh-Manoux et al., 2003). There are different domains of psychological variables which include mood status, cognitive behavior and social life (Coons et al., 2013) and these psychosocial factors may affect food habits and food choices of an individual. Negative sentiments such as fear and stress are correlated with poor eating patterns and poor dietary quality (Grossniklaus et al., 2010). Women with higher perception of stress and depressive symptoms have a greater exposure to low dietary quality with a higher consumption of unhealthy food and low consumption of healthy food (Lindsay et al., 2017).

One of the factors that is associated with dietary quality among pregnant women is stress level. Psychosocial factors which include depression, stress level and low social support from partner and community are one of the important components in maternal dietary quality determinants as it can reduce the dietary quality of a person (Fowles et al., 2012). In a meta-analysis study that was conducted by Khaled et al. (2020) with the aim to measure the association between stress and dietary quality among women in childbearing age, three studies have found that stress level was significantly associated with dietary quality (Khaled et al., 2020). Moreover, all the studies found

that stress level was significantly correlated with greater fat intakes with only one study conducted by Hwang et al. (2010) found a contradictory finding. On top of that, it was also found that stress level was inversely correlated with fruits, vegetables and grains intakes ($p<0.02$) whilst fast food, sweets, snacks and energy drinks were found to be positively correlated with stress level ($P<0.05$). Nevertheless, these findings cannot be generalized for all pregnant women as women in these studies may have not experienced pregnancy hence the distress experienced were different from pregnant women.

A cross sectional study conducted in the United States involving low-income women in their first trimester found that stress level was strongly associated with overall dietary quality during pregnancy ($p<0.05$). Regression analysis shown that maternal distress was inversely correlated with dietary quality ($r=-0.32$) as pregnant women with low level of stress were found to score higher in Dietary Quality Index Pregnancy (DQI-P) and meet the minimum Institute of Medicine (IOM) requirement (Fowles, Murphey, et al., 2011). This study was supported by a meta-analysis study that was conducted by Baskin et al. (2015) as it was found that antenatal stress was negatively associated with good dietary quality and healthy eating pattern. Two cross sectional studies that were conducted in 2011 found that maternal distress was negatively associated with dietary quality during first trimester (ß=-0.21 and r=- 0.50 respectively) (Fowles, Bryant, et al., 2011; Fowles, Murphey, et al., 2011) whilst another study found that maternal distress was negatively associated with the fats, oils, sweet and snacks consumption during third trimester ($r=-0.18$) (Hurley et al., 2005). However, it is important to note that all the studies were conducted in western countries, thus it cannot be generalized to the local context. The same results were found in a study that was conducted among 173 pregnant women in California. Pearson correlation shows that stress levels during pregnancy were found to be negatively associated with full fat dairy intake (r=- 0.27,

$p<0.05$) and indirectly affected the total fat consumption (K. Lindsay et al., 2016). All in all, various studies have shown that stress level was negatively associated with dietary quality during pregnancy as the pregnant women have a higher consumption of unhealthy food such as high fat food.

Depression is said to be one of the factors that can strongly influence the dietary quality of an individual. In a pilot study that was conducted by Fowles et al. (2012) among 71 women has found that having depression symptom was significantly and negatively associated with dietary quality ($r=-0.41$, $p=0.002$) as women with depression symptom were found to have a dietary score below median ($n=35$). The same findings have been found in a cross-sectional study that was conducted in rural areas of Bangladesh. The study has found that women with higher depression symptoms were associated with lower dietary quality as they have lower dairy, eggs, fish, vitamin A-rich and vitamin C-rich food consumption (OR=1.80) (Sparling et al., 2020). Several studies that were conducted among pregnant women also found that depression symptoms were correlated with dietary quality. Pregnant women with depression symptoms were found to have two times odds of having poor dietary quality (OR=1.80, 95%CI[1.23 – 2.60]) compared to pregnant women without depression. This can be seen in the lower intake of whole fruits ($p<0.001$) and vegetables ($p<0.005$) along with higher intake of fats, sugar and alcohol ($p=001$) among depressed pregnant women (Avalos et al., 2020). The findings are consistent with a systematic review study that has been done in 2015. It was found that antenatal depression symptoms were positively associated with poor dietary quality. One cohort study found that having depression symptom was independently associated with dietary quality in women during third trimester of pregnancy ($p<0.05$) whilst two cross sectional studies found that antenatal depression symptoms was negatively associated with

dietary quality (r=-0.62 and p=0.001 respectively) along with higher fats, oil and sugar consumption (r=0.22, p<0.05) during 1-12 weeks of gestation (Baskin et al., 2015).

One of the factors that was associated with dietary quality was social support from family and friends. Pregnant women who lack family support were found to have poor dietary quality (p<0.005) compared to women who received family support (Nash et al., 2013). In a study that was conducted in 2011, it was found that partner support was associated with dietary quality as participants who received support from partner were found to have a higher intake of vegetable (r=0.54) and low intake of iron (r=-0.68) and grains (r=-0.67) (Fowles, Murphey, et al., 2011). In another cross-sectional study, it was found that pregnant women who received support from family were found to have a higher dietary score (52.0±12.0 vs 57.4±7.2) compared to those who receive less family support. However, the same study has found that support from partners was not significantly associated with antenatal dietary quality (r=0.20) (Fowles et al., 2012). The same finding has been found in a cross-sectional study that was conducted in 2011 whereas support from family was found to be associated with antenatal dietary quality (β=0.19) while support from partners was found to have insignificant association with antenatal dietary quality (β=0.03). As most of the participants were unmarried and living alone, this finding cannot be generalized to all pregnant women (Fowles, Bryant, et al., 2011)

CHAPTER 3

METHODOLOGY

3.0 Methodology

3.1 Study design

This was a cross-sectional study that investigated the association between socio-demographic factors, nutrition knowledge and psychosocial factors with the dietary quality among pregnant women.

3.2 Study location

This study was conducted by using an online platform and the respondents of this study were pregnant women that live in Selangor.

3.3 Sampling and subjects' selection

3.3.1 Respondents

The respondents of this study were pregnant women aged between 18 – 45 years old and at third trimester (week 27 – week 42 gestation). Third trimester was chosen as the targeted respondents in this study because the instrument used in this study which was Food Frequency Questionnaire (FFQ) can look into the dietary intake for past 12 months; hence, the overall dietary intake throughout pregnancy can be measured (Mitry et al., 2019).

3.3.2 Sampling method

This study was using a purposive sampling and the information on the study and questionnaires were disseminated through Facebook groups that consist of pregnant women. Pregnant women were free to fill in the questionnaire. The responses then were filtered to pregnant women that lived in Selangor and in the third trimester through purposive sampling.

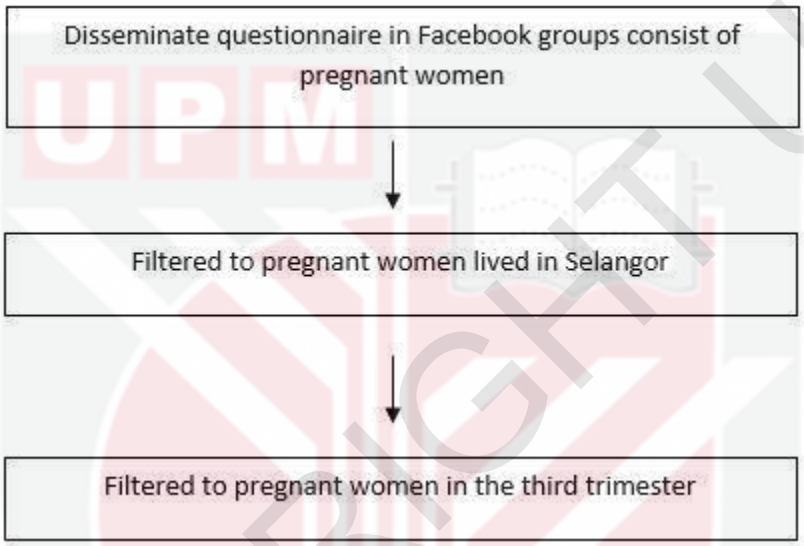

Figure 2 Sampling method

3.3.3 Selection criteria

The subjects of this study were pregnant women aged 18 – 45 years old and at 27 to 42 weeks of gestation. The inclusion and exclusion criteria were listed below:

- Inclusion criteria
    - Malaysia citizen
    - Aged 18 and above
    - 27 to 42 weeks of gestation
    - Pregnancy without any complications (such as: gestational diabetes and hypertension)

- Singleton

- Exclusion criteria
  - Do not understand Malay or English language
  - Illiterate pregnant women

3.3.4 Sample size determination

Formula by Hulley et al (2013) was used to test the hypothesis on the association between independent variables and dependent variable.

$C = 0.5^* \ln [(1+r) / (1-r)]$

$N = [(Z\alpha + Z\beta) / C]^2 + 3$

Where,

$\alpha = Z\alpha = 1.96$

$\beta = Z\beta = 0.84$

r = the expected correlation coefficient

As shown in Table 3.1, the sample size obtained from this study was 110. Additional 20% was added to sample size to cover for non- response or any other errors. Therefore, the total sample size was 132.

Table 3.1 Sample size determination

Correlation studies	Correlation, r	Sample size, n
Prenatal stress and anxiety is associated with lower dietary fat and dairy consumption among healthy pregnant women (Lindsay et al., 2016)	0.27	$C = 0.5^* \ln [(1 + 0.27) / (1 – 0.27)$ $= 0.28$ $N = [(Z\alpha + Z\beta) / C]^2 + 3$ $= 110$

3.4 Study instrument:

The self-administered questionnaire was used consisted of six sections: sociodemographic background, nutrition knowledge, stress level, depression symptoms, social support and food frequency questionnaire. This questionnaire was using the bilingual language of English and Malay.

3.4.1 Socio-demographic background

The socio-demographic factors include the questions regarding age, ethnicity, education level and monthly household income of the participants. Obstetric characteristics such as trimester and medical condition of the respondents were included as well.

3.4.2 Nutrition knowledge

This study was using the Knowledge, Attitude and Practice (KAP) questionnaire that has been developed by the Technical Working Group on Research (TWG-R). The questionnaire consists of 21 items for knowledge, 8 items for attitude and 12 items for assessing practice. As this study was only measuring the nutrition knowledge, the items for attitude and practice were not included in the questionnaire. There were five components of nutrition knowledge that were assessed which were nutrient function, energy of food, nutrient insufficiency, food selection and supplies of food. When calculating the score, 1 mark was given to the correct answer and 0 mark was given to an incorrect or unsure response. The total scores were computed and converted to percentage. Respondents with scores between 0% to 50% were categorized as having poor nutrition knowledge, 51% to 74% were categorized as moderate and more than 75% were categorized as having good nutrition knowledge (Committee of Nutrition, Attitude and Practice Universiti Kebangsaan Malaysia, 1999).

