



UNIVERSITI PUTRA MALAYSIA

***ASSOCIATIONS OF SOCIO-DEMOGRAPHIC
CHARACTERISTICS, PSYCHOLOGICAL FACTORS AND
LIFESTYLE FACTORS WITH ACADEMIC PERFORMANCE
AMONG UNDERGRADUATE STUDENTS IN SELANGOR***

LIM HOOI SIAN

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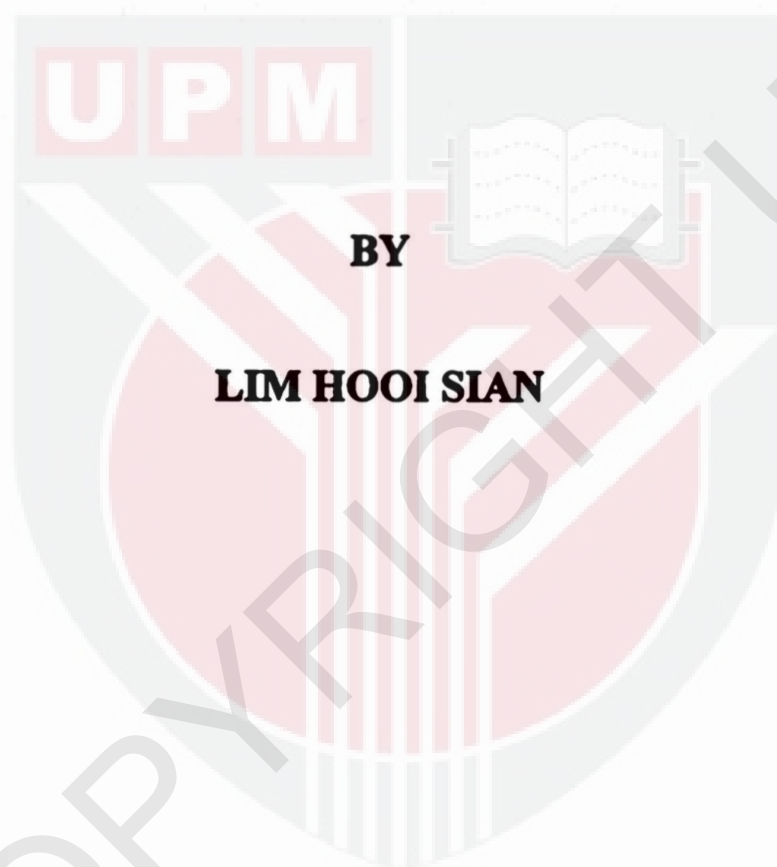
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BY

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ABSTRACT

ASSOCIATIONS OF SOCIO-DEMOGRAPHIC CHARACTERISTICS, PSYCHOLOGICAL FACTORS AND LIFESTYLE FACTORS WITH ACADEMIC PERFORMANCE AMONG UNDERGRADUATE STUDENTS IN SELANGOR

LIM HOOI SIAN

Academic performance can be defined as the extent to which a student has achieved certain goals in their studies. Undergraduate students experienced various challenges especially educational, social, lifestyle changes that will affect their academic performance and future career success. However, there are limited studies on academic performance among undergraduate students in Malaysia. Therefore, this cross-sectional study aimed to examine the associations of socio-demographic characteristics, psychological factors and lifestyle factors with academic performance among undergraduate students in selected universities in Selangor. A total of 265 undergraduate students (66.4% females and 33.6% males) completed a set of self-administered questionnaire while anthropometric measurements were measured by the researcher. The results found that 50.6% of the undergraduate students were classified as second upper class honour for their academic performance. Year of study ($\chi^2=18.599$, $p=0.029$), severity of depression ($\chi^2=111.197$, $p<0.001$), anxiety ($\chi^2=109.672$, $p<0.001$) and stress ($\chi^2=97.490$, $p<0.001$) and breakfast skipping ($\chi^2=9.046$, $p=0.029$) were associated with poorer academic performance. High self-esteem ($\chi^2=48.542$, $p<0.001$), better sleep quality ($\chi^2=68.086$, $p<0.001$), and high physical activity level ($\chi^2=14.260$, $p=0.027$) were associated with better academic outcome. No associations were found between sex, accommodation, monthly household income, parental education, fast food consumption, body mass index and academic performance. In conclusion, psychological distress and unhealthy lifestyles (high anxiety level, poor sleep quality and low physical activity level) were associated with poor academic performance. Further prospective cohort study is needed to understand how these factors influence one's academic performance.

ABSTRAK

PERHUBUNGAN ANTARA FAKTOR SOSIO-DEMOGRAFI, FAKTOR PSIKOLOGIKAL DAN FAKTOR CARA KEHIDUPAN DENGAN PRESTASI AKADEMIK DALAM KALANGAN PELAJAR UNIVERSITI DI SELANGOR

LIM HOOI SIAN

Prestasi akademik dapat didefinisikan sebagai sejauh mana seorang pelajar telah mencapai matlamat tertentu dalam pelajaran mereka. Pelajar universiti mengalami pelbagai cabaran terutamanya pendidikan, sosial, perubahan gaya hidup yang akan mempengaruhi prestasi akademik mereka dan kejayaan kerjaya masa depan. Walau bagaimanapun, terdapat kajian terhad mengenai prestasi akademik dalam kalangan pelajar universiti di Malaysia. Oleh itu, kajian ini bertujuan untuk mengkaji perhubungan antara faktor sosio-demografi, faktor psikologikal dan faktor gaya hidup dengan prestasi akademik dalam kalangan pelajar universiti di Selangor. Sejumlah 265 pelajar universiti (66.4% perempuan dan 33.6% lelaki) telah menyelesaikan satu set soal selidik manakala pengukuran badan diukur oleh penyelidik. Kajian ini mendapati bahawa 50.6% pelajar sarjana diklasifikasikan sebagai *Second Upper Class Honour* untuk prestasi akademik mereka. Tahun pengajian ($\chi^2=18.599$, $p=0.029$), kemurungan ($\chi^2=111.197$, $p<0.001$), kebimbangan ($\chi^2=109.672$, $p<0.001$) dan tekanan ($\chi^2=97.490$, $p<0.001$) yang tinggi dan tidak mengambil sarapan ($\chi^2=9.046$, $p=0.029$) dikaitkan dengan prestasi akademik yang lebih lemah. Harga diri yang tinggi ($\chi^2=48.542$, $p<0.001$), kualiti tidur yang lebih baik ($\chi^2=68.086$, $p<0.001$) dan tahap aktiviti fizikal yang tinggi ($\chi^2=14.260$, $p=0.027$) juga dikaitkan dengan akademik yang lebih baik. Tiada perhubungan ditemui antara jantina, penginapan, pendapatan isi rumah bulanan, pendidikan ibu bapa, pengambilan makanan segera, indeks jisim tubuh dan prestasi akademik. Kesimpulannya, tekanan psikologi dan gaya hidup yang tidak sihat (tahap kebimbangan yang tinggi, kualiti tidur yang lemah dan tahap aktiviti fizikal yang rendah) dikaitkan dengan prestasi akademik yang lemah. Kajian prospektif kohort diperlukan untuk memahami bagaimana faktor-faktor ini dapat mempengaruhi prestasi akademik seseorang pelajar pada masa depan.

CHAPTER 1

INTRODUCTION

1.1 Background of Study

According to Ministry of Education Malaysia (2016), there are 20 public universities in Malaysia. The total number of people enrolled is approximately 540,638. However, the majority of students are from undergraduates which contribute around 78.0%. An undergraduate is a student who is studying for their first degree at a college/university. University is a time when students experienced different types of challenges related to their education, social, and lifestyle changes that can have both positive and negative impacts on student health. It may influence their academic performance, which will influence future educational attainment and income.

Academic performance of undergraduate students has been found to have an effect on their future career success (Rehman, Zafar, Mohib, Hussain, & Ali, 2018). Academic performance is one of the most vital considerations among students in tertiary education. Academic performance can be illustrated by grade point average (GPA) (Siraj et al., 2014). Academic performance also indicates the extent to which a student has accomplished specific goals in their studies. It is mainly focus on cognitive domain which includes the acquisition of knowledge and developing of intellectual skills (Elmagd, Mossa, Sami, El-marsafawy, & Jadaan, 2015). There are several determining factors related to academic

performance such as stress, anxiety, depression, eating behaviors, sleep quality and social influences, which are important to both universities and their undergraduates (Deliens, Clarys, Bourdeaudhuij, & Deforche, 2014).

Poor academic performance associated with increasing the emotional disturbances such as depression, anxiety and stress (Teh, Ngo, Zulkifli, Vellasamy, & Suresh, 2015). Poor academic lead to feelings of helplessness and thus produce stress and anxiety. A study in Malaysia reported that the prevalence for moderate depression, anxiety and stress among undergraduate students were 30.7%, 55.5%, and 16.6% respectively (Teh et al., 2015). The study explained that poor academic performance may lead to depression, anxiety and stress that pervades the life of students and tends to affect their mental health (Kumari & Garita, 2012). Unfamiliarity with academic procedures and demands during the transition stage may increase the risk of psychological distress (Elias, Ping, & Abdullah, 2011).

Academic performance is an important predictor of various outcomes including self-esteem and behavior. Self-esteem is a person's inner appreciation or assessment of him/herself. Having high self-esteem is the core of human's psychological structure which can lead to many different positive outcomes (Bahrami & Bahrami, 2015). Students with poorer academic view themselves as incapable person to achieve their goals. Increase in academic performance has been proven as the best way to improve student self-esteem (Aryana, 2010). However, low self-esteem can be seen as a major factor in abuse, addiction, crime, depression, loneliness, low educational achievement and mental illness (Bhagat,

2016). It also indicated that good academic performance leads to higher self-esteem (Arshad, Muhammad, & Mahmood, 2015).