3.4.4 Stress

This study was using a Perceived Stress Scale (PSS) to measure stress levels among pregnant women. PSS was first developed in 1983, with the aim to help researchers comprehend how different situations could affect an individual's feeling and stress level. This instrument was designated to be used in community as the questions provided were easy to comprehend (Cohen & William, 1983). This instrument was widely used in research involving pregnant women and it has been validated as a tool to measure maternal stress during pregnancy (Karam et al., 2012). There were 10 questions in this questionnaire in which participants gave scores to each question (0 = Never, 1 = Almost Never, 2 = Sometimes, 3 = Fairly Often and 4 = Very Often). Question 4, 5, 7 and 8 were reversed when scoring to (0 = 4, 1 = 3, 2 = 2, 3 = 1, 4 = 0). The total scores were calculated and categorized based on American Sociological Association (1983). Score ranging from 0 – 13 was considered as low stress, scores ranging from 14 – 26 was considered as moderate stress and scores ranging from 27 – 40 was considered as high perceived stress.

3.4.3 Depression Symptoms

Antenatal depression was measured using Edinburgh Depression Scale (EDS). This EDS was the same as Edinburgh Postnatal Depression Scale (EPDS), an instrument that has not only been used to measure postnatal depression symptoms, but the prenatal depression symptoms as well. EPDS has been validated to be used in many groups of population such as women in childbearing age, menopausal women, men, and older adults. As the usage of EPDS has been widely used in other groups and not limited to postnatal women only, the tool has been renamed as Edinburgh Depression Scale (EDS). The Edinburgh Depression Scale was a valid instrument that can be used to measure depression symptoms among prenatal and postnatal women in all trimesters (Bergink

et al., 2011). It was a self-administered questionnaire that required participants to recall their depressive symptoms over 7 days (Nathanson et al., 2018).

There were 10 items in this questionnaire and 4 choices were provided for each question. The 4 choices were scored from 0 to 3. Questions 1, 2, and 4 were scored 0, 1, 2 or 3 with the first box scored as 0 and the last box scored as 3. Questions 3, 5 and 10 will be scored reversely, with the first box scored as 0 and the last box scored as 3. The overall scores then were calculated and categorized according to the BC Reproductive Mental Health Program and Perinatal Services (2014). Total scores of 10 and above indicated a moderate depression symptom whilst participants with total scores of 13 and above indicated a strong depression symptom

3.4.5 Social support

This study was using the Multidimensional Scale of Perceived Social Support (MSPSS) to measure respondents' social support. MSPSS has been used to measure the sufficiency of social support from family, friends and partners and this instrument has been validated to be used in adults and pregnant women (Stewart et al., 2014). The questionnaire consists of 12 items with 4 items for measuring family's support, 4 items for measuring friends' support and 4 items for measuring partner's support. The scores ranged from 1 to 5 (1 = strongly disagree, 2 = mildly disagree, 3 = neutral, 4 = mildly agree, 5 = strongly agree). The mean scores were calculated according to the subscale. Items 3,4,8 and 11 were sum up and divided by 4 to measure family's support, items 6, 7, 9 and 12 were sum up and divided by 4 to measure friend's support and items 1,2,5 and 10 were summed up and divided by 4 to measure partner's support. The overall perceived scores then were computed by adding the scores altogether. Scores ranging between 12 to 35 were categorized as

low perceived social support, scores between 36-60 were categorized as medium and scores of 61 and above were categorized as high perceived social support.

3.4.3 Dietary quality

The dietary quality of the respondent was measured using a food frequency questionnaire (FFQ) that was adopted from Malaysian Adults Nutrition Survey MANS 2014 (Institute of Public Health, 2014). There are 15 food categories in this questionnaire with a total of 165 food items. The questionnaire comprised of 26 items of fruits, 18 items of cereal and cereals products, 16 items of drinks, 15 items of fish and seafood, 14 items of vegetables, 12 items of confectionaries, 11 items for non-muslim meat and meat products, 8 items of bread spread, 8 items of fast food, 6 items for milk and milk products, 6 items for alcoholic drinks, 5 items of legumes and legumes products and 4 items of egg.

The data from FFQ then were further measured using the Malaysia Healthy Eating Index that has been developed by Lee et al (2011). This tool has been widely used to measure the overall dietary quality among participants in Malaysia and it has been validated to be used in Malaysian adult population (Goh & Norimah, 2012). The index consists of seven food groups and one nutrient group, with a total of eight groups. The score of each food category was calculated by using Formula A (refer to Table 3.2). Next, the total scores from all eights groups were calculated to get the percentage of dietary quality (refer to Formula B; Table 3.2). The calculated percent of dietary intake then were categorized accordingly; less than 50% indicated a poor dietary quality, 51% to 80% indicated that the diet needs several improvements and more than 80% indicated a good dietary quality.

Table 3.2 Dietary quality formula

Formula A
Scores = (servings taken by the participants / servings recommended for pregnant women) × 10
Formula B
% Diet quality = (total scores from nine groups / 80%) × 100 %

Table 3.3 Recommended servings for pregnant women

Food Groups	**Recommended Servings**	**Food Groups**	**Recommended Servings**
Grains and cereal	6	Fish and seafoods	1
Vegetables	3	Legumes	1
Fruits	2	Milk and dairy products	2
Meat, poultry and eggs	1	Total fats	< 30% of total energy intake

(Source: Malaysian Dietary Guideline, 2010)

Table 3.4 Malaysian Healthy Eating Index (HEI) scoring for nutrients.

HEI score	**0**	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**
Energy intake from fat (%)	≥35.0	34.5	34.0	33.5	33.0	32.5	32.0	31.5	31.0	30.5	≤30.0

3.5 Study approval

Ethical approval was applied to the Ethics Committee for Research Involving Human Subjects in Universiti Putra Malaysia (JKEUPM) and the application with JKEUPM-2021-082 transaction number was approved as stated in the appendix part A.

3.6 Pretest

A pretesting was conducted before the data collection began. The pretesting was in March 2021 and involved 26 pregnant women in the third trimester (20% of sample size). The aim of doing this pre-testing was to check the relevance of the questionnaire and the estimated time taken to answer the questionnaire through the feedback of pre-testing subjects. The results gained were not included in the statistical analysis.

3.7 Study procedures

Ethical approval was obtained from the Ethics Committee for Research Involving Human Subjects in Universiti Putra Malaysia (JKEUPM) prior to the data collection. Data collection was conducted from the end of March till the end of April 2021. Respondents of this study were approached by using Facebook Group and recruited based on the exclusion and inclusion criteria. Respondents who agreed to participate were given consent prior to the participation. There was a total of 84 respondents who filled in the questionnaire and agreed to be the respondents.

3.8 Statistical analysis

This study was using IBM SPSS Statistics Version 25 to analyse all the statistics. The results of categorical variables were displayed as frequency and percentage while the results of continuous variables were displayed as mean and standard deviation. The level of significance was set to

$p<0.05$. Pearson's Product Moment was used to test the association between continuous variables, Spearmen Rho test was used to test the association between ordinal categorical variables whilst chi square was used to test the association between nominal categorical variables.

CHAPTER 4
RESULTS AND DISCUSSION

4.0 Results and discussion

One hundred and thirty-two pregnant women who fulfilled all the criteria were invited to join this study and only 84 of them agreed to become the respondents. The response rate obtained throughout the study was 63.6%. The rejection from respondents was mainly due to a busy schedule.

4.1 Socio-demographic background

Table 4.1 demonstrated the socio-demographic background of the respondents. A total of 84 respondents (age between 19 to 50) were involved in this study and the mean age of respondents was 28.19 ± 5.27 years. The majority of the respondents were Malay (89.3%) followed by Chinese (6.0%) and Indian (2.4%) and other ethnicities such as Iban (2.4%). Based on table 4.1, a few of the respondents have obtained secondary education (11.9%) whilst most of them obtained tertiary education (88.1%) and none of the respondents were having primary or non-formal education. In addition, it can be observed that the mean household income of the respondents was RM 3995 ± 2660.71, much lower from the national statistical data whereby the mean household income of Malaysian population was RM7901 (Department of Statistic, 2020). Besides, most of the respondents have a total household income less than RM4849 (63.0%) which was classified as B40 category and 1.2% of the respondents having monthly household income more than RM10 960 which was classified as T20. When compared with the national statistic, the results obtained in this study differed as only 16.0% of Malaysian population were in the B40 category and 46.8% were in the T20 category according to the national statistic (Department of Statistic, 2020).

Table 4.1 Socio-demographic background of the respondents (n=84)

Variables	n (%)	Mean ± SD
Age (years)		28.19 ± 5.27
Ethnicity		
Malay	75 (89.3)	
Chinese	5 (6.0)	
Indian	2 (2.4)	
Others	2 (2.4)	
Educational level		
Secondary	10 (11.9)	
Tertiary	74 (88.1)	
Household income		RM3995 ± 2660.71
RM1000-RM2999	32 (38.0)	
RM3000-RM4999	21 (25.0)	
RM5000-RM6999	11 (13.0)	
RM7000-RM8999	4 (4.8)	
≥RM9000	6 (7.1)	
B40 (≤RM4849) *	53 (63)	
M40 (RM4850 - RM10 959)	19 (22.6)	
T20 (≥RM 10 960)	1 (1.2)	

*Classification based on Department of Statistic Malaysia

4.2 Nutrition Knowledge

From the total score of 21, the mean score of nutrition knowledge of the respondents was 16.44 ± 2.98. From the data that has been tabulated in Table 4.2, it can be seen that the majority of the respondents have a moderate nutrition knowledge (69.0%) whilst only a few of the respondents

have a good nutrition knowledge (10.7%). In contrast to the current finding, a study that was conducted among 88 pregnant women in Malaysia found that the majority of the respondents in the study have good nutrition knowledge (Soon et al., 2018). The difference in the findings might be due to the prevalence of nutrition knowledge among pregnant women were generally high and pregnant women were more likely to received nutrition information from health professionals such as doctors and nurses, mass media, friend and various health programs that were focusing on pregnant women (Soon et al., 2018). In addition, Table 4.3 shows that the percentage of respondents answering correct and wrong answers in the nutrition knowledge questionnaire. The highest percentage of respondents answer correctly and none of the respondents answered wrongly was question 17 (100.0%) indicating that all of the respondents know which food preparation method can lead to increase fat contents. Apart from that, question 4 also has a high percentage respondents answered wrongly (76.2%) showing that more than half of the respondents do not know which food among the list have the highest cholesterol contents.