Poor academic performance among undergraduate students has been also identified as one of the reasons that caused poor sleep quality (Kamel, Desouky, Lawend, Abu, & Awed, 2015). Undergraduate students with poor academic tend to sacrifice their sleep and thus contributing to poor sleeping habits. Academic performance have all been proven to negatively affect sleep quality including short sleep duration, irregular sleep schedules, and sleep deprivation (Raley, Naber, Cross, & Perlow, 2016). Sleep helps the brain to repair, learning or memory consolidation, and restorative processes. In addition, sleep also helps brain to integrate new knowledge and forms associations. (Alhazzani, Masudi, & Algarni, 2018). Studies have indicated that over 60% of undergraduate students were poor quality sleepers. Most of them are having daytime sleepiness, inattentiveness and increase of physical and psychological health problems (Ahrberg, Dresler, Niedermaier, Steiger, & Genzel, 2012).

1.2 Problem Statement

There were a few studies examined on the factors associated with academic performance. From the findings of previous studies, the possible factors that could associate with academic performance, including socio-demographic characteristics, psychological factors (depression, anxiety, stress and self-esteem) and lifestyle factors (sleep quality, physical activity, eating behavior and body weight status).

Many studies were conducted to assess the associations of depression, anxiety and stress with academic performance among undergraduate students and it is found that depression, anxiety and stress affects students' academic performance. Depression, anxiety and stress were associated with students daily life and influence their academic (Sharma & Pandey, 2017). A high level of stress may have negative effect on cognitive functioning and learning of students (Sohail, 2016). However, there were some inconsistencies with the findings in the previous literature as stress was not shown significant to academic performance (Kumari & Garita, 2012). A study found that there was a significant, but weak and negative associations between stress and academic performance (Elias, Ping, & Abdullah, 2011). One of the studies from Pakistan reported that no significant relationship between stress and academic performance as students have master knowledge of the course and tend to reduce stress towards the end of the semester and did not affect academic (Farhan, 2015). A study in Universiti Kebangsaan Malaysia (UKM) demonstrated that students with a high and severe level of stress were able to do well as stress motivated them towards a better academic performance (Siraj et al., 2014). Due to the controversial findings, future related research is encouraged to be conducted in Malaysia to discover the associations of depression, anxiety and stress with academic performance among undergraduate students.

Several studies have been conducted to study the relationship between self-esteem and academic performance but it is difficult to make a conclusion from these studies due to the inconsistency of the results (Bahrami & Bahrami,

2015). According to Maslow's theory of hierarchical needs, self-esteem can be considered as a need for humans. Self-esteem is created and developed in effect of variety of factors. Most of the studies demonstrated that there was a positive relationship between self-esteem and academic performance (Aryana, 2010). A study from India showed that academic performance was influenced by self-esteem (Bhagat, 2016). This was supported by another study conducted in Universiti Kebangsaan Malaysia (UKM). They reported that higher self-esteem perform better in their academic. Students with high academic performance tend to feel more confident compared to those who lack of confidence (Rosli et al., 2012). However, two studies conducted in Universiti Teknologi MARA Shah Alam and Universiti Putra Malaysia (UPM) revealed controversial findings. The finding stated there was no significant correlation between the self-esteem level and CGPA. These inconsistencies in finding could be due to the differences in study design and also the measures of self-esteem used in these studies (Ahmat, Muda, & Neoh, 2018). Self-esteem assessments depended exclusively on self-report and might lead to bias (Naderi, Rohani, Tengku, & Jamaluddin, 2009).

Previous studies suggested that sleep quality and quantity are linked with students' learning abilities and academic performance. Sleep is critical for memory consolidation, learning, decision making, and critical thinking (Kamel, Desouky, Lawend, Abu, & Awed, 2015). Sleep is also essential to maintain mood, motivation and cognitive performance (Baert, Omeij, Verhaest, & Vermeir, 2015). Poor sleep quality decreases alertness, attention, and knowledge retention. A study conducted among undergraduate medical students found that sleep quality

and academic performance showed a significant relationship (Rasekhi, Ashouri, & Pirouzan, 2016). There was another study conducted in Nigeria discovered that students with good sleep quality had a better academic performance than those with poor sleep quality (Tobi Seun-Fadipe & Samuel Mosaku, 2017). A study in Malaysia found controversial finding which no association between sleep and academic performance (Nihayah et al., 2011). The result indicated academic performance was not impacted by both quantity and quality of sleep. It might be due to some other factors such as personalities, concentration and attendance of the students (Alhazzani, Masudi, & Algarni, 2018). Therefore, there is a need for additional research as previous studies have shown inconsistent results (Stea, Knutsen, & Torstveit, 2014).

Regular physical activity can help to lower the risk of chronic diseases. Physical activity is also associated with cognitive function due to increase in neurotransmitter such as serotonin (Franz & Feresu, 2013). A study from United States reported positive relationship between physical activity and working memory capacity in young adults. Besides that, another study conducted among medical students in India showed that physical activities and academic performance were related proportionally and had positive influence (Velou & Teli, 2014). Practice of physical exercise linked to improvements of brain structures and thus improves attention, data processing and coping strategies (Maureira, 2017). One of the studies in Taiwan indicated that the improvements of anaerobic power and flexibility were positively associated with the university exam scores (Liao, Chang, Wang, & Wu, 2013). However, there were some inconsistent

findings which found that physical activity had little or no effect on academic success (Iri, Ibis, & Aktug, 2016). More studies need to be conduct as limited data supporting associations of physical activity and academic performance among undergraduate students (Franz & Feresu, 2013).

Poor food consumption pattern and breakfast habit will impact understanding power and further leads to poor academic performance (Sundaram, Ghazi, & Elnajeh, 2018). Breakfast maintain a supply of nutrients to the brain that may positively affect cognition (Rampersaud, Pereira, Girard, Adams, & Metzl, 2005). There were several studies have shown the importance of having breakfast to the academic performance. Studies have demonstrated that breakfast enhances intellectual capacity, concentration, and attention (Taha & Rashed, 2017). The findings of the study indicated that there was a positive correlation between healthy eating behavior and the academic performance (Rehman et al., 2018). A study conducted in Korea also showed that academic performance was strongly associated with breakfast skipping (Kang & Park, 2016). There was some controversial finding which found that no relationship between meal skipping and academic performance (Zunam, Ilias, Mohd Isa, & Danis, 2012). Only few literatures were available regarding the impact of dietary habits on academic performance among undergraduate students (Arasegowda, Asha Rani, Mukherjee, & Nusrath, 2016). Most studies published on healthy dietary habits have examined the effects of breakfast on academic performance mainly in children and adolescents (Valladares et al., 2016).

Obesity and overweight have been implicated as factor in poor academic performance for students. Most of the studies were consistent where students who showed improvements in BMI had a better academic performance (Anderson & Good, 2017). Increases in BMI may have affected students' cognitive performances (Deliens et al., 2014). There was a study conducted among university students in Sri Lanka stated a positive relationship between BMI and academic performances (Wehigaldeniya, Oshani, & Kumara, 2017). A study in Nigeria found controversial finding which BMI was not related to cognition and academic performance (Atare & Nkangude, 2014). This was in contrast to a previous prospective study which has shown that those with a higher BMI were at a higher risk of cognitive impairment (Agarwal, Bhalla, Kaur, & Babbar, 2013). The relationship between obesity and cognitive function is still unclear. A healthy body weight status could have benefits on academic performance but studies have found inconsistent results (García-Hermoso & Marina, 2017).

Moreover, most of the studies are from overseas. There are limited local studies regarding the associations of socio-demographic characteristics, psychological factors (depression, anxiety, stress and self-esteem) and lifestyle factors (sleep quality, physical activity, eating behavior and body weight status) with academic performance among undergraduate students in Malaysia. Further research should be carried out to assess other important factors which may affect academic performance among undergraduate students in Malaysia. Thus, this study was focus on determining the associations of socio-demographic characteristics, psychological factors and lifestyle factors with academic

performance among undergraduate students. This study addressed an important research question:

Are there any associations of socio-demographic characteristics (age, sex, ethnicity, year of study, monthly household income, accommodation, parental education), psychological factors (depression, anxiety, stress and self-esteem) and lifestyle factors (sleep quality, physical activity, eating behavior and body weight status) with academic performance among undergraduate students?

1.3 Significance of the Study

The present study can provide information on factors associated with academic performance among undergraduate students. The findings on the possible associated factors can provide better approaches to improve academic grades among undergraduate students. Furthermore, researcher can fill in the gap of the existing knowledge on the associated factors of academic performance.

The results of the current study can serve as the baseline data for future study among undergraduate students in Malaysia. The findings can provide the beneficial information to policy makers and health care providers to raise the awareness and develop appropriate intervention programs to improve the academic grades of students.

Lastly, the results of the present study can be used to identify the stress level, self-esteem, sleep quality, physical activity level, eating behavior and body weight status among undergraduate students. University can educate and

encourage students to adopt healthy eating and active lifestyle in order to improve cognitive function. Future research can focus on different possible factors that could associate with academic performance among undergraduate students.

1.4 Objectives

1.4.1 General Objective

To determine factors associated with academic performance among undergraduate students in Selangor.

1.4.2 Specific Objectives

- To assess socio-demographic characteristics (age, sex, ethnicity, year of study, monthly household income, accommodation, parental education), psychological factors (depression, anxiety, stress and self-esteem) and lifestyle factors (sleep quality, physical activity, eating behavior and body weight status) among undergraduate students in Selangor.
- To assess academic performance (CGPA) of undergraduate students in Selangor.
- To determine the associations of socio-demographic characteristics (age, sex, ethnicity, year of study, monthly household income, accommodation, parental education), psychological factors (depression, anxiety, stress and self-esteem) and lifestyle factors (sleep quality, physical activity, eating behavior and body weight status) with academic performance among undergraduate students in Selangor.