Table 4.2 Nutrition Knowledge Categories (n=84)

Categories	**n (%)**
Low	17 (20.2)
Moderate	58 (69.0)
High	9 (10.7)
Mean ± SD	16.44 ± 2.98

Table 4.3 Nutrition Knowledge Questionnaire (n=84)

Items	n (%)	
	True	False
1. In the list below, the food with highest content of protein	75 (89.3)	9 (10.7)
2. Among the food listed below, which one has the highest content of fibre	70 (83.3)	14 (16.7)
3. The food that are rich in vitamin, mineral and fibre are	61 (72.4)	23 (27.4)
4. Which one of the foods listed below contains the highest amount of cholesterol	20 (23.4)	64 (76.2)
5. The food with a lot of salt	74 (88.1)	10 (11.9)
6. A balance diet has the following nutrients	79 (94.0)	5 (6.0)
7. According to the food pyramid, the food you know are advised to take the least	76 (90.5)	8 (9.5)
8. According to the food pyramid, the food that you can eat the most	62 (73.8)	22 (26.2)
9. The nutrient which will helps to build our body	67 (79.8)	17 (20.2)
10. You can get all the required nutrient by	66 (78.6)	18 (21.4)
11. The nutrient that provides us with the most energy (calories)	21 (25.0)	63 (75.0)
12. In the list below, the food with highest carbohydrate contents	78 (92.9)	5 (6.0)
13. Body mass index is an indicator for	69 (82.1)	15 (17.9)
14. Aerobic exercise (example; jogging, cycling, aerobic dance, fast walking and swimming) are importance for	78 (92.9)	6 (7.1)
15. Over consumption of energy (calories) can lead to	80 (95.2)	4 (4.8)
16. In order to avoid obesity and maintain desirable body weight, we have to balance our food intake with	67 (79.8)	17 (20.2)
17. Which of the following ways of preparing food will increase the fat content	84 (100.0)	0 (0.0)
18. Obesity will increase risk to the following disease	81 (95.4)	3 (3.6)
19. The risk of consuming food with excessive sugar is	78 (92.9)	5 (6.0)

Table 4.3 Nutrition Knowledge Questionnaire (n=84) (continue)

20. Arrange the following foods according to their cholesterol content by choosing number 0, 0, 0, 1 or 0 in the columns provided. No 0 is the highest cholesterol content and no 0 is the lowest cholesterol	22 (26.2)	61 (72.6)

4.3 Stress Level

The mean score of the respondents in this study for Perceived Stress Scale Questionnaire was 18.98 ± 4.27 that was considered as moderate perceived stress level. Moderate stress level was defined as a stress level that still can be managed and control by oneself (Australian Association of PNI Practitioner, 2014). As shown in Table 4.4, it can be seen that a total of 80 respondents were in moderate perceived stress category (83.3%) whilst a minority of the respondents have high perceived stress (7.1%). Contradict with a study that was conducted by Priya et al. (2018) where more than 70% of the respondents in the study were found to have a low stress level, 10% were having a moderate stress level, and none were having high stress level. Pantha et al. (2014) in their study found that more than half of the respondents in the study were having low and moderate stress and only 34.2% of the respondents were having a high stress level. Majority of the pregnant women might have moderate and low stress level due to their individual coping strategies as the ability to cope with the arise problems could make an individual resilient and decrease the stress exposure during pregnancy (Guardino & Schetter,2015). Based on Table 4.5, it was found that the highest frequency was 'sometimes' in questions 7 which was a question pertaining to how frequent respondents were able to control irritations in their life whilst the least was 'never' in question 10 which was a question pertaining to how frequent respondents felt difficulties were piling up so high that they could not overcome them.

Table 4.4 Stress Level Categories of the Respondents (n=84)

Categories	**n (%)**
Low	8 (9.5)
Moderate	70 (83.3)
High	6 (7.1)
Mean ± SD	18.98 ± 4.27

Table 4.5 Perceived Stress Scale Questionnaire (n=84)

Items	**n (%)**				
	Never	**Almost never**	**Sometimes**	**Fairly often**	**Very often**
1. How often have you been upset because of something that happened unexpectedly?	6 (7.1)	8 (9.5)	48 (57.1)	18 (21.4)	4 (4.8)
2. How often have you felt nervous and "stressed"?	4 (4.8)	12 (14.3)	48 (57.1)	12 (14.3)	8 (9.5)
3. How often have you felt that things were going your way?	4 (4.8)	28 (33.3)	34 (40.5)	12 (14.3)	6 (7.1)
4. How often have you felt confident about your ability to handle your personal problems?	16 (19.0)	16 (19.0)	38 (45.2)	10 (11.9)	4 (4.8)
5. How often have you felt that you were unable to control the important things in your life?	10 (11.9)	16 (19.0)	42 (50.0)	12 (14.3)	4 (4.8)
6. How often have you found that you could not cope with all the things that you had to do?	4 (4.8)	12 (14.3)	48 (57.1)	12 (14.3)	8 (9.5)
7. How often have you been able to control irritations in your life?	6 (7.1)	24 (28.6)	50 (59.5)	4 (4.8)	0 (0.0)
8. How often have you felt that you were on top of things?	4 (4.8)	26 (31.0)	42 (50.0)	12 (14.3)	0 (0.0)

Table 4.5 Perceived Stress Scale Questionnaire (n=84) (continue)

9.	How often have you been angered because of things that were outside of your control?	8 (9.5)	10 (11.9)	42 (50.0)	16 (19.0)	8 (9.5)
10.	How often have you felt difficulties were piling up so high that you could not overcome them?	2 (2.4)	16 (19.0)	50 (59.5)	14 (16.7)	2 (2.4)

4.4 Depression Symptoms

Based on table 4.6, the mean score of depression symptoms for the respondents in this study was 9.36 ± 5.51, indicating a low depression symptom. The current finding was not much differed from a study that was conducted by Fowles et al. (2012) where the mean score for depression symptoms was 8.1 which also indicates a low depression symptom. Besides, the same table shows that the majority of the respondents have low depression symptoms (54.8%) and 45.2% of the respondents have a moderate to high depression symptoms. This finding was consistent with another study that was conducted in the United States where over 40% of the respondents had moderate to high depression symptoms (Fowles, Bryant, et al., 2011). There were a lot of factors that can contribute to depression during pregnancy including poor perceived social support and hormonal changes experienced during pregnancy (Sparling et al., 2020). Estriol and progesterone level rises up during pregnancy compared to normal individual and these hormones have been prove to cause a neuroregulatory effect on the central serotonin system which in turn influence the psychologic distress of the mother (Fan et al., 2009). Furthermore, table 4.7 shows the distribution of questions for the Edinburgh Depression Scale (EDS) questionnaire and it can be observed that a huge amount of the respondents answered 'never' for question 1 (85.7%) where the statement was respondents have been able to laugh and see the funny side of things and none of the respondents answered, 'fairly often'.

Table 4.6 Depression Symptoms Categories

Items	n (%)
Low depression symptoms	46 (54.8)
Moderate depression symptoms	22 (26.2)
High depression symptoms	16 (19.0)
Mean ± SD	9.36 ± 5.51

Table 4.7 Edinburgh Depression Scale (EDS) Questionnaire

Items	n (%)			
	Never	Almost never	Sometimes	Fairly often
1. I have been able to laugh and see the funny side of things	72 (85.7)	4 (4.8)	8 (9.5)	0(0.0)
2. I have looked forward with enjoyment to things	59 (70.2)	17 (20.2)	6 (7.1)	2 (2.4)
3. I have blamed myself unnecessarily when things	11 (13.1)	39 (46.4)	22 (26.2)	12 (14.3)
4. I have been anxious or worried for no good reason	12 (14.3)	20 (23.8)	42 (50.0)	10 (11.9)
5. I have felt scared or panicky for no very good reason	32 (38.1)	35 (41.7)	10 (11.8)	7 (8.3)
6. Things have been getting on top of me	10 (11.9)	38 (45.2)	28 (33.3)	8 (9.5)
7. I have been so unhappy that I have had difficulty sleeping	28 (33.3)	38 (45.2)	10 (11.9)	8 (9.5)
8. I have felt sad or miserable	28 (33.3)	40 (47.6)	10 (11.9)	6 (7.1)
9. I have been so unhappy that I have been crying	20 (23.8)	56 (66.7)	6 (7.1)	2 (24)
10. The thought of harming myself has occurred to me	54 (64.3)	12 (14.3)	16 (19.0)	2 (2.4)

4.5 Social Support

Based on Table 4.8, the overall mean score for perceived social support among the respondents was 48.9 ± 55 which indicated a moderate perceived social support On top of that, when looking into the categories of perceived social support as displayed in Table 4.8, most of the respondents have medium perceived social support (69.0%) and only a few of them have high perceived social support (14.3%). The finding was consistent with a study involving 896 pregnant women where more than half of the respondents have a moderate overall perceived social support (Elsenbruch et al., 2007). While having a moderate social support were preferable than having low social support, it was recommended for the pregnant women to have high perceived social support. Pregnancy was a considered as a critical period in which the high perceived social support was needed more than ever as well as the effective and precise attention from their friends, family and partner (Anderson Steeves et al., 2016). The perception of social support during pregnancy might bring positive impact on the overall health besides it works as a buffer for stress experienced during pregnancy (Iranzad et al., 2014; Roth, 2004).

As what that has been shown in table 4.9, the mean for each subscale of Multidimensional Scale of Perceived Social Support (MSPSS) were 4.14 ± 1.21, 3.86 ± 1.29 and 4.24 ± 1.28 respectively. The highest mean score was from perceived partner support whilst the lowest mean score was perceived friends' support. Each of the social support from family, friends and partner were equally important and vital for pregnant women as it can affect the psychological feeling of the mother. The social support from family could ameliorate mental health during pregnancy (Hu et al., 2019) while social support from friends could boost up the feeling of self-efficacy through their advice and reassurance (Dunn et al., 2003; Nolan et al., 2012). Furthermore, social support given by the partner could strengthen the relationship between mothers and their spouse and brought over the

sense of teamwork in which the mother does not feel alone during pregnancy (University of Michigan Health, 2020). As for the details on Multidimensional Perceived Social Support (MPSS) questionnaire, questions 3,4,8 and 11 were used to measure the perceived family support while questions 6,7,9 and 12 were used to measure perceived friends support and questions 1,2,5 and 10 were used to measure perceived partners' support. In the perceived family support subscale, more than half of the respondents 'mildly agree' that their family tries to help them (54.8%) whilst none of the respondents 'very strongly agree' that they can talk about their problems to family (0.0%). For the second subscale which was perceived as friends support, a huge number of the respondents 'mildly agree' that they have friends with whom they can share sorrow and joy while 0.0% of the respondent 'very strongly agree' that they have friends that they can count on and rely on. Moreover, the majority of the respondents 'mildly agree' that they have looked forward to things with enjoyment and all of the respondents 'agree' that they have been able to laugh and see the funny side of things (0.0%).

Table 4.8 Social Support Categories

Categories	n (%)
Low perceived support	14 (16.7)
Medium perceived support	58 (69.0)
High perceived support	12 (14.3)
Mean ± SD	48.9 ± 55

Table 4.9 Multidimensional Scale of Perceived Social Support (MSPSS) Questionnaire

Items	n (%)						
	Very Strongly Disagree	**Strongly Disagree**	**Mildly Disagree**	**Neutral**	**Mildly Agree**	**Strongly agree**	**Very Strongly agree**
Perceived family support							
3. My family really tries to help me	4 (4.8)	6 (7.1)	6 (7.1)	20 (23.8)	46 (54.8)	1 (1.2)	1 (1.2)
4. I get the emotional help & support I need from my family	6 (7.1)	4 (4.8)	10 (11.9)	16 (19.0)	40 (47.6)	5(6.0)	3 (3.6)
8. I can talk about my problems with my family	8 (9.5)	10 (11.9)	8 (9.5)	12 (14.3)	45 (53.6)	1 (1.2)	0 (0.0)
11. My family is willing to help me make decisions	6 (7.1)	4 (4.8)	12 (14.3)	22 (26.2)	37 (4.0)	1 (1.2)	2 (2.4)
Mean ± SD				4.14 ± 1.21			
Perceived friends support							
6. My friends really try to help me	6 (7.1)	8 (9.5)	10 (11.9)	20 (23.8)	37 (44.0)	2 (2.4)	1 (1.2)
7. I can count on my friends when things go wrong	10 (22.9)	6 (7.1)	10 (11.9)	28 (33.3)	29 (34.5)	1 (1.2)	0 (0.0)
9.I have friends with whom I can share my joys and sorrows	6 (7.1)	10 (11.9)	8 (9.5)	14 (16.7)	44 (52.4)	1 (1.2)	1 (1.2)
12. I can talk about my problems with my friends	10 (11.9)	12 (14.3)	10 (11.9)	22 (26.2)	26 (31)	3 (3.6)	1 (1.2

Table 4.9 Multidimensional Scale of Perceived Social Support (MSPSS) Questionnaire (continue)

Mean ± SD				3.86 ± 1.29			
Perceived partner support							
1. I have been able to laugh and see the funny side of things	10 (11.9)	0 (0.0)	8 (9.5)	18 (21.4)	46 (54.8)	1 (1.2)	1 (1.2)
2. I have looked forward with enjoyment to things	6 (7.1)	2 (2.4)	12 (14.3)	4 (4.8)	52 (61.9)	6 (7.1)	2 (2.4)
5. I have a special person who is a real source of comfort to me	8 (9.5)	4 (4.8)	8 (9.5)	14 (16.7)	44 (52.4)	1 (1.2)	4 (4.8)
10.There is a special person in my life who cares about my feelings	8 (9.5)	2 (2.4)	10 (11.9)	14 (16.7	49 (58.3)	0 (0.0)	1 (1.2)
Mean ± SD				4.24 ± 1.28			

4.6 Dietary Quality

The dietary quality score of the respondents were calculated using Malaysian Healthy Eating Index (MHEI) and categorized accordingly. From Table 4.10, it can be seen that the mean score for the dietary quality was 62.93±18.64 indicating a moderate dietary quality and majority of the respondents fall into moderate or need improvement category (60.7%) whilst only a 15.5% of them have good dietary quality. The prevalence of the current finding was consistent with another study that was conducted by Fowles et al. (2012) whereby it was found that more than half of the respondents in the study have a moderate and low dietary quality and scored low in The Dietary Quality Index–Pregnancy (DQI-P) (Fowles et al., 2012). The current finding was also prevalent in local context as another study that was conducted in Malaysia involving 78 pregnant women found that less than half of the participants in the study have a good dietary quality and managed to meet the recommended dietary guideline (Hamid et al., 2019). Low dietary quality among pregnant women was associated with maternal complication including gestational diabetes, obesity and hypertension as well as foetus complication such as higher or low birthweight and increase the risk of getting chronic disease during adulthood (Deierlein et al., 2021; Zhu et al., 2019). This finding shows that a progressive initiative needs to be made to ensure the good dietary quality among pregnant women as nutrition during pregnancy is crucial for the development and differentiation of the organ of the baby apart from supporting the fetus growth (Rifas-Shiman et al., 2006; The American College of Obstetricians and Gynaecologist, 2021).

Table 4.10 Dietary Quality Categories

Categories	n (%)
Poor dietary quality	20 (23.8)
Need improvement	51 (60.7)
Good dietary quality	13 (15.5)
Mean ± SD	62.93 ± 18.64

Hypotheses testing (Factors Associated with Dietary Quality)

4.7 There is no association between socio-demographic background with dietary quality

Pearson Product Moment correlation was used to determine the correlation between age and monthly household income with dietary quality, Chi square was used to test the association between ethnicity with dietary quality whilst Spearmen Rho was used to test the association between education level with dietary quality of the respondents. Based on Table 4.11, there was a weak negative correlation but not significant (r=-0.103, p=0.373) between age and dietary quality among pregnant women. This finding contradicts with a study that was conducted in the United States involving 1777 pregnant women. The study found that there was positive correlation between ages and dietary quality score (95% CI [0.7-1.8]) as participants who were older had better AHEI-P scores (Rifas-Shiman et al., 2009). Moreover, this study found no correlation between education level and monthly household income with dietary quality of the respondents. (p>0.5). These findings were consistent with a study conducted by Tsigga et al. (2011) whereby there was no correlation found between education level and monthly household income with dietary quality among pregnant women (p>0.005). However, a study that was conducted in Singapore found that there was a significant association between education level and dietary quality as respondents with secondary education and lower have a poorer dietary quality (Han et al., 2015). Apart from that, this study has also found that there was no association between ethnicity and dietary quality among the respondents (p=0.749). This finding was differed from a study that found there was an association between ethnicity and dietary quality (OR=2.54, 95% CI [1.55-4.16]) (Han et al., 2015). The differences between findings might be due to this study having an unbalanced ethnicity distribution in which the majority of the respondents were Malay (89.3%). Han et al. (2015) in their study mentioned that being Malay was associated with lower and

moderate dietary quality score due to several factors such as socioeconomic factors and cultural belief.

Table 4.11 Association between socio demographic and dietary quality

Variables					
	Low	**Moderate**	**Good**	**X^2/r/rs value**	**p-value**
Age (years)				0.103	0.373
Education level				0.115	0.297
Monthly household income (RM)				0.510	0.667
Ethnicity				3.591	0.749
Malay	20 (29.0)	40 (58.0)	9 (13.0)		
Non-Malay	0	8 (100.0)	0		

4.8 There is no significant association between nutrition knowledge and dietary quality

From the result that has been tabulated in Table 4.12, it can be seen that there was an association but not significant between nutrition knowledge and dietary quality of the participants (r=0.134, p=223); hence, the hypothesis of there is a significant association between nutrition knowledge and dietary quality among pregnant women was rejected. Consistent with the current finding, a study that was conducted by Fowles et al. (2011) found that there was no significant correlation between nutrition knowledge and dietary quality among 118 pregnant women in the United States. Having a good nutrition knowledge may not necessarily indicate a good dietary quality as nutrition knowledge alone might not be enough. Besides, the acceptance toward knowledge as well as the application of nutrition knowledge play an important role in determining a good dietary quality. The nutrition knowledge may not be translated enough through the ability to purchase and

consume healthy food and understand the nutrition label to obtain a good dietary quality (Spronk et al., 2014).

Table 4.12 Association between nutrition knowledge and dietary quality

Variables	**Dietary quality**	
	r-value	**p-value**
Nutrition knowledge	0.134	0.223

4.9 There is an association between psychosocial factors (stress level and social support) with dietary quality

From the Pearson Product Moment analysis that have been conducted, it was found that there was a significant and inversely association between stress level and dietary quality (r=-0.235, p=0.031) in which the stress level of the respondents negatively influences its dietary quality (Table 4.13). The current finding was supported with two previous studies. One of the studies found that stress level was strongly and inversely associated with overall dietary quality during pregnancy ($p<0.05$) (r=-0.32) (Fowles, Murphey, et al., 2011) while another study found that there was association between stress level and dietary quality of the respondents (p=0.018) but not certain food groups such as fruits and vegetables ($p>0.05$) (Fowler, 2011). Higher perceived stress levels may decrease the respondent's coping abilities which could lead to low dietary quality. For example, pregnant women with higher stress levels often choose to cope with a stressful situation by consuming unhealthy food and a frequent habit of snacking (Fowles, Murphey, et al., 2011). In addition, pregnant women with higher stress level were more prone to have a higher energy dense and low nutrient food; hence, decreasing their dietary quality (Hurley et al., 2005)

Apart from that, there was no association found between depression symptoms with dietary quality of the pregnant women (r=0.129, p=0.241). Opposed with the current finding, a study conducted

in Northern California has found that there was an association between depression symptoms and dietary quality of the participants as participants with depression symptoms have twice the odds of having poor dietary quality (odds ratio 1.80, 95% CI 1.23 to 2.60) compared to those who do not have depression symptoms (Avalos et al., 2020). The current finding was also inconsistent with a study conducted by Fowles et al. (2012) whereby there was a negative and a significant correlation between depression symptoms and dietary quality (r=-0.41, p=0.002). The same study has also found that respondents with low dietary scores (n=35) showed a higher depression symptom (9.6±5.1 vs 6.7±5.1). Majority of the respondents in this study have a moderate depression symptom and it might be a bit tricky for the vulnerable group such as pregnant women to disclose their depression symptoms in the questionnaire. A total of 43% from the 1054 adults in California prefer not to disclose their depression symptoms to others due to various reasons including concern of being referred to psychiatrist and being prescribed with antidepressant (Bell et al., 2011).

Overall social support was found to be associated with dietary quality of the pregnant women (r=0.283, p=0.009). It has also been found that the subcomponent of social support which were social support from family (r=0.265, p=0.015), social support from friends (r=0.272, p=0.012) and social support from partner (r=0.282, p=0.009) were significantly correlated with dietary quality of pregnant women. Hence, the hypothesis that there was an association between social support and dietary quality among pregnant women was accepted and the null hypothesis can be rejected. The current finding was supported by a study conducted by Fowles, Bryant, et al. (2011). This might be due to pregnant women with higher perceived social support had a less stress and depression occurrence and had finer dietary habits; hence, a finer dietary quality (Hurley et al., 2005). Having a high perceived social support was well associated with having a good emotional

and instrumental support which in turn reduced the effect of life stress and influenced dietary quality (Elsenbruch et al., 2007). Moreover, Pieroth et al. (2017) in their study mentioned that social relationships that can be gained through social support can encourage good health behaviour as it can encourage good dietary choices. Having a supportive social support system may enhance the feeling of self-belonging, emotional stability, and self-worth that definitely influence the motivation for self-care including adequate dietary intake (Jackson, 2006). Apart from that, the subsequent analysis from the previous study has also found that there was a significant correlation between social support from family and friends, but not from partners (Fowles, Bryant, et al., 2011).

Table 4.13 Association between psychosocial factors and dietary quality

Variables	**Dietary quality**	
	r-value	**p-value**
Stress level	-0.235	0.031*
Depression symptoms	0.129	0.241
Social support	0.283	0.009*
Social support from family	0.265	0.015*
Social support from friend	0.272	0.012*
Social support from partner	0.282	0.009*

*Significant at $p<0.05$

CHAPTER 5
CONCLUSION, LIMITATION AND RECOMMENDATION

5.1 Conclusion

There were 84 respondents who lived in Selangor involved in this study. It was found that the mean age of the respondents was 28.19 ± 5.27 years with a lot of them being Malay (89.3%), obtained secondary education, having average monthly household income of RM 3995 ± 2660.71 that was categorized as B40 category. This study has also found that most of the respondents have a moderate dietary quality (60.7%) along with moderate nutrition knowledge (69.0%), moderate perceived stress level (83.3%), low depression symptoms (54.8%) and medium perceived social support (69%). In addition, this study has also found that there was no correlation between sociodemographic background, nutrition knowledge and depression symptoms with dietary quality among pregnant women. On the other hand, there was an association found between psychosocial factors such as stress level (p=0.031) and social support (p=0.009) with dietary quality of the pregnant mother.

Based on this conclusion, it can be seen that the majority of the pregnant women in this study were having moderate dietary quality. Hence, more nutritional program awareness should be conducted to cater and tackle this issue. Besides, healthcare practitioners such as nutritionists and dietitians should consider psychosocial factors when doing assessment and intervention as it might impact the dietary intake and quality of the patient. Screening for psychosocial factors such as stress level and perceived social support prior to the nutrition assessment might aid practitioners in comprehending the patient.