1.5 Hypothesis

There are significant associations of socio-demographic characteristics (age, sex, ethnicity, year of study, monthly household income, accommodation, parental education), psychological factors (depression, anxiety, stress and self-esteem) and lifestyle factors (sleep quality, physical activity, eating behavior and body weight status) with academic performance among undergraduate students in Selangor.

1.6 Conceptual Framework

This study aims to determine the associations of socio-demographic characteristics (age, sex, ethnicity, year of study, monthly household income, accommodation, parental education), psychological factors (depression, anxiety, stress and self-esteem) and lifestyle factors (sleep quality, physical activity, eating behavior and body weight status) with academic performance among undergraduate students in Selangor. Based on Figure 1.1, the dependent variable is academic performance. Academic performance is the outcome of education which the extent of a student has achieved their educational goals (Arshad et al., 2015). It is the fundamental criterion for passing from one academic level to another. Quality education is important to produce well-educated, skilled and mannered students. Many researchers believed that academic performance is one of the important predictors of success of an educational system and Cumulative Grade Point Average (CGPA) can be considered as the basis of students' academic performance (Maliha Nasir, 2012). There are three main independent

variables which are socio-demographic characteristics, psychological factors and lifestyle factors.

For psychological factors, the variables that assessed were depression, anxiety, stress and self-esteem. A study was conducted by Yousefi et al., (2010) among adolescence in pre-university found that depression and academic performance was significantly correlated. Depressed mood interfere attention, thoughts, which then leads to academic failure. Therefore, depression was found to have an impact on academic performance among adolescents (Yousefi, Mansor, Juhari, Redzuan, & Talib, 2010). Another study was conducted among engineering undergraduate students in Universiti Malaysia Pahang. The result showed students who have high level anxiety achieve low academic performance (Vitasari, Wahab, Othman, Herawan, & Sinnadurai, 2010). A study conducted among 376 undergraduate students Universiti Putra Malaysia (UPM) demonstrated that stress was shown to be significantly correlated to academic performance. Students are able to achieve better academic performance with less stress (Elias et al., 2011). The significant positive correlation between self-esteem and academic performance was reported by a study conducted in University Kebangsaan Malaysia (UKM). Students with high self-esteem tend to feel more confident achieve better than those who lack confidence (Rosli et al., 2012).

In terms of lifestyle factors, sleep quality, physical activity, eating behavior and body weight status will be assessed. Tobi and Samuel Mosaku (2017) found that academic performance of students was improved as sleep quality became better. A study conducted among 200 undergraduate students in RAK

Medical and Health Sciences University showed significant relationship between physical activity and academic performance. Increased physical activity levels tend to improve classroom behaviour as well as academic performance (Elmagd et al., 2015). Another study conducted among adolescent aged 15 and 19 years indicated that eating behaviour especially breakfast consumption had a positive correlation with and students' academic performance. Breakfast enhances intellectual capacity, attention and improves academic performance (Taha & Rashed, 2017). A significant association between healthy BMI and academic performance was demonstrated by Anderson and Good (2017). Individual students with BMI in the obese and overweight categories were more likely to have a lower final grade.

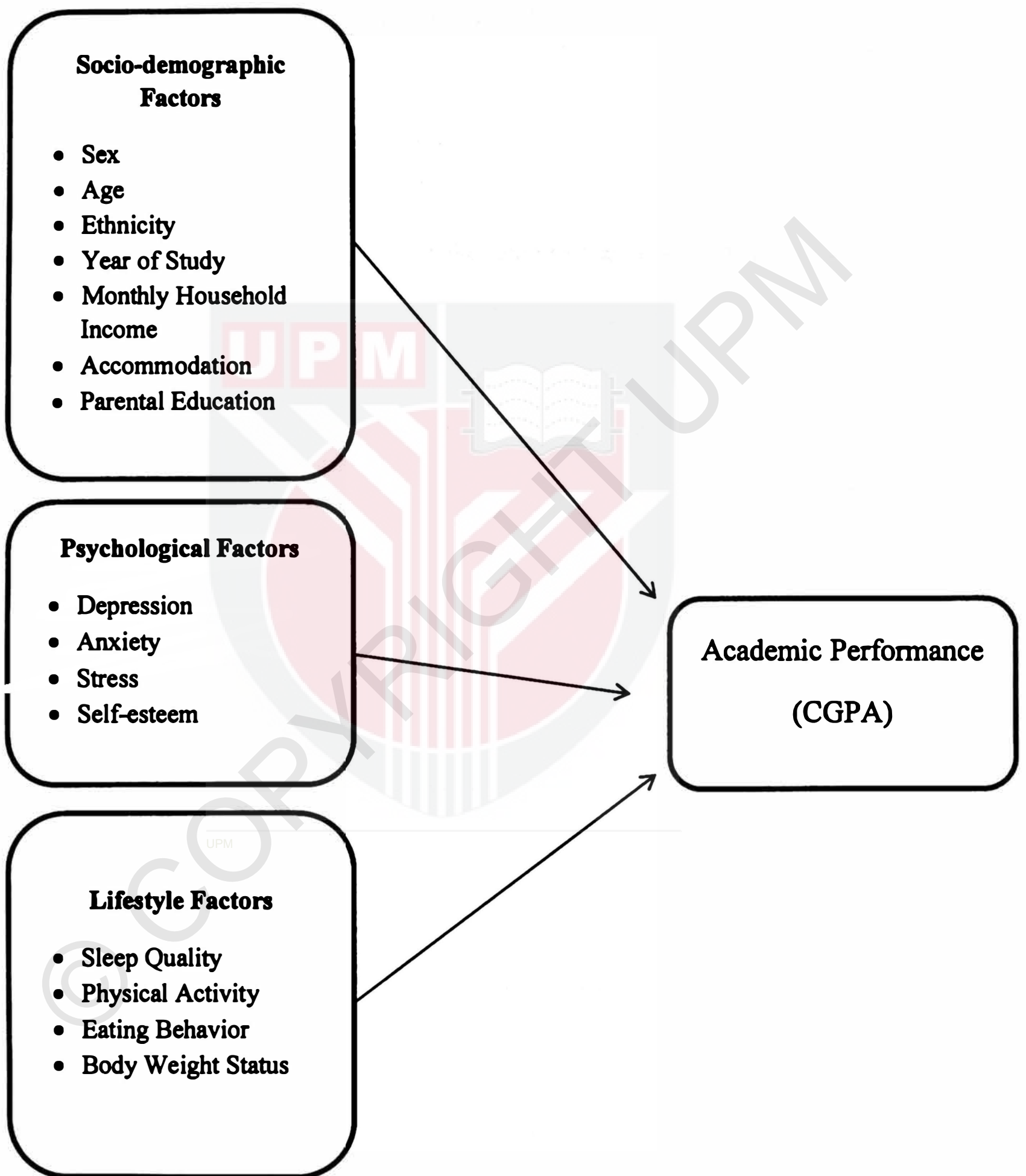


Figure 1.1: Conceptual framework of the study

CHAPTER 2

LITERATURE REVIEW

2.1 Academic Performance

Academic performance is one of the important goals of education. The main concern of educational systems is preparing of young generations to acquire knowledge, skills and training of effective man power. Educational failures caused the deterioration potential of human capital and endanger the sustainable development (Bahrami & Bahrami, 2015). Academic performance refers to acquisition of all the behavioral changes associated with cognitive, affective and psychomotor domains. Academic performance is the outcome of education which the extent of a student has achieved their educational goals (Arshad et al., 2015). It is an important factor in life as it is the basis for ambition and progress (Feroz, 2018). Academic performance is depends on individual's ability. It is multidimensional as it related to human growth in terms of cognitive, emotional, social and physical development (Bhagat, 2016).

2.2 Association of socio-demographics characteristics with academic performance

There was a significant difference in CGPA between male and female. Male was associated with increase in mean CGPA compared to female (Borja-Cacho & Matthews, 2008). A study conducted among Biomedical Science students of Universiti Kebangsaan Malaysia (UKM) found that male students had

higher median of CGPA than female students due to female have slightly higher grades of depression than boys. Depressed mood disrupt concentration and attention of students and thus affect academic performance. They also revealed that males had larger average brain sizes than females and would have higher average IQ (Nihayah et al., 2011). However, there were some controversial findings which indicated that higher academic performance among female students (Elmagd, Mossa, Sami, El-marsafawy, & Jadaan, 2015). This could be explained by females have higher motivation, discipline, study skills and time management compared to males (Deliens, Clarys, Bourdeaudhuij, & Deforche, 2014). There was also a study showed that no significant gender difference in students' academic performance (Kumari & Garita, 2012).

Increase in age brings improvement in academic performance. The mean GPA of older students was found to be significantly higher than younger students (Maliha Nasir, 2012). This was explained by a study conducted among second and third year undergraduate students which older students perform better as they would be more mature and oriented towards their education (Mohamed et al., 2014). They have higher levels of motivation for learning (Maric & Sakac, 2014). A study in conducted in Maldives reported inconsistent finding which younger students performed much better (Imran, Mojgan, Ghavifekr, & Ahmad Zabidi, 2013). There are different values and cultures of various ethnic groups in Malaysia. A study showed the influence of ethnic in relation to academic performance. The main reason was due to existence of a different motivation by different culture (Hizam-hanafiah, Nasri-hussain, & Mokhtar, 2015). Compared to

white students, black and Asian students were particularly less likely to achieve good grades (Thiele, Singleton, Pope, & Stanistreet, 2016).

Academic performance was dependent on socioeconomic indicators such as place of residence, parental education and family income. The students with higher household income performed better academically than the students having low household income. This was supported by a study conducted among three public universities located in Islamabad. They reported that better income resources allowed students to access quality educational experiences (Maliha Nasir, 2012). They also have additional opportunities such as private tuitions from high level instructors and advanced technical knowledge (Imran, Mojgan, Ghavifekr, & Ahmad Zabidi, 2013). However, there was also a study in Saudi Arabia stated that monthly income of the family was not significant (Ahmad et al., 2015). There was also insignificant relationship between residency and academic performance (Siraj et al., 2014). Students living with their families may receive support physically and mentally whereas students living in hostel have interaction with friends and a more favorable social environment (Mohamed et al., 2014). No previous study investigated the role of residency (on or off campus) on academic performance among undergraduate students (Deliens, Clarys, Bourdeaudhuij, & Deforche, 2014).

2.3 Association of psychological factors with academic performance

2.3.1 Depression, Anxiety and Stress

Depression, stress, and anxiety are common psychological problems among students. Depression, stress and anxiety are the factors that can have negative effects on the academic. Depression is characterized by sadness, loss of interest, feelings of guilt or low self-worth, disturbed sleep or appetite, low energy and poor concentration. Anxiety is considered as a bodily response to a perceived danger that could be real or imaginary and triggered by an individual's thoughts, beliefs and feelings. Stress is defined as a state of psychological arousal that results when external demands exceed a person's adaptive abilities (Syed, Ali, & Khan, 2018). Stress, depression and anxiety were interrelated to each other. It will directly influence students daily life and their level of academic performance (Sharma & Pandey, 2017). There were 60.0% of university students left universities due to inability to cope with stress. More than half of university students consulted mental health service due to anxiety, stress and depression. Many studies discovered that students with low academic performance reported a higher level of depression, anxiety and stress compared to those with high academic performance (Basha, 2017).

High level of stress may cause anxiety, depression, poor sleep quality, poor academic performance, psychiatric disorders and reduced quality of life. A study in Delhi showed a significant positive relationship between stress and academic performance of college students (Kumari & Garita, 2012). This was

supported by another study conducted among medical students enrolled in a public university Egypt which reported that 59.9% of undergraduate students experienced moderate level of psychological stress and higher score of stress associated with low academic performance (Fawzy & Hamed, 2017). A study conducted among public universities in Germany also demonstrated that students with unfavorable stress showed impaired academic performance (Kotter, Wagner, Bruheim, & Voltmer, 2017). A few studies conducted in Pakistan discovered that high level of stress may have negative effect on cognitive functioning and learning of students. One of the studies concluded that higher level of stress was associated with poor academic performance (Sohail, 2016). It was also supported by another study showed that stress was statistically significant with academic performance (Hafeez, Khan, Saeed, & Javed, 2016).

However, another study found that there was a significant but weak negative relationship between undergraduate students' stress level and their academic performance due to undergraduate students face a changing education system, lifestyle, and social environment. It may cause increase in psychological distress and thus affect their academics (Elias, Ping, & Abdullah, 2011). One of the studies conducted among 300 students from different private universities of Pakistan showed a controversial relationship which they found that there was no correlation between the stress and the students' academic performance. The results implied students get familiar to the course contents and build up the knowledge base of the enrolled course. Thus, there will be no effects on academic performance (Farhan, 2015). Furthermore, the findings of study conducted by

University Kebangsaan Malaysia (UKM) stated that students with a high level of stress are also able to achieve higher CGPA when they are able to manage their stress (Siraj et al., 2014). Anxiety and depression only have negative impacts towards students. Depression interfere thoughts, emotional and daily life activities (Sharma & Pandey, 2017). Future related research is encouraged to discover the associations of depression, anxiety and stress with academic performance among undergraduate students.

2.3.2 Self-Esteem

Self-esteem is recognized to be a major factor in learning outcomes. Self-esteem has been correlated to job success, school achievement, interpersonal compatibility, and general happiness (Naderi et al., 2009). Self-esteem defined as judgment of oneself as well as an attitude toward the self. Self-esteem also refers to the subjective judgment that a person makes of his ability to face life's challenges (Bhagat, 2016). High self-esteem affects student's thinking, emotion, desires, values and goals in a person (Rosli et al., 2012). Many studies have been conducted to study the relationship between self-esteem and academic performance but there was inconsistency of the results (Bahrami & Bahrami, 2015). A study conducted among pre-university students in Baku State University demonstrated that that there was a positive relationship between self-esteem and academic performance. High self-esteem help individuals to promote changes and open to new things (Aryana, 2010). Finding from a Pakistan study concluded that high level of self-esteem leads to good academic performance (Arshad et al., 2015). This was supported by another study stated that students with higher self-

esteem level had higher academic outcome (Feroz, 2018). It can be explained by students who are more confident tend to have high academic performance.

However, there were also controversial findings showed that there was no significant correlation between the self-esteem level and academic performance (Ahmat, Muda, & Neoh, 2018). This was supported by another study conducted among undergraduate students in Universiti Putra Malaysia (Naderi et al., 2009). These inconsistencies could be due to the differences in study designs and also the self-report bias (Ahmat, Muda, & Neoh, 2018). A cross-sectional study in Iran found that self-esteem of undergraduate students not a statistical correlation with their semester's scores but it positively correlated with the mathematic score (Bahrami & Bahrami, 2015). Due to the discrepancies of the findings, more studies need to be done to confirm the exact relationship of self-esteem with academic performance.

2.4 Association of lifestyle factors with academic performance

2.4.1 Sleep Quality

Sleep helps in learning, memory consolidation, and restorative processes (Nihayah et al., 2011). Many studies strongly suggested that sleep quality is linked with students' learning abilities and academic performance. Studies have indicated that over 60% of college students were poor quality sleepers, resulting in daytime sleepiness and an increase of health problems. A study in conducted among 943 medical students in Germany indicated that low sleep quality could lead to stress and negatively influence exam preparation and performance

(Ahrberg, Dresler, Niedermaier, Steiger, & Genzel, 2012). This was supported by another study conducted in Belgium which they found that there was a positive relation between sleep quality and academic performance. Individual who get less sleep may reduce the brain ability to process memory and learning (Baert, Omeij, Verhaest, & Vermeir, 2015). Moreover, a case-control study from Sudan agreed that poor sleep quality can substantially impair physical, cognitive, and emotional functions. This study found a significant difference between excellent and average students regarding overall sleep quality. A strong relationship was proved between good sleep quality and high academic performance (Mirghani, Mohammed, Almutadha, & Ahmed, 2015).

Insufficient sleep time will resulting in sleepiness, fatigue, and inattentiveness which can diminish students' performance. Nearly two thirds of the students had poor total sleep quality while students with good total sleep quality have good academic score (Kamel, Desouky, Lawend, Abu, & Awed, 2015). The similar findings have been discovered in Iran and Nigeria. About one out of every two students had poor sleep quality (49.5%). Students with good sleep quality had a better academic performance than those with poor sleep quality (Tobi & Samuel Mosaku, 2017). Thus, poor sleep quality and academic performance showed a significant relationship (Rasekhi, Ashouri, & Pirouzan, 2016).

Poor quality of sleep, including short sleep duration, irregular sleep schedules, sleep deprivation, and daytime sleepiness, have all been indicated to negatively affect university students' academics. There were few studies

conducted in United State revealed that higher course grades and academic performance were associated with longer duration of sleep. Sleep is necessary for memory formation of learned information. It enables students to recall information more rapidly and for more prolonged time periods (Zeek et al., 2015). The average sleep duration among adults ranged between 7.5 and 9 hours per night. Findings from a study conducted among public university in the southern United States showed that a total of 60.1% of the students did not get a sufficient amount of sleep (Raley, Naber, Cross, & Perlow, 2016). Having a short bedtime is not only associated with poor academics but also at risk of developing health problems (Stea, Knutsen, & Torstveit, 2014). There were also similar findings found in Ethiopia which a significant positive correlation between sleep duration with increased grade point averages (GPA) (Sarbazvatan, Amini, Aminisani, & Shamshirgaran, 2017). Students who slept more than six hours were observed to have significantly higher academic performance (Hamed et al., 2015). However, there was a study from Saudi Arabia stated that there was no association between sleeping hours and academic performance (Nihayah et al., 2011). Sleep quantity and quality does not play significant roles in academic performance of students (Alhazzani, Masudi, & Algarni, 2018). This might due to short term scale study and overlook student's emotion variable such as mood that could affect the consistency of the results. Thus, there is a need for additional research as previous studies have shown inconsistent results.

2.4.2 Physical Activity

Regular physical activity has been shown to improve muscle function, cardiovascular function and physical performance. Recent studies reported the positive relationship between physical exercise and academic performance of primary, secondary and university students (Maureira, 2017). There was a study conducted among biochemistry students at the University of Nebraska-Lincoln in United States showed a positive relationship between level of physical activity and working memory capacity in young adults (Franz & Feresu, 2013). Physical exercise has been linked to improvement in cognitive functions such as attention, memory, planning and inhibition due to the development of new cerebral blood vessels, increased synaptic density and neurogenesis (Maureira, 2017). Another study in Turkey has supported that physical activity affects the brain structure and functions through several mechanisms. Physiological changes occur in brain affect concentration, memory processing and thus improving academic (Iri, Ibis, & Aktug, 2016).