5.2 Limitation

There were several limitations that could be identified in this study. Firstly, the response rate in this study could not achieve 100% and this might impact the findings of the study as the sample size was not as expected. Secondly, as this study was conducted online, there might be some uncertainty for the validation data as the researchers cannot confirm the presence of the participants compared to face-to-face collection data besides there were a lot of challenges in terms of internet access. As the questionnaires were disseminated virtually, the questionnaire could only be accessed to those who can afford the internet and technology such as mobile phone or tab. Apart from that, as this study was only conducted among pregnant women in Selangor along with a small sample size ($n<100$), the finding might not be enough to represent the whole population of Malaysia. Therefore, the results could not be generalized to the whole population

Next, the Food Frequency Questionnaire (FFQ) used in this study did not take into account the method of cooking such as frying and mainly focused on the food group. This could affect the finding as the fat intake of the respondents might differ if cooking method taken into account. Furthermore, the reference used in this study might be a bit outdated as this study was using Malaysian Dietary Guideline 2010 as the references. The reference used was as a general recommendation for pregnant women with 2000 kcal energy needs, and it did not take into account the different calories needed between each individual. In addition, the sampling method which is purposive sampling was prone to researcher's bias. On top of that, as this study was a cross-sectional study, it can only measure the factors associated with dietary quality, but no cause-effect relationship can be concluded.

5.3 Recommendation

The first recommendation is to increase the duration of collecting data to ensure more than 80% response rate can be achieved. On top of that, it would be beneficial for the researchers to conduct the data collection face-to-face to ensure the validity of data. Apart from that, the latest Malaysian Dietary Guideline 2020 should be used as the reference to ensure the study was using up-to-date references. Furthermore, a cohort study might be needed to determine the cause-effect relationship between factors associated with dietary quality among pregnant women.

The recommendation that can be suggested from the output of this study is to increase the awareness program pertaining to calories needed and the importance of achieving the recommended nutrients to pregnant women. This is to ensure high dietary quality during pregnancy can be achieved as this study found that the majority of the respondents have a moderate and low dietary quality. Apart from that, it is also recommended for healthcare workers particularly dietitians and nutritionists to take into account psychosocial factors such as stress level and perceived social support when assessing maternal dietary intake or when doing nutrition intervention as these factors were found to influence dietary quality of pregnant women.

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ETHICS COMMITTEE FOR RESEARCH INVOLVING HUMAN SUBJECTS
(JKEUPM)
UNIVERSITI PUTRA MALAYSIA

Research title	:	**Factors Associated with Dietary Quality Among Pregnant Women in Selangor.**
Study Site	:	**Selangor**
JKEUPM Ref No.	:	**JKEUPM-2021-082**
Researcher	:	**Norfarzana Mohd Noordin**
Supervisor	:	**Dr. Nurzalinda Zalbahar@Zabaha**

Documents received and reviewed with reference to the above study:

1. Ethics Application Form, Version 1 dated 2/2/2021
2. Respondent Information Sheet & Consent (English), Version 2 dated 2/3/2021
3. Respondent Information Sheet & Consent (Malay), Version 2 dated 2/3/2021
4. Proposal (English), Version 2 dated 2/3/2021
5. Questionnaire/Interview (English), Version 1 dated 2/2/2021
6. Questionnaire/Interview (Malay), Version 1 dated 2/2/2021
7. Curriculum Vitae of:
    a. Dr. Nurzalinda Zalbahar@Zabaha

The University Research Ethics Committee, Universiti Putra Malaysia (JKEUPM) operates in accordance to the ICH-GCP Guidelines.
Decision by JKEUPM:

[x] Approved

[x] **Permission MUST BE OBTAINED from the respective hospitals/ institutions before conducting the research**

[ ] Disapproved

Please note that the approval is **VALID UNTIL 16 MARCH 2022**

Researchers should comply with the following:

I. Complete a Study Final Report upon study completion (Form 3.2).

II. Ethical approval is required in the case of amendments/ changes to the study documents/ study sites/ study team.

III. Applicable for Clinical Trial Studies and Clinical interventional Studies only: Progress Report has to be submitted to JKEUPM at every 6 months from the date of approval (Form 3.1). Report occurrences of all Serious Adverse Events (SAEs), Suspected Unexpected Serious Adverse Reaction (SUSARs) and Protocol Deviation/ Violation at all JKEUPM approved sites to JKEUPM. SAEs are to be reported within 15 calendar days from awareness of event by investigator. Initial report of SUSARs are to be reported as soon as possible but not later than

Part B: Respondent consent form

3rd March 2021 (Version 1)

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 :

Factors associated with dietary quality among pregnant women in Selangor

2. INTRODUCTION:

Most of the pregnant women are unable to abide by food and nutrient recommendations as studies have shown that most pregnant women have an inadequate nutrient-dense food consumption, higher energy-dense food consumption and have fewer fruits and vegetable consumption (Subarnalata & Basumati, 2006; Gemeda et al., 2013; Liu et al., 2015). Furthermore, there are increase proportion of pregnant women with weight above healthy range. Globally, 24.3 million of pregnant women were overweight whilst 14.6 million pregnant women were obese with rapid increase in lower middle-income countries and upper middle income countries including Malaysia (Chen et al., 2018). Thus, this study is aimed to determine the association between demographic background, nutrition knowledge, psychosocial factor (stress level, symptom of depression and social support) with dietary quality among pregnant women aged 18 to 45 years old. This study is important as it could help researcher to understand the factors that influence dietary quality among pregnant women.

3. WHAT WILL YOU HAVE TO DO?

a) Answer online questionnaire that consist of several sections. Participants need to answer all sections which included socio-demographic background, nutrition knowledge, stress level, depression symptom, social support and food frequency questionnaire.
b) It is important to note that the participation in this study in voluntary, hence no payment will be provided to participants.
c) This study is voluntary, thus; participants have the right to withdraw from this study at any time without giving any reasons and no penalty will be applied upon withdrawal.

4. WHO SHOULD NOT PARTICIPATE IN THE STUDY?

The exclusion criteria for participants in this study are pregnant women in first trimester (week 1 - week 12) and in second trimester (week 13 – week 26), pregnant women with complications (such as: gestational diabetes and hypertension) and pregnant women with twin or triplet pregnancy.

5. WHAT WILL BE THE BENEFITS OF THE STUDY:

(a) TO YOU AS THE SUBJECT?

The benefits that can be obtained by participants are they will be able to understand what factrs that influence their dietary quality.

(b) TO THE INVESTIGATOR?

The benefits that can be obtained by the investigator are we will be able to identify whether demographic background, nutrition knowledge and physcosocial factors are significantly associate with dietary quality among pregnant women in Selangor.

6. WHAT ARE THE POSSIBLE RISKS?

There is no possible risk that may happen because this study will be conducted online

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

Yes. Every information that are given by the subjects will be remain confidential.

8. WHO SHOULD YOU CONTACT IF YOU HAVE ADDITIONAL QUESTIONS DURING THE COURSE OF THE RESEARCH?

Norfarzana Binti Mohd Noordin – 0132053946

Dr Nurzalinda Binti Zalbahar@Zabaha (supervisor) -0397692960 / nurzalinda@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)

Part C: Questionnaire

FACULTY OF MEDICINE AND HEALTH SCIENCES

FAKULTI PERUBATAN DAN SAINS KESIHATAN

DEPARTMENT OF DIETETICS

JABATAN DIETETIK

QUESTIONNAIRE / *BORANG SOAL SELIDIK*

RESEARCH TITLE / TAJUK KAJIAN:

FACTORS ASSOCIATED WITH DIETARY QUALITY AMONG PREGNANT WOMEN

FAKTOR- FAKTOR YANG MEMPENGARUHI KUALITI DIET DI KALANGAN IBU MENGANDUNG

RESEARCHER / *PENYELIDIK:* NORFARZANA BINTI MOHD NOORDIN (198802)

SUPERVISOR / *PENYELIA PENYELIDIK:* DR. NURZALINDA BINTI ZALBAHAR @ ZALBAHA

Instruction: The questions within this questionnaire are only for academic purposes. All the information will not be revealed to any parties. Your involvement and cooperation are much appreciated.

Arahan: Soalan di dalam borang soal selidik ini hanya untuk tujuan akademik sahaja. Sebarang maklumat tidak akan didedahkan ke mana-mana pihak. Penglibatan dan kerjasama anda amatlah dihargai.

Part A / Bahagian A

Fill in the blank or tick the boxes for the questions below.

Isikan tempat kosong atau tandakan bagi soalan di bawah.

No.	**Information / *Informasi***	**Options / *Pilihan***
1.	State of living *Menetap di negeri*	
2.	Age *Umur*	
3.	Ethnicity *Etnik*	( ) Malay / *Melayu* ( ) Chinese / *Cina* ( ) Indian / *India* ( ) Others / *Lain-lain* Please specify *Sila nyatakan*: …….

4.	Education level *Peringkat Pembelajaran*	( ) Non formal education / *pembelajaran tidak formal* ( ) Primary School / *Sekolah rendah* ( ) Secondary School / *Sekolah Menengah* ( ) Tertiary Education / *Pengajian Tinggi*
5.	Monthly household income *Pendapatan bulanan*	RM_____
6.	Trimester *Trimester kehamilan*	( ) First trimester; week 1 - week 12 Trimester pertama; minggu 1 - minggu 12 ( ) Second trimester; week 13 - week 26 Trimester ketiga; minggu 13 - minggu 26 ( ) Third trimester; week 27 and above Trimester ketiga; minggu 27 dan ke atas
7.	Presence of any diseases *Kehadiran penyakit*	( ) No / *Tidak* ( ) Yes / *Ya* If yes, please specify *Jika ya, sila nyatakan*: …….