Several studies suggested that increased physical activity could induce arousal and lessen boredom which leads to increase classroom concentration and attention span (Elmagd, Mossa, Sami, El-marsafawy, & Jadaan, 2015). Physical activity also provides sense of happiness, sociability and reducing the risk of depression and anxiety (Munoz-Bullon, Sanchez-Bueno, & Vos-Saz, 2017). No studies have found that unfavorable effects of physical activity towards academic performance. Physical activities and academic performance was related proportionally and it plays an important role on the education of the students

(Velou & Teli, 2014). A study in Taiwan found that physical fitness was part of the strategy to improve academic performance. They concluded that improvements of anaerobic power and flexibility were positively associated with the university exam scores (Liao, Chang, Wang, & Wu, 2013). However, there are limited findings supporting an association between physical activity and academic performance. More studies need to be carried out to examine the effects of physical activity on academic performance among undergraduate students.

2.4.3 Eating Behavior

Poor eating behavior are a major public health concern among young adults who experienced transition into university life. Eating breakfast is essential for balanced nutrient intake and healthful nutritional status. It can impact body weight status and cognitive ability which is related to memory and academic performance (Kang & Park, 2016). Breakfast is the first meal of the day and is the meal that keeps a student active and alert. However, most of the students tend to skip breakfast and it caused them to have difficulties in attending long lectures, affect brain understanding power and further leads to poor academic performance (Sundaram, Ghazi, & Elnajeh, 2018). The positive effect of breakfast on aspects of memory function has been shown in experimental studies among adults in United State (Rampersaud, Pereira, Girard, Adams, & Metzl, 2005). This was supported by a study conducted among 4,000 high school students in Korea which reported that skipping breakfast has been shown to have a higher body mass index (BMI) and lower academic performance (Kang & Park, 2016).

Eating behavior usually affected by food availability, food preferences, portion size, cultural values, family beliefs, and food styles. A positive association between eating behavior and academic performance was observed among university students in Chile (Valladares et al., 2016). Balanced diet is important not only in maintaining physical health but also in promoting emotional well-being and psychosocial functioning (Zunam, Ilias, Mohd Isa, & Danis, 2012). Recent studies have demonstrated that breakfast enhances intellectual capacity, concentration, attention and academic performance. There was a positive correlation between breakfast intake and the students' scores (Taha & Rashed, 2017). More consumption of fast food was associated with significant poorer performance in academics (Arasegowda, Asha Rani, Mukherjee, & Nusrath, 2016). However, another study in Malaysia showed a controversial relationship which meal skipping was not associated with academic performance. This may be due to confounder factor such as family or peer influence. The finding of this study only revealed that low fat eating behavior was significant to student's academic performance as it will cause weight gain and increase risk of getting chronic diseases. Students with poor health will lead to absenteeism and tend to have lower academic performance (Zunam, Ilias, Mohd Isa, & Danis, 2012). Future study is suggested to assess the effects of breakfast on academic performance among undergraduate students as most of the studies mainly focus on children and adolescents.

2.4.4 Body Weight Status

The prevalence of obesity is increasing worldwide and the major causative factors are related to lifestyle changes occurring due to rapid socio-economic transition. Increase in sedentary mainly due to mechanization, improved motorized transport, sedentary lifestyle and consumption of fast food and sweetened carbonated drinks have resulted in positive energy balance in most of the countries (Agarwal, Bhalla, Kaur, & Babbar, 2013). Obesity and/or being overweight have been implicated as factors in poor academic performance for elementary and high school-aged students. Improved BMI could possibly lead to improved academic performances within a college course. A study conducted among 395 adolescents in Chile found that obesity was associated with poorer cognitive function, specifically executive functioning skills such as inhibitory control and working memory. They discovered that overweight students were 2.22 times and normal weight students 3.72 times more likely to have high academic performance than obese students (Garcia-Hermoso & Marina, 2017). The findings were consistent with other studies where elementary or high school children who showed improvements in BMI had a statistical significant improvement in academic performance (Anderson & Good, 2017).

Increases in BMI may have affected students' cognitive performances and were related to lower academic performance (Deliens, Clarys, Bourdeaudhuij, & Deforche, 2014). The similar findings were also reported in Sri Lanka which students in the normal BMI category had significantly exam scores than students in the overweight category. One of the studies found that there was lower

significant association between BMI and academic performance (Wehigaldeniya, Oshani, & Kumara, 2017). However, a study conducted among 18-21 years old first year medical students in New Delhi, India stated that no association between BMI and cognition. This was in contrast to a previous prospective study which has shown that those with a higher BMI in midlife were at a higher risk of cognitive impairment later in life (Agarwal, Bhalla, Kaur, & Babbar, 2013). The reason for discrepancy may be due to the young age of subjects as the steepest decline in cognition occurs in late middle age. Another study in Nigeria also reported conflicting findings. They concluded that BMI was not related to academic performance (Atare & Nkangude, 2014). They suggested that conducive learning environment and genetic would influence academic performance rather than body mass profile. Due to the inconsistency of the findings, more research has to be conducted to provide strong evidence on the associations of body weight status with academic performance.

CHAPTER 3

METHODOLOGY

3.1 Study Design

This was a cross-sectional survey, which aimed to determine the associations of socio-demographic characteristics, psychological factors and lifestyle factors with academic performance among undergraduate students in Selangor.

3.2 Study Location

This study was conducted in two selected public and private universities. The selected public university was Universiti Putra Malaysia (UPM) located in Serdang, Selangor while the selected private university was University of Nottingham Malaysia located in Semenyih, Selangor. UPM located about 30km south of the capital city of Kuala Lumpur and 16km north of the Federal Territory of Putrajaya. The Serdang campus of UPM is 1108.103 hectares in size and consists of a total of 16 faculties and 9 institutes. There were about 23,193 total students in UPM which 14,264 are comprises of undergraduate students (UPM, 2016). The University of Nottingham Malaysia Campus situated on a 101 acre site and 30km from Kuala Lumpur. It consists of 18 schools/departments and the total enrollment is about 5,000 students. However, approximately 3,412 were comprises of undergraduate students (UNMC, 2016).

3.3 Study Subjects

The subjects of this study were undergraduate students of selected programme from Bachelor of Landscape Architecture and Bachelor of Biomedical Sciences.

They were selected based on the following inclusion and exclusion criteria:

Inclusion criteria:

- 1. Male or female undergraduate students**
- 2. Aged 18 and above undergraduate students**

Exclusion criteria:

- 1. Non-Malaysian**
- 2. Pregnant/Breastfeeding students**
- 3. Taking long term medication**
 - (eg, benzodiazepines, pregabalin) that could affect memory function (Chavant, Favreliere, Lafay-Chebassier, Plazanet, & Perault-Pochat, 2011)**
- 4. Having adverse health condition**
 - (eg, cardiovascular disease, hypertension) that could affect cognitive function (Chavant et al., 2011)**

3.4 Sample Size Determination

In this study, the sample size for each variable (socio-demographic characteristics, depression, anxiety, stress, self-esteem, sleep quality, physical activity, eating

behaviors and body weight status) were calculated by using the following formula and the biggest sample size is the sample size of this study (Hulley, Cummings, Browner, Grady, & Newman, 2013):

- **Association of depression with academic performance of undergraduate students in Selangor.**

The sample size required for this study calculated by using the formula as shown below:

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

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

where

The standard normal deviate for $\alpha = Z_{\alpha} = 1.96$

The standard normal deviate for $\beta = Z_{\beta} = 0.84$

r = the expected correlation coefficient (-0.22) ; (Yousefi et al., 2010)

$$C = 0.5 * \ln [(1 + 0.22) / (1 - 0.22)]$$

$$= 0.224$$

$$N = [(1.96 + 0.84) / 0.224]^2 + 3$$

$$= 160$$

- **Association of anxiety with academic performance of undergraduate students in Selangor.**

The sample size required for this study calculated by using the formula as shown below:

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

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

where

The standard normal deviate for $\alpha = Z_{\alpha} = 1.96$

The standard normal deviate for $\beta = Z_{\beta} = 0.84$

r = the expected correlation coefficient (-0.264) ; (Vitasari et al., 2010)

$$C = 0.5 * \ln [(1+0.264) / (1 - 0.264)]$$
$$= 0.270$$

$$N = [(1.96 + 0.84) / 0.198]^2 + 3$$
$$= 111$$

- **Association of stress with academic performance of undergraduate students in Selangor.**

The sample size required for this study calculated by using the formula as shown below:

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

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

where

The standard normal deviate for $\alpha = Z_{\alpha} = 1.96$

The standard normal deviate for $\beta = Z_{\beta} = 0.84$

r = the expected correlation coefficient (-0.195) ; (Elias et al., 2011)

$$C = 0.5 * \ln [(1+0.195) / (1 - 0.195)]$$
$$= 0.198$$

$$N = [(1.96 + 0.84) / 0.198]^2 + 3$$
$$= 203$$

- **Association of self-esteem with academic performance of undergraduate students in Selangor.**

The sample size required for this study calculated by using the formula as shown below:

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

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

where

The standard normal deviate for $\alpha = Z_{\alpha} = 1.96$

The standard normal deviate for $\beta = Z_{\beta} = 0.84$

r = the expected correlation coefficient (0.32) ; (Rosli et al., 2012)

$$C = 0.5 * \ln [(1+0.32) / (1-0.32)]$$

$$= 0.332$$

$$N = [(1.96 + 0.84) / 0.332]^2 + 3$$

$$= 75$$

- **Association of sleep quality with academic performance of undergraduate students in Selangor.**

The sample size required for this study calculated by using the formula as shown below:

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

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

where

The standard normal deviate for $\alpha = Z_{\alpha} = 1.96$

The standard normal deviate for $\beta = Z_{\beta} = 0.84$

r = the expected correlation coefficient (-0.30) ; (Tobi & Samuel Mosaku, 2017)

$$C = 0.5 * \ln [(1 + 0.30) / (1 - 0.30)]$$
$$= 0.310$$

$$N = [(1.96 + 0.84) / 0.310]^2 + 3$$
$$= 85$$

- **Association of physical activity with academic performance of undergraduate students in Selangor.**

The sample size required for this study calculated by using the formula as shown below:

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

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

where

The standard normal deviate for $\alpha = Z_{\alpha} = 1.96$

The standard normal deviate for $\beta = Z_{\beta} = 0.84$

r = the expected correlation coefficient (0.206) ; (Elmagd et al., 2015)

$$C = 0.5 * \ln [(1 + 0.206) / (1 - 0.206)]$$
$$= 0.209$$

$$N = [(1.96 + 0.84) / 0.209]^2 + 3$$
$$= 183$$

- **Association of eating behaviour with academic performance of undergraduate students in Selangor.**

The sample size required for this study calculated by using the formula as shown below:

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

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

where

The standard normal deviate for $\alpha = Z_{\alpha} = 1.96$

The standard normal deviate for $\beta = Z_{\beta} = 0.84$

r = the expected correlation coefficient (0.445) ; (Taha & Rashed, 2017)

$$C = 0.5 * \ln [(1 + 0.445) / (1 - 0.445)]$$

$$= 0.478$$

$$N = [(1.96 + 0.84) / 0.478]^2 + 3$$

$$= 38$$

- **Association of body weight status with academic performance of undergraduate students in Selangor.**

The sample size required for this study calculated by using the formula as shown below:

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

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

where

The standard normal deviate for $\alpha = Z_{\alpha} = 1.96$

The standard normal deviate for $\beta = Z_{\beta} = 0.84$

r = the expected correlation coefficient (-0.308) ; (Anderson & Good, 2017)

$$C = 0.5 * \ln [(1 + 0.308) / (1 - 0.308)]$$
$$= 0.318$$

$$N = [(1.96 + 0.84) / 0.318]^2 + 3$$
$$= 81$$

****The highest number of respondents was 203.**

A. Adjust for the estimated sample design effect:

$$DEFF = 1.3 \text{ (Aday \& Cornelius, 2006)}$$

$$n \times DEFF$$

$$= 203 \times 1.3$$

$$265$$

****The minimum sample size in this study was a total of 265 respondents.**

3.5 Sampling Design

Sampling method in this study was shown in Figure 3.1. Simple random sampling was conducted by using Microsoft Excel to select one university from each public universities and private universities. It is then followed by cluster sampling to select one study programs from each of the selected universities respectively.

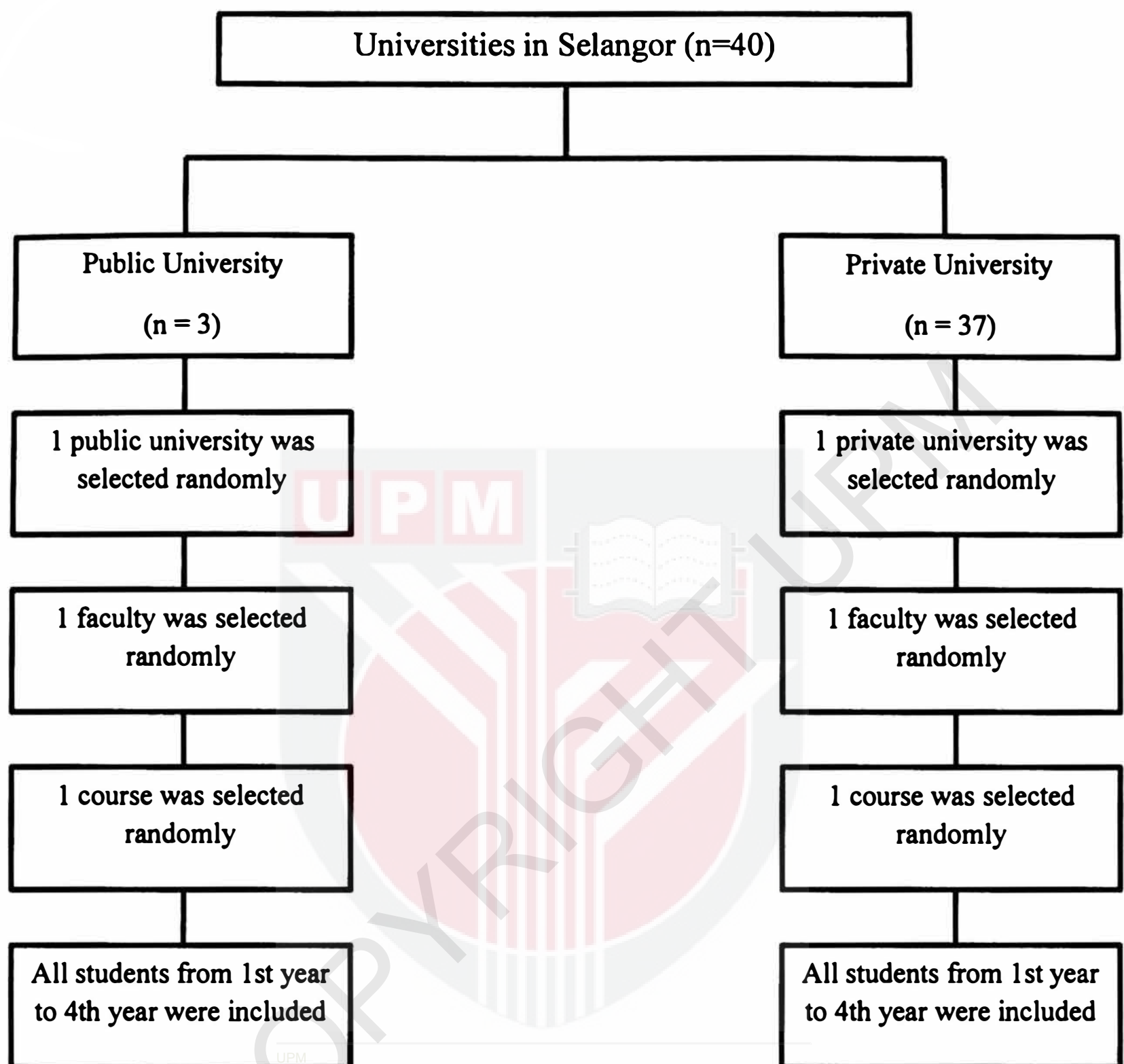


Figure 3.1 Flowchart of sampling design

In the present study, the two selected universities were Universiti Putra Malaysia and University of Nottingham Malaysia. The programs that selected were Bachelor of Landscape Architecture (n=185) from Universiti Putra Malaysia and Bachelor of Biomedical Sciences (n=80) from University of Nottingham Malaysia. 265 undergraduate students were recruited.

3.6 Instruments

Two main instruments used in this study which were a set of self-administered questionnaire and anthropometric measurements.

3.6.1 Self-administered questionnaire

All the respondents were completed a set of self-administered questionnaire which asked about socio-demographic characteristics, psychological factors (depression, anxiety, stress, and self-esteem) lifestyle factors (sleep quality, physical activity, eating behavior and body weight status) with academic performance. The details of the questionnaire were listed below.

A. Socio-demographic characteristics

The socio-demographic characteristics consisted of seven items. The respondents were required to provide information on age, sex, ethnicity, year of study, monthly household income, accommodation, parental education.

B. Depression, Anxiety and Stress

The 21-item depression anxiety stress scale (DASS-21) is a self-reporting tool designed to measure the psychological distress along the constructs of depression, anxiety and stress (Nordin, Kaur, Soni, Por, & Miranda, 2017). This is the shortened version of the 42-item depression, anxiety, stress scale (DASS-42) developed in 1995. DASS-21 was demonstrated to be more stable and distinctive compared to the DASS-42 (Nordin et al., 2017). The DASS-21 has been translated in various

languages and validated in different populations with internal consistencies reliability (Cronbach's Alpha scores) ranging from 0.74 to 0.93. An earlier study on Malay version DASS-21 showed that it had good psychometric properties for the Malaysian general population (Ramli, Salmiah, & Nurul Ain, 2009). A study conducted among outpatient clinic attendees in Johor reported Cronbach's alpha for depression, anxiety and stress were 0.863, 0.850 and 0.837 respectively. It was consider to be reliable based in the cut-off criterion at least 0.719 (Nordin et al., 2017). Another study in Malaysia stated the internal consistency of this DASS-21 revealed good Cronbach's alpha values which were 0.75, 0.74 and 0.79. For construct validity, it also had good factor loading values for 17 out of 21 items (.31 to .75) (Ramli et al., 2009).

Each of the three DASS-21 scales contains seven items, divided into subscales with similar content. The depression scale assesses dysphoria, hopelessness, devaluation of life, self-deprecation, lack of interest / involvement, anhedonia and inertia. The anxiety scale assesses autonomic arousal, skeletal muscle effects, situational anxiety, and subjective experience of anxious affect. The stress scale is sensitive to levels of chronic non-specific arousal. It assesses difficulty relaxing, nervous arousal, and being easily upset / agitated, irritable / over-reactive and impatient. Scores for depression, anxiety and stress are calculated by summing the scores for the relevant items and multiplied by two to

calculate the final score. Recommended cut-off scores for conventional severity labels (normal, moderate, severe) are shown in Table 3.1:

S (Stress) - Q1, 6, 8, 11, 12, 14, 18

A (Anxiety) - Q2, 4, 7, 9, 15, 19, 20

D (Depression) - Q3, 5, 10, 13, 16, 17, 21

Table 3.1 Classifications based on total scores of Depression, Anxiety, Stress Scale (DASS-21)

	Depression	Anxiety	Stress
Normal	0-9	0-7	0-14
Mild	10-13	8-9	15-18
Moderate	14-20	10-14	19-25
Severe	21-27	15-19	26-33
Extremely Severe	28+	20+	34+

C. Self-esteem

The Rosenberg Self-Esteem Scale (RSES) is one of the most widely used to measure self-esteem (Tinakon & Nahathai, 2012). It was developed by Morris Rosenberg in 1965 and is widely used in psychology, mental health and psychiatry. The internal consistency was demonstrated to be good with Cronbach's alpha of 0.85. A study from Chiang Mai University reported that revised version of RSES have good levels of reliability and showed a better construct validity (Tinakon & Nahathai, 2012). RSES is short and easy to administer. It is a Likert-scale type test with ten items answered on a four point scale with responses ranging from strongly disagree (0) to strongly agree (3). Items 2, 5, 6, 8, 9 are reverse scored with strongly disagree (3) to strongly agree (0). Total scores range from 10 to 40. Scores under 15 indicates low self-esteem, scores between

15-25 consider as normal self-esteem, while scores more than 25 and above was high self-esteem (Fawzy & Fouad, 2010; Pop, 2016).

D. Sleep Quality

The Pittsburgh Sleep Quality Index has been used to examine sleep among various clinical, experimental, and normative samples. Cronbach's alpha for the PSQI questionnaire was found to be 0.736. It showed that PSQI had internal consistency, internal homogeneity, and diagnostic characteristics (Manzar et al., 2015). Besides that, a study conducted in Malaysia was generally supported that validity of PSQI and utility for evaluating sleep problems with the Cronbach's Alpha 0.63 (Yunus et al., 2017).

The PSQI is a nineteen-item questionnaire measuring seven components of sleep: subjective sleep quality, sleep latency, sleep duration, habitual sleep efficiency, sleep disturbances, use of sleeping medication, and daytime dysfunction. PSQI has been translated into various languages and is widely used in research studies. Each component score ranged from 0 to 3, where 0 indicated "no difficulty" and 3 indicated "severe difficulty". The scoring of PSQI was shown in Table 3.2. All components were then summed to yield a global PSQI scores ranging from 0 to 21. Higher scores indicated poorer sleep (Yunus et al., 2017). Table 3.3 showed that a total PSQI score greater than 5 is classified as poor quality sleep and those with PSQI score less than or equal to 5 is classified as good sleep quality (Baert et al., 2015).

Table 3.2 Classifications based on total scores of Pittsburgh Sleep Quality Index (PSQI)

Classifications	Scores
Poor sleep	>5
Good sleep	≤5

E. Physical Activity

The Global Physical Activity Questionnaire (GPAQ) was developed under the World Health Organization (WHO) in 2002 as part of the WHO STEPwise Approach to Chronic Disease Risk Factor Surveillance (STEPS). The GPAQ instrument is a set of 16 items questions designed to estimate an individual’s level of physical activity in 3 domains (work, transport and leisure time) and sedentary time. It was recently validated in Malaysian, Vietnamese and American adults (Cleland et al., 2014). A validity study conducted among nine countries showed that overall GPAQ items have good reproducibility with pooled correlations of mostly greater than 0.72. Concurrent validity of GPAQ demonstrated an acceptable level of association (0.45 to 0.57) (Bull, Maslin, & Armstrong, 2009). Previous studies have reported that the GPAQ have better reliability and accuracy for persons with stable work patterns (Lingesh et al., 2016). This was supported by another study from Ireland suggest that the self-report GPAQ may be used appropriately to estimate levels of moderate and vigorous physical activity but not a valid measure of sedentary (Cleland et al., 2014).

Questions assess the frequency and duration of activities. Total vigorous-intensity activity is sum of vigorous at work plus vigorous in discretionary domain while total moderate-intensity activity is sum of moderate-intensity activity at work plus total transport-related plus total discretionary moderate intensity activity (Bull et al., 2009). METs were calculated based on the following: walking = 4.0 METs, moderate = 4.0 METs and vigorous week = 8.0 METs. The METs was calculated as minutes of activity/day x days per week x MET level. The classifications based on total scores of GPAQ were shown in Table 3.4.

Table 3.3 Classifications based on total scores of Global Physical Activity Questionnaires (GPAQ)

Classifications	Criteria
Low	A person who does not meet either the “high” or “moderate” PA level criteria falls in this category
Moderate	3 or more days of vigorous intensity activity of at least 20 minutes per day / 5 or more days of moderate-intensity activity or walking of at least 30 minutes per day / 5 or more days of any combination of walking, moderate- or vigorous intensity activities achieving a minimum of at least 600 MET-min/week
High	Vigorous-intensity activity on at least 3 days achieving a minimum of at least 1,500 MET-min/week / 7 or more days of any combination of walking, moderate or vigorous intensity activities achieving a minimum of at least 3,000 MET-min/week

F. Eating Behavior

Eating Behaviour Questionnaire (EBQ) is a validated nine-item questionnaire that used to assess the eating behaviors of Malaysian university students including meal consumption, frequency of snacking between meals, type of snacks consumption, frequency of eating outside and take-away food, use of dietary supplement, type of dietary consumption and participation in body change programs (Gan, Mohd Nasir, Zalilah, & Hazizi, 2011). All the items in EBQ are responded in an eight-point frequency scale (0= 0 day per week, 1= 1 day per week, 2= 2 day per week, 3= 3 day per week, 4= 4 day per week, 5= 5 day per week, 6= 6 day per week, 7= 7 day per week). Each of the items in EBQ was analyzed individually to determine the frequency of each eating behavior.

G. Academic Performance

Academic performance can be illustrated by grade point average (GPA) or cumulative grade point average (CGPA) (Siraj et al., 2014). However, most of the studies in Malaysia used CGPA to determine academic performance among undergraduate students. A study conducted among undergraduate pharmacy students from year 1 to 4 in Universiti Teknologi MARA determine their student's academic performance by CGPA (Ahmat et al., 2018). There were also a few studies conducted by University Kebangsaan Malaysia (UKM) referring to CGPA (Rosli et al., 2012). Table 3.5 below showed the classifications of academic performance (CGPA).

Table 3.4 Classifications of academic performance (CGPA)

Score	Classes	Grade	Grade Point Average
70 – 100	First Class Honour	A	4.00
60 – 69.99	Second Upper Class Honour	A- / B+	3.30 – 3.99
50 – 59.99	Second Lower Class Honour	B	3.00 – 3.29
40 – 49.99	Third Class Honour	B- / C+	2.30 – 2.99
< 40	Fail	F	< 2.30

3.6.2 Anthropometric Measurements

3.6.2.1 Body Weight and Height

The respondents were measured for their body weight and height to obtain their Body Mass Index (BMI) in the present study. Body weight and height of the respondents were measured by using TANITA weighing scale and SECA Stadiometer respectively. BMI of the respondents was calculated using the formula as shown below:

$$\text{BMI} = \frac{\text{Weight (kg)}}{\text{Height (m)}^2}$$

BMI of the respondents was classified into underweight, normal weight, overweight and obesity according to the WHO BMI classifications (WHO, 1995) as shown in Table 3.6.

Table 3.5 Classifications of Body Mass Index

Classifications	BMI (kg/m²)
Underweight	<18.50
Normal weight	18.50 – 24.99
Overweight	25.00 – 29.99
Obesity	≥30.00

3.7 Pre-testing

Pre-test of the questionnaires was conducted before the actual data collection among students of the non-selected programme in UPM. A sample size of 30 and above was preferable during the pre-test of the questionnaires to detect any prevalent problems (Perneger, Courvoisier, Hudelson, & Gayet-Ageron, 2015). Therefore, 30 undergraduate students who meet the criteria were selected in the pre-test. The purpose of pre-test was to test the appropriateness of instruments and estimate the time needed for the respondents to answer one set of the questionnaires. The feedbacks from the students were analyzed and correction of questionnaire had done after the pre-testing. All students of pre-test were not involved in the study sample. The time needed to complete a set of questionnaire was about 20 minutes.

3.8 Data Collection

Before the data collection, research ethical approval was obtained from the Ethics Committee for Research Involving Humans of Universiti Putra Malaysia. Data collection conducted from December to February 2019. Permissions to conduct the study were obtained from the Dean of the selected faculty in Universiti Putra Malaysia (UPM) and head of department of selected faculty in

University of Nottingham Malaysia prior to data collection. Respondents were first briefed with the purposes of this study with a given information sheet and consent form. The respondents who meet the selection criteria were requested to answer a set of self-administered questionnaire. Anthropometric measurements were then carried out by researcher.

3.9 Data Analysis

All data were analyzed by using IBM SPSS Statistics 23. Univariate analysis was used to analyze descriptive data such as socio-demographic characteristics. The results were presented in the form of frequencies and percentages for categorical variables whilst means and standard deviations for continuous variables.

Chi-square test was used to determine the associations of independent variables with academic performance which is academic performance (CGPA). Furthermore, one-way ANOVA was used to measure the differences between continuous independent variables and categorical dependent variable. The level of statistical significance was set to be at $p < 0.05$.