Part B / Bahagian B

Circle the answer

Bulatkan pilihan jawapan

1. In the list below, the food with highest content of protein:
   Yang manakah mempunyai kandungan protein yang paling tinggi

a. Rice / *nasi*
b. Bread and biscuits / *roti dan biskut*
c. Fruits / *buah*
d. Fish / *ikan*
e. Do not know / *tidak tahu*

2. Among the food listed below, which one has the highest content of fiber
   Yang manakah mempunyai kandungan fiber yang paling tinggi

   a. Vegetables and beans / *sayur-sayuran dan kekacang*
   b. Milk and dairy products / *susu dan produk tenusu*
   c. Meat, chicken and duck / *daging lembu, ayam dan daging itik*
   d. Fish and seafood / *ikan dan makanan laut*
   e. Do not know / *tidak tahu*

3. The food that are rich in vitamin, mineral and fiber are
   Makanan yang tinggi dengan vitamin, mineral dan fiber adalah
   a. Meat, fish and chicken / *daging, ikan dan ayam*
   b. Vegetables and fruits / *sayur-sayuran dan buih*
   c. Fat, oil and sugar / *lemak, minyak dan gula*
   d. Rice, other cereals and tuber / *nasi, kanji dan ubi*
   e. Do not know / *tidak tahu*

4. Which one of the foods listed below contains the highest amount of cholesterol?
   Yang manakah mempunyai nilai kolesterol yang tinggi
   a. Durian / *durian*
   b. Coconut milk / *santan*
   c. Beef / *daging lembu*
   d. Mutton / *daging kambing*
   e. Egg yolk / *telur kuning*
   f. Do not know / *tidak tahu*

5. The food with a lot of salt
   Makanan yang tinggi garam

a. Soya sauce / *kicap*
b. Beef / *daging lembu*
c. Swamp cabbage / *kankung*
d. Canned soft drinks / *minuman bertin*
e. Do not know / *tidak tahu*

6. A balance diet has the following nutrients
   Diet yang seimbang mempunyai kandungan nutrien berikut
   a. Carbohydrate and fats / *karbohidrat dan lemak*
   b. Vitamin and minerals / *vitamin dan mineral*
   c. Carbohydrate, fat, protein and mineral / *karbohidrat, lemak, protein dan mineral*
   d. Do not know / *tidak tahu*

7. Do you know about food pyramid
   Adakah anda tahu mengenai piramid makanan
   a. Yes / *Ya*
   b. No / *Tidak*

   If yes, continue with question 8

   If no, directly go to question 10

8. According to the food pyramid, the food you know are advised to take the least
   Menurut piramid makanan, makanan yang digalakkan untuk mengambil dengan paling sedikit adalah
   a. Meat, fish and chicken / *daging, ikan dan ayam*
   b. Vegetables and fruits / *sayur-sayuran dan buah*
   c. Fat, oil and sugar / *lemak, minyak dan gula*
   d. Rice, other cereals and tubers / *nasi, kanji dan ubi*
   e. Do not know / *tidak tahu*

9. According to the food pyramid, the food that you can eat the most
   Menurut piramid makanan, makanan yang digalakkan untuk mengambil paling banyak adalah

a. Meat, fish and chicken / *daging, ikan dan ayam*
b. Vegetables and fruits / *sayur-sayuran dan buah*
c. Fats, oil and sugar / *lemak, minyak dan gula*
d. Rice, other cereal and tuber / *nasi, kanji dan ubi*
e. Do not know/ *tidak tahu*

10. The nutrient which will helps to build our body
Nutrien yang dapat membantu membina badan adalah
a. Protein / *protein*
b. Vitamin and mineral / *vitamin dan mineral*
c. Fat / *lemak*
d. Carbohydrate / *karbohidrat*
e. Do not know / *tidak tahu*

11. You can get all the required nutrient by
Anda boleh mendapatkan semua nutrien yang diperlukan dengan
a. Eating a lot of food / *makan banyak makanan*
b. Eating a lot of meat / *makan daging dengan banyak*
c. Eating a variety of food / *makan pelbagai jenis makanan*
d. Eating expensive food / *makan makanan mahal*
e. Do not know / *tidak tahu*

12. The nutrient that provides us with the most energy (calories)
Nutrien yang membekalkan kita dengan tenaga (kalori) paling banyak adalah
a. Protein / *protein*
b. Vitamin and minerals / *vitamin dan mineral*
c. Fat / *lemak*
d. Carbohydrate / *karbohidrat*
e. Do not know/ *tidak tahu*

13. In the list below, the food with highest carbohydrate contents
Yang manakah mempunyai kandungan karbohidrat yang paling banyak
a. Chicken / *ayam*

b. Bread / *roti*
c. Vegetables / *sayur-sayuran*
d. Fruits / *buah*
e. Do not know / *tidak tahu*

14. Body mass index is an indicator for
Indeks jisim badan merupakan penunjuk untuk
a. Body height status / *status tinggi badan*
b. Blood condition / *keadaan darah*
c. Condition of food intake / *pengambilan makanan*
d. Body weight status / *status berat badan*
e. Do not know / *tidak tahu*

15. Aerobic exercise (e.g; jogging, cycling, aerobic dance, fast walking and swimming) are importance for
Senaman aerobik (e.g; berjoging, berbasikal, menari aerobik, jalan secara laju dan
a. Strengthen the bone / *menguatkan tulang*
b. Digestion of food / *penghadaman makanan*
c. Beauty of the body / *kecantikan badan*
d. A healthy heart / *jantung yang sihat*
e. Do not know / *tidak tahu*

16. Over consumption of energy (calories) can lead to
Pengambilan tenaga (kalori) yang berlebihan akan menyebabkan
a. Skin disease / *sakit kulit*
b. Tuberculosis (T.B) / *batuk kering (tuberculosi)*
c. Obesity / *obesiti*
d. Dengue / *demam denggi*
e. Do not know / *tidak tahu*

17. In order to avoid obesity and maintain desirable body weight, we have to balance our food intake with

Bagi mengelakkan dari obesiti dan dapat memastikan berat badan unggul, kita kena seimbangkan pengambilan makanan dengan

a. Types of drink / *jenis makanan*
b. Our knowledge / *pengetahuan*
c. Physical activities / *aktiviti fizikal*
d. Our income / *pendapatan kita*
e. Do not know / *tidak tahu*

18. Which of the following ways of preparing food will increase the fat content
Cara masakan yang manakah dapat meningkatkan kandungan lemak dalam makanan

a. Steam / *kukus*
b. Fry / *goreng*
c. Roast / *panggang*
d. Boil / *rebus*
e. Do not know / *tidak tahu*

19. Obesity will increase risk to the following disease
Obesiti dapat meningkat risiko kepada penyakit berikut

a. Malaria / *malaria*
b. Heart disease / *penyakit jantung*
c. Tuberculosis (T.B) / *batuk kering (tuberculosis)*
d. Dengue / *demam denggi*
e. Do not know / *tidak tahu*

20. The risk of consuming food with excessive sugar is
Pengambilan gula yang berlebihan dapat meningkatkan risiko

a. Skin disease / *penyakit kulit*
b. Tuberculosis (T.B) / *batuk kering (tuberculosis)*
c. High blood pressure / *darah tinggi*
d. Diabetes mellitus / *kencing manis*
e. Do not know / tidak tahu

21. Arrange the following foods according to their cholesterol content by filling in the number 1, 2, 3, 4 and 5 in the boxes provided. No 1 is the highest cholesterol content and no 5 is the lowest cholesterol content.

    Each number can be used once

    Susun senarai makanan di bawah mengikut kandungan kolesterol dalam makanan dengan mengisi nombor 1,2,3,4 dan 5 di dalam kotak yang disediakan. Nombor 1 adalah makanan yang paling tinggi kolesterol dan nombor 5 adalah makanan paling rendah kolesterol

    Setiap nombor hanya boleh digunakan sekali sahaja

Fish, cheese, milk / *ikan, keju, susu*	
Prawn, cuttlefish, butter / *udang, sotong, mentega*	
Chicken, beef, mutton / *ayam, daging lembu, daging kambing*	
Brain, liver, egg yolk / *otak, hati, telur kuning*	
Coconut oil, coconut milk / *minyak kelapa, santan*	

Part C / Bahagian C

Circle of the relevant answer

Bulatkan pilihan yang berkenaan

0 = Never / *tidak pernah*

1 = Almost Never / *hampir tidak pernah*

2 = Sometimes / *kadang kala*

3 = Fairly Often / *kerap*

4 = Very Often / *sangat kerap*

1. In the last month, how often have you been upset because of something that	

happened unexpectedly? *Pada bulan yang lepas, berapa kerap anda rasa sedih kerana sesuatu yang berlaku di luar kawalan?*	0	1	2	3	4
2. In the last month, how often have you felt that you were unable to control the important things in your life? *Pada bulan yang lepas, berapa kerap anda rasa anda tidak mampu untuk mengawal benda yang penting dalam hidup anda?*	0	1	2	3	4
3. In the last month, how often have you felt nervous and "stressed"? *Pada bulan yang lepas, berapa kerap anda rasa gementar dan stres?*	0	1	2	3	4
4. In the last month, how often have you felt confident about your ability to handle your personal problems? *Pada bulan yang lepas, berapa kerap anda rasa yakin mengenai kebolehan anda dalam mengendalikan masalah peribadi?*	0	1	2	3	4
5. In the last month, how often have you felt that things were going your way? *Pada bulan yang lepas, berapa kerap anda rasa semuanya mengikut perancangan anda?*	0	1	2	3	4
6. In the last month, how often have you found that you could not cope with all the things that you had to do? *Pada bulan yang lepas, berapa kerap anda mengetahui bahawa anda tidak boleh mengendalikan dengan segala perkara yang anda perlu lakukakan?*	0	1	2	3	4
7. In the last month, how often have you been able to control irritations in your life? *Pada bulan yang lepas, berapa kerap anda mampu untuk mengawal kejengkelan dalam kehidupan?*	0	1	2	3	4
8. In the last month, how often have you felt that you were on top of things? *Pada bulan yang lepas, berapa kerap anda rasa anda boleh mengendalikan segalanya?*	0	1	2	3	4
9. In the last month, how often have you been angered because of things that were outside of your control? *Pada bulan yang lepas, berapa kerap anda rasa marah kerana perkara di luar kawalan anda?*	0	1	2	3	4
10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them? *Pada bulan yang lepas, berapa kerap anda rasa terlalu banyak kesulitan sehingga tahap anda tidak mampu untuk menanganinya lagi?*	0	1	2	3	4

Part D / Bahagian D

Please check the answer that comes closest to how you have felt in **the past 7 days**, not just how you feel today

*Tandakan pada kotak yang berkenaan. Responden hendaklah mengambil kira **dari 7 hari yang lepas**, bukan pada hari ini sahaja.*

In the past 7 days / *Dalam masa 7 hari ini*:

1. I have been able to laugh and see the funny side of things /
Saya mampu untuk gelak dan lihat perkara dari sudut yang gembira

- ❑ As much as i always could / *Sebanyak mana yang saya mahu*
- ❑ Not quite so much now / *Tidak berapa banyak sekarang*
- ❑ Definitely not so much now / *Tidak banyak*
- ❑ Not at all / *Tidak langsung*

2. I have looked forward with enjoyment to things
Saya ternanti-nantikan perkara yang penuh dengan keseronokan

- ❑ As much as I ever did / *Sangat menantikan*
- ❑ Rather less than I used to / *Lebih sedikit dari yang dulu*
- ❑ Definitely less than I used to / *Sangat sikit berbanding dahulu*
- ❑ Hardly at all / *Sangat susah untuk merasakan*

3. I have blamed myself unnecessarily when things
Saya menyalahkan diri saya di atas perkara yang tidak sepatutnya

- ❑ Yes, most of the time / *Ya, pada kebanyakan waktu*
- ❑ Yes, some of the time / *Ya, kadang kala*
- ❑ Not very often / *Tidak selalu*
- ❑ No, never / *Tidak pernah*

4. I have been anxious or worried for no good reason
Saya pernah berasa gusar dan bimbang tanpa sebab

- ❑ No, not at all / *Tidak, tidak pernah langsung*
- ❑ Hardly ever / *Tidak*
- ❑ Yes, sometimes / *Ya, kadangkala*
- ❑ Yes, very often / *Ya, sangat kerap*

5. I have felt scared or panicky for no very good reason
Saya berasa takut dan panik tanpa sebab

- ❑ Yes, quite a lot / *Ya, agak kerap*
- ❑ Yes, sometimes / *Ya, kadangkala*
- ❑ No, not much / *Tidak, tidak selalu*
- ❑ No, not at all / *Tidak, tidak pernah langsung*

6. Things have been getting on top of me
Keadaan jadi makin sukar sejak kebelakangan ni

- ❑ Yes, most of the time I haven't been able / *Ya, kebanyakan waktu*
- ❑ Yes, sometimes I haven't been coping as well / *Ya, kadangkala*
- ❑ No, most of the time I have coped quite well / *Tidak, kebanyakan waktu saya dapat mengendalikannya dengan baik*
- ❑ No, I have been coping as well as ever / *Tidak, saya dapat mengendalikannya dengan baik*

7. I have been so unhappy that I have had difficulty sleeping
Saya berasa sangat tidak gembira sehingga saya merasa sukar untuk tidur

- ❑ Yes, most of the time / *Ya, kebanyakan waktu*
- ❑ Yes, sometimes / *Ya, kadang kala*
- ❑ Not very often / *Tidak berapa kerap*
- ❑ No, not at all / *Tidak, tidak pernah*

8. I have felt sad or miserable

Saya berasa sedih atau serabut

- ❑ Yes, most of the time / *Ya, sangat kerap*
- ❑ Yes, quite often / *Ya. agak kerap*
- ❑ Not very often / *Kadang kala*
- ❑ No, not at all / *Tidak langsung*

9. I have been so unhappy that I have been crying

Saya berasa sangat tidak gembira hingga saya menangis

- ❑ Yes, most of the time / *Ya, sangat kerap*
- ❑ Yes, quite often / *Ya, agak kerap*
- ❑ Only occasionally / *Hanya pada keadaan tertentu*
- ❑ No, never / *Tidak, tidak pernah*

10. The thought of harming myself has occurred to me

Saya pernah terfikir untuk mencederakan diri sendiri

- ❑ Yes, quite often / *Ya, sangat kerap*
- ❑ Sometimes / *Kadangkala*
- ❑ Hardly ever / *Tidak*
- ❑ Never / *Tidak*

Part E / Bahagian E

Please circle the answer that comes closest to how you have felt **in the past 7 days**, not just how you feel today

*Bulatkan pada nombor yang berkenaan. Responden hendaklah mengambil kira **dari 7 hari yang lepas**, bukan pada hari ini sahaja.*

1 = Very Strongly Disagree / *Teramat tidak setuju*

2 = Strongly Disagree / *Sangat tidak setuju*

3 = Mildly Disagree / *Tidak setuju*

4 = Neutral / *Neutral*

5 = Mildly Agree / *Setuju*

6 = Strongly Agree / *Sangat setuju*

7= Very Strongly Agree / *Teramat setuju*

1.There is a special person who is around when I am in need *Saya ada seseorang yang spesial buat saya dan orang itu sentiasa ada ketika saya perlukan dia*	0	1	2	3	4	5	6	7
2. There is a special person with whom I can share joys and sorrows / *Saya ada seseorang yang spesial di mana saya boleh kongsi kegembiraan dan kesedihan bersamanya*	0	1	2	3	4	5	6	7
3. My family really tries to help me / *Keluarga saya cuba untuk membantu saya*	0	1	2	3	4	5	6	7
4. I get the emotional help & support I need from my family / *Saya dapat bantuan emosi dan sokongan yang saya perlukan dari keluarga*	0	1	2	3	4	5	6	7
5. I have a special person who is a real source of comfort to me / *Saya ada seseorang yang spesial buat saya dan orang itu sentiasa buat saya selesa bersamanya*	0	1	2	3	4	5	6	7
6. My friends really try to help me / *Rakan - rakan saya cuba untuk membantu saya*	0	1	2	3	4	5	6	7
7. I can count on my friends when things go wrong / *Saya boleh bergantung pada rakan - rakan jika ada sesuatu berlaku*	0	1	2	3	4	5	6	7
8. I can talk about my problems with my family / *Saya boleh berbincang mengenai masalah saya dengan ahli keluarga*	0	1	2	3	4	5	6	7
9. I have friends with whom I can share my joys and sorrows / *Saya mempunyai rakan yang saya boleh berkongsi kegembiraan dan kesedihan*	0	1	2	3	4	5	6	7
10. There is a special person in my life who cares about my feelings / *Saya mempunyai seseorang yang spesial buat saya dan orang mengambil berat akan perasaan saya*	0	1	2	3	4	5	6	7
11. My family is willing to help me make decisions / *Keluarga saya*	0	1	2	3	4	5	6	7

sanggup untul membantu saya membuat keputusan	
12. I can talk about my problems with my friends / *Saya boleh menceritakan masalah saya kepada rakan - rakan*	0 1 2 3 4 5 6 7

Part F: Food Frequency Questionnaire

In this section, you will be asked questions on whether you have eaten or not the type of foods listed. Write down numbers in the column how many times were consumed whether **Daily**, **Weekly**, or **Monthly**. How many times each serving were taken refers to how many of those foods were eaten by the respondents for each time. For example, if you eat papaya, you will be asked how many slices of papaya were taken each time. If you answered 2 slices, fill in "2" in the answer space. This is because each serving equals one slice of papaya.

Dalam bahagian ini, anda akan ditanya jika anda ada mengambil makanan yang disenaraikan atau tidak. Catatkan berapa kali anda mengambil makanan tersebut dalam ruangan yang disediakan mengikut kadar pengambilan anda sama ada harian, mingguan atau bulanan. Berapa kali makanan diambil itu bermaksud berapa banyak anda makan bagi satu satu hidangan. Contohnya, jika anda memakan betik, anda akan ditanya berapa potong betik anda makan pada satu masa. Jika anda memakan 2 potong betik, isikan 2 di ruangan yang disediakan.

No.	**Type of food** *Jenis makanan*	**How frequent each food was taken /** *Kekerapan makanan* ***(Fill in one of the columns only)*** *(Isi salah satu kotak sahaja)*			**Reference of meal size** *Panduan saiz makanan*	**Total servings (each time eaten)** *Jumlah hidangan dimakan*
		Daily *Harian*	**Weekly** *Mingguan*	**Monthly** *Bulanan*		
A. Cereals and cereals product / *Bijian dan produk bijian*						
1	White rice / *nasi putih*				cup / *cawan*	

2	Brown rice / *nasi perang*				cup / *cawan*	
3	Flavoured rice / *nasi berperisa*				cup / *cawan*	
4	Rice porridge / *bubur nasi*				cup / *cawan*	
5	Glutinous rice / *pulut*				cup / *cawan*	
6	Noodles / *mi*				cup / *cawan*	
7	Mihun/ Kueh teow/ laksa/ laksam/ loh shi fun				cup / cawan	
8	Pasta				cup / *cawan*	
9	Sago/ambuyat/linut				cup / *cawan*	
10	Bread / *roti*				slices / *keping*	
11	Wholemeal bread / *roti gandum*				slices / *keping*	
12	Bread bun / *bun roti*				pieces / *ketul*	
13	Roti Canai (includes roti telur, roti sardine, roti bawang, roti pisang, murtabak)				slices / *keping*	
14	Capati				slices / *keping*	

15	Tosai				slices / keping	
16	Breakfast cereals / *bijiran*				cup / *cawan*	
17	Cereal grains prepared with water / *bijiran yang disediakan dengan air*				cup / *cawan*	
18	Corn / *jagung*				piece / *tongkol*	
B. Fast food / *Makanan segera*						
19	Burger				pieces / *ketul*	
20	Fried Chicken / *ayam goreng*				pieces / *ketul*	
21	Pizza				slices / *keping*	
22	French Fries / *kentang goreng*				medium size / *saiz medium*	

B. Fast food / *Makanan segera*						
23	Mashed Potatoes / *kentang lenyek*				small container/ *bekas kecil*	

24	Coleslaw				small container / *bekas kecil*	
25	Sausage/Hotdog/Frankfurter				slices / *keping*	
26	Nugget				pieces / *ketul*	
C. Meat and meat product (*For non-Muslim only) / *Daging dan produk daging (*untuk bukan muslim*						
27	Chicken / *ayam*				Pieces / *ketul*	
28	Quail / *puyuh*				whole / *ketul*	
29	Duck / *itik*				pieces / *ketul*	
30	Meat / *daging*				matchbox size / *kotak mancis*	
31	Mutton / *daging kambing*				matchbox size / *kotak mancis*	
32	Internal organs (liver, spleen, lungs) / *organ dalaman (hati, limpa, paru)*				matchbox size / *kotak mancis*	
33	Chicken/ meatball				pieces / *ketul*	
34	*Ham				slices / *keping*	

35	*Bacon				slices / *keping*	
36	*Luncheon meat				slices / *keping*	
37	*Pork				matchbox size / *kotak mancis*	
D. Fish and seafoods / *Ikan dan makanan laut*						
38	Marine fish /				whole	
39	Freshwater fish / *ikan air tawar*				whole / *ketul*	
40	Prawn / *udang*				whole / *ketul*	
41	Squid / *sotong*				whole / *ketul*	
42	Canned fish / *ikan dalam tin*				whole / *ketul*	
43	Crab / *ketam*				whole / *ketul*	
44	Anchovy / *ikan bilis*				tablespoon / sudu makan	
45	Shellfish / *kerang*				tablespoon / *sudu makan*	

46	Snail / *siput*				tablespoon / *sudu makan*	
47	Pickled fish / *jeruk ikan*				pieces / *ketul*	
48	Dried squid / *sotong kering*				pieces / *ketul*	
49	Fish / prawn / squid / crab crackers *Keropok ikan / udang / ketam*				slices / *keping*	
50	Keropok lekor				slices / *keping*	
51	Fish/prawn/squid/crab ball or cake *Kek ikan / udang / sotong / ketam*				pieces / *ketul*	
52	Dried fish / *ikan kering*				whole / *ketul*	
	E. Eggs / *Telur*					
53	Hen eggs / *telur ayam*				pieces / *ketul*	
54	Duck eggs / *telur itik*				pieces / *ketul*	

55	Quail eggs / *telur puyuh*				pieces / *ketul*	
56	Salted egg / *telur masin*				pieces / *ketul*	
F. Legumes and legumes product / *Kekacang dan produk kekacang*						
57	Legumes / *kekacang*				tablespoon / *sudu makanan*	
58	Groundnuts / *kacang tanah*				tablespoon / *sudu makan*	
59	Taufufa				tablespoon / *sudu makan*	
60	Tauhu				slices / *keping*	
61	Fermented soy beans/ *tempe*				slices / *keping*	
G. Milk and milk products / *Susu dan produk tenusu*						
62	Fresh milk / *susu segar*				cup / *cawan*	
63	Commercial milk / *susu komersial*				cup / *cawan*	
64	Yogurt/lassi/curd				cup / *cawan*	
65	Powdered milk / *susu tepung*				tablespoon / *sudu makan*	

66	Evaporated milk / *susu sejat*				tablespoon / *sudu makan*	
67	Cheese				slices / *keping*	
H. Vegetables / *sayur- sayuran*						
68	Leaf green vegetables / *sayuran hijau*				tablespoon / *sudu makan*	
69	Ladies finger / *bendi*				tablespoon / *sudu makan*	
70	Other type of legumes / *kekacang jenis lain*				tablespoon / *sudu makan*	
71	Bean sprout / *taugeh*				tablespoon / *sudu makan*	
72	Tubers (potatoes, sweet potatoes, yam) / ubi (ubi keledek, keladi)				tablespoon / *sudu makan*	
73	Cabbages / *kobis*				tablespoon / *sudu makan*	
74	Chilies / *cili*				tablespoon / *sudu makan*	