CHAPTER 4

RESULTS AND DISCUSSIONS

4.1 Socio-demographic Characteristics

Table 4.1 presented the socio-demographic characteristics of respondents in the present study. A total of 265 undergraduate students (66.4% female and 33.6% male) were participated in this study. Majority of respondents were in the age 21-23 years old which contributed 75.5%. By ethnicity, 62.3% were Malay, 20.4% were Chinese, 10.9% were Indians, and 6.4% were other races. Respondents were recruited from Bachelor of Landscape Architecture (69.1%) and Bachelor of Biomedical Sciences (30.9%). First year and second year contributed around 31.7% and 28.3% respectively followed by third year (26.8%) and fourth year (13.2%). More than half of the respondents were staying in campus (81.5%). A majority of the monthly household income were between RM2300.00 to RM5599.99 (47.5%). For the parental education, respondent's father (35.0%) and mother (43.5%) had attained at least secondary school level. About half (50.6%) of students were in the category of second upper class honour followed by second lower class honour (28.7%) and third class honour (11.3%). Only 9.4% of students had rewarded as first class honour.

Table 4.1 Distribution of respondents by socio-demographic characteristics (n=265)

Socio-demographic characteristics		Respondents, n (%)
Age (years) ¹	18 – 20	49 (18.5)
	21 – 23	200 (75.5)
	>23	16 (6.0)
Sex	Male	89 (33.6)
	Female	176 (66.4)
Ethnicity	Malay	165 (62.3)
	Chinese	54 (20.4)
	Indian	29 (10.9)
	Others (eg. Bumiputera)	17 (6.4)
Course of Study	Bachelor of Landscape Architecture	183 (69.1)
	Bachelor of Biomedical Sciences	82 (30.9)
Year of Study	Year 1	84 (31.7)
	Year 2	75 (28.3)
	Year 3	71 (26.8)
	Year 4	35 (13.2)
Accommodation	In campus	216 (81.5)
	Out campus	28 (10.6)
	Home with family	21 (7.9)
Monthly Household Income ²	<RM2300.00	61 (23.0)
	RM2300 – RM 5599.99	126 (47.5)
	≥RM5600.00	78 (29.5)
Father's Education Level	No formal education	14 (5.4)
	Primary education	32 (12.3)
	Secondary education	91 (35.0)
	Pre-university	43 (16.5)
	Tertiary education	80 (30.8)
Mother's Education Level	No formal education	18 (6.9)
	Primary education	28 (10.8)
	Secondary education	113 (43.5)
	Pre-university	39 (15.0)
	Tertiary education	62 (23.8)
Academic Performance CGPA ³	First class honour	25 (9.4)
	Second upper class honour	134 (50.6)
	Second lower class honour	76 (28.7)
	Third class honour	30 (11.3)

Source: ¹Farhan, 2015; ²Based on 10th Malaysia Plan (Economic Planning Unit, 2010); ³Tobi & Samuel Mosaku, 2017; Ministry of Education Malaysia, 2010

4.2 Psychological Factors

4.2.1 Depression, Anxiety and Stress

Depression, anxiety and stress were measure using Depression Anxiety Stress Scale (DASS-21) scale (Nordin et al., 2017). It is a modified and shorter version which consisted of 21 items. Table 4.2 showed the distribution of undergraduate students by its items in DASS-21.

Table 4.2 Distribution of respondents by depression, anxiety and stress (n=265)

Items		Respondents, n (%)			
		Did not apply to me at all	Applied to me to some degree, or some of the time	Applied to me to a considerable degree, or a good part of time	Applied to me very much, or most of the time
1.	I found it hard to wind down	89 (33.6)	122 (46.0)	48 (18.1)	6 (2.3)
2.	I was aware of dryness of my mouth	63 (23.8)	99 (37.4)	72 (27.2)	31 (11.7)
3.	I couldn't seem to experience any positive feeling at all	125 (47.2)	96 (36.2)	38 (14.3)	6 (2.3)
4.	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion)	153 (57.7)	78 (29.4)	28 (10.6)	6 (2.3)
5.	I found it difficult to work up the initiative to do things	71 (26.8)	121 (45.7)	65 (24.5)	8 (3.0)
6.	I tended to over-react to situations	91 (34.3)	116 (43.8)	48 (18.1)	10 (3.8)
7.	I experienced trembling (eg, in the hands)	141 (53.2)	70 (26.4)	41 (15.5)	13 (4.9)
8.	I felt that I was using a lot of nervous energy	73 (27.5)	112 (42.3)	63 (23.8)	17 (6.4)

Table 4.2 (Cont.) Distribution of respondents by depression, anxiety and stress (n=265)

Items	Respondents, n (%)			
	Did not apply to me at all	Applied to me to some degree, or some of the time	Applied to me to a considerable degree, or a good part of time	Applied to me very much, or most of the time
9. I was worried about situations in which I might panic and make a fool of myself	79 (29.8)	95 (35.8)	67 (25.3)	24 (9.1)
10. I felt that I had nothing to look forward to	134 (50.6)	87 (32.8)	35 (13.2)	9 (3.4)
11. I found myself getting agitated	103 (38.9)	115 (43.4)	39 (14.7)	8 (3.0)
12. I found it difficult to relax	101 (38.1)	115 (43.4)	41 (15.5)	8 (3.0)
13. I felt down-hearted and blue	98 (37.0)	121 (45.7)	37 (14.0)	9 (3.4)
14. I was intolerant of anything that kept me from getting on with what I was doing	82 (30.9)	128 (48.3)	45 (17.0)	10 (3.8)
15. I felt I was close to panic	125 (47.2)	98 (37.0)	38 (14.3)	4 (1.5)
16. I was unable to become enthusiastic about anything	122 (46.0)	114 (43.0)	21 (7.9)	8 (3.0)
17. I felt I wasn't worth much as a person	156 (58.9)	72 (27.2)	26 (9.8)	11 (4.2)
18. I felt that I was rather touchy	65 (24.5)	99 (37.4)	77 (29.1)	24 (9.1)
19. I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat)	107 (40.4)	90 (34.0)	51 (19.2)	17 (6.4)
20. I felt scared without any good reason	136 (51.3)	83 (31.3)	38 (14.3)	8 (3.0)
21. I felt that life was meaningless	174 (65.7)	64 (24.2)	21 (7.9)	6 (2.3)

The prevalence of psychological distress among undergraduate students in the present study was shown in Table 4.3. Among 265 undergraduates, the prevalence of undergraduates who were at risk of depression, anxiety, and stress were 46.4%, 67.9%, and 38.5% respectively. For depression symptom, 53.6% of the undergraduates were classified as normal whereas 14.3%, 21.9%, 5.3% and 4.9% of them were classified as mild, moderate, severe and extremely severe respectively. For anxiety symptom, 32.1% of the undergraduates were classified as normal. The percentage for mild, moderate, severe and extremely severe were 12.1%, 21.5%, 14.0%, and 20.3% respectively. More than half of the undergraduate students (61.5%) were classified as normal stress, followed by mild (16.6%), moderate (12.8%), severe (6.8%) and extremely severe (2.3%).

Table 4.3 Distribution of respondents by classification of depression, anxiety and stress (n=265)

Variables	n (%)			t-value	p-value
	Male	Female	Total		
Depression					
Normal (0-9)	40 (44.9)	102 (58.0)	142 (53.6)	1.142	0.255
Mild (10-13)	16 (18.0)	22 (12.5)	38 (14.3)		
Moderate (14-20)	21 (23.7)	37 (21.0)	58 (21.9)		
Severe (21-27)	6 (6.7)	8 (4.5)	14 (5.3)		
Extremely severe (≥28)	6 (6.7)	7 (4.0)	13 (4.9)		
Anxiety					
Normal (0-7)	31 (34.8)	54 (30.7)	85 (32.1)	0.752	0.453
Mild (8-9)	9 (10.1)	23 (13.1)	32 (12.1)		
Moderate (10-14)	14 (15.7)	43 (24.4)	57 (21.5)		
Severe (15-19)	10 (11.2)	27 (15.3)	37 (14.0)		
Extremely severe (≥20)	25 (28.2)	29 (16.5)	54 (20.3)		

Table 4.3 (Cont.) Distribution of respondents by classification of depression, anxiety and stress (n=265)

Variables	n (%)		Total	t-value	p-value
	Male	Female			
Stress					
Normal (0-14)	54 (60.7)	109 (61.9)	163 (61.5)		
Mild (15-18)	14 (15.7)	30 (17.0)	44 (16.6)		
Moderate (19-25)	12 (13.5)	22 (12.5)	34 (12.8)	0.382	0.703
Severe (26-33)	6 (6.7)	12 (6.8)	18 (6.8)		
Extremely severe (≥ 34)	3 (3.4)	3 (1.8)	6 (2.3)		

The prevalence of depression, anxiety, and stress were similar with a study conducted among physiotherapy students in Pakistan (Syed et al., 2018). They reported depression was 48.0%, anxiety (68.5%) and stress (53.2%). There was another study from Manipal Medical College showed a lower prevalence (Teh et al., 2015). They found that the prevalence of depression, anxiety, and stress among university students were 30.7%, 55.5%, and 16.6%, respectively. Nevertheless, both findings from the present study and previous findings were consistent as the most prevalence psychological distress among university students was anxiety, followed by depression and stress. The present finding also found that there was no sex difference in prevalence of depression, anxiety or stress. This was in line with a study in India as they stated that the way an individual feels stress has a same bearing whether one is a male or female (Kumari & Garita, 2012). In contrast, Fawzy and Hamed (2017) revealed that female were more vulnerable to psychological distress may be due to the fact that

female students tend to be more concerned about their performance and emotional resilience.

4.2.2 Self-Esteem

Based on Table 4.4, it showed the distribution of undergraduate students according to the items in Rosenberg Self Esteem Scale. About 70.5% of students expressed that they wish to gain more respect for themselves. Besides that, there was more than 70% of the students were satisfied with themselves as a whole, felt they have a number of good qualities, thought they able to do things as well as most other people and took positive attitude towards themselves. However, almost half of the students thought they no good at all, felt not much to be proud of and certainly feel useless at times. Only one in three of students felt that they are a failure.

Table 4.4 Distribution