H. Vegetables / *sayur - sayuran*						
75	Tomatoes / *tomato*				tablespoon / *sudu makan*	
76	Brinjal / terung				tablespoon / *tablespoon*	
77	Fruit vegetables (Luffa/pumpkin/cucumber/baby corn) *Luffa / labu / timun / jagung muda*				tablespoon / *sudu makan*	
78	Salted or dried vegetables / *sayur kering atau sayur masin*				tablespoon / *sudu makan*	
79	Local fresh salads / *salad segar tempatan*				tablespoon / *sudu makan*	
80	Mushrooms / *cendawan*				tablespoon / *sudu makan*	
81	Dried mushrooms / *cendawan kering*				tablespoon / *sudu makan*	
I. Fruits / *Buah - buahan*						
82	Papaya / *betik*				slices / *potong*	

83	Mango / *manga*				slices / *potong*	
84	Pineapple / *nenas*				slices / *potong*	
85	Watermelon / *tembikai*				slices / *potong*	
86	Dragon fruit / *buah naga*				slices / *potong*	
87	Honey dew / *tembikai susu*				slices / *potong*	
88	Rock Melon				slices / *potong*	
89	Guava / *jambu batu*				slices / *potong*	
90	Water apple / *jambu air*				piece / ketul	
91	Lime / *limau*				piece / *ketul*	
92	Banana / *pisang*				piece / *ketul*	
93	Starfruit / *belimbing*				piece / potong	
94	Apple / *epal*				piece / *ketul*	
95	Orange / *oren*				piece / *ketul*	

96	Pear				piece / *ketul*	
97	Grape / *anggur*				piece / *ketul*	
98	Rambutan				piece / *ketul*	
99	Longan				piece / *ketul*	
100	Lychee / *laici*				piece / *ketul*	
101	Mangosteen / *manggis*				piece / *ketul*	
102	Durian				piece/ *ketul*	
103	Jackfruit / *nangka*				piece/ *ketul*	
104	Canned fruits / *buah dalam tin*				tablespoon / *sudu makan*	
105	Dried fruits / *buah kering*				tablespoon / *sudu makan*	
106	Pickled fruits / *jeruk buah*				tablespoon / *sudu makan*	

107	Young coconut / *kelapa muda*				tablespoon / *sudu makan*	

J. Drinks / *Minuman*						
108	Plain water / *air kosong*				cup / *cawan*	
109	Tea / *teh*				cup / *cawan*	
110	Coffee / *kopi*				cup / *cawan*	
111	Chocolate drink / *air coklat*				cup / *cawan*	
112	Malted drink (e.g; milo) / *minuman malt*				cup / *cawan*	
113	Pre-mixed drinks / *air campuran*				cup / *cawan*	
114	Ready-to-drink drinks / *minuman sedia diminum*				cup / *cawan*	
115	Cordial syrup / *kordial sirap*				cup / *cawan*	
116	Fruit juice / *jus buah*				cup / *cawan*	
117	Carbonated drinks (includes isotonic) / *air*				cup / *cawan*	

	bergas (termasuk minuman isotonik)					
118	Soy milk / *susu soya*				cup / *cawan*	
119	Herbal/botanical drinks (pre-mixed) *Air herba/botanik (campuran)*				cup / *cawan*	
120	Herbal/botanical drinks (ready-to-drink) *Air herba / botanik (minuman sedia diminum)*				cup / *cawan*	
121	Herbal/botanical brewed drinks *Air herba / botanik (dibancuh)*				cup / *cawan*	
122	Energy drinks / *minuman tenaga*				cup / *cawan*	
123	Yoghurt drinks / *air yogurt*				cup / *cawan*	
K. Alcoholic drinks *(For non-Muslim only)* / *Minuman beralkohol (untuk bukan muslim)*						
124	Shandy				glass	
125	Beer/lager/ale/stout				glass	
126	Todi (Palm wine)				glass	

127	Wine/cider/champagne/ peri				glass	
128	Rice wine/lihing				glass	
129	Brandi/rum/whiskey/ vodka/samsu/sam cheng/montoku/langkau				glass	
L. Confectionaries / *Manisan*						
130	Local kuih / *kuih tempatan*				pieces / *ketul*	
131	Sweets / *Gula - gula*				pieces / *ketul*	
132	Chocolate bar / *bar coklat*				small size / *saiz kecil* 40g	
133	Cake / *kek*				pieces / *ketul*	
L. Confectionaries / *Manisan*						
134	Jelly/ custard *Jeli / kastard*				pieces / *ketul*	
135	Lolly ice / *ais krim batang*				pieces / *batang*	
136	Ice cream / *ais krim*				pieces / *ketul*	
137	ABC/Ice blended				cup / *cawan*	

138	Cream crackers / *biskut berkrim*				pieces / *keping*	
139	Flavoured/cream/ filled cookies *Biskut berperisa / berkrim / berinti*				pieces / *keping*	
140	Pastry (Pie, croissant)				pieces / *ketul*	
141	Snacks/crackers *Snek / keropok*				pieces / *ketul*	
M. Bread spread						
142	Jam / *jem*				teaspoon /*sudu teh*	
143	Kaya (coconut jam) / *kaya (perisa kelapa)*				teaspoon / *sudu teh*	
144	Butter / *mentega*				teaspoon / *sudu teh*	
145	Margarine / *majerin*				teaspoon / *sudu teh*	
146	Peanut butter / *mentega kacang*				teaspoon / *sudu teh*	
147	Cream cheese / *krim keju*				teaspoon / *sudu teh*	
148	Chocolate spread / *coklat*				teaspoon / *sudu teh*	

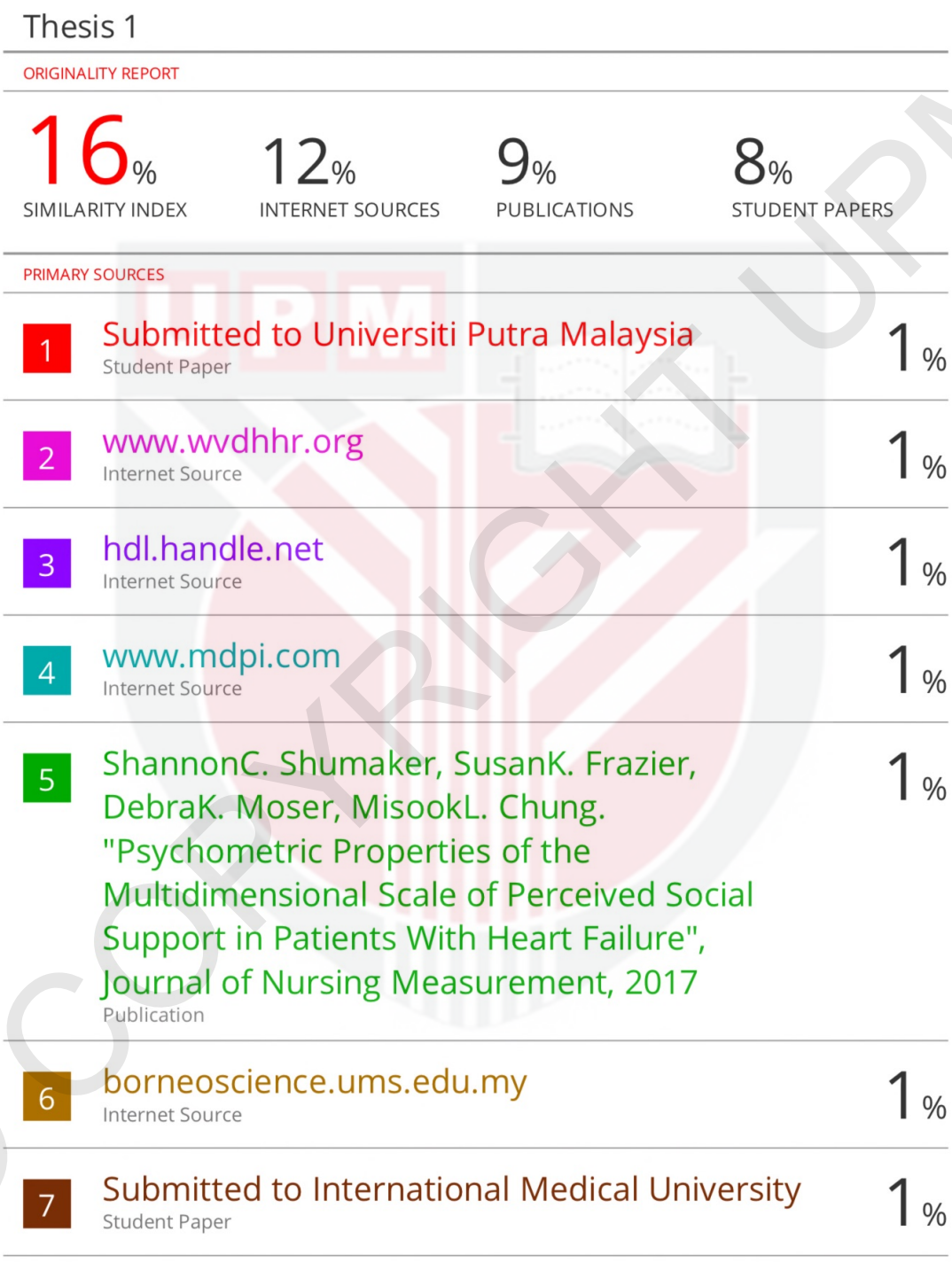
149	Garlic spread				teaspoon / *sudu teh*	
N. Flavours / *Perisa*						
150	Sugar (white, brown, Melaka) *Gula (putih, perang, Melaka)*				teaspoon / *sudu teh*	
151	Honey / *madu*				teaspoon/ *sudu teh*	
152	Condensed milk (creamer) / *Susu sejat (krimer)*				tablespoon / *sudu makan*	
153	Condiment / *serbuk perasa*				teaspoon/ *sudu teh*	
154	Pickle / *Jeruk*				teaspoon/ *sudu teh*	
155	Shrimp paste / *belacan*				teaspoon/ *sudu teh*	
156	Budu				teaspoon/ *sudu teh*	
157	Cencalok				teaspoon/ *sudu teh*	
158	Soy sauce / *kicap*				teaspoon/ *sudu teh*	
159	Chili sauce / *sos cili*				teaspoon/ *sudu teh*	

160	Tomato ketchup / *sos tomato*				teaspoon/ *sudu teh*	
161	Oyster sauce / *sos tiram*				teaspoon/ *sudu teh*	
162	Fish sauce / *sos ikan*				teaspoon/ *sudu teh*	
163	Petis/heko/otak udang				teaspoon/ *sudu teh*	
164	Chili flakes				teaspoon/ *sudu teh*	
165	Salad dressing				teaspoon/ *sudu teh*	

END OF THE QUESTIONNAIRE

THANK YOU FOR YOUR PATIENCE AND COOPERATION!

Part D: Turnitin report



Thesis 1

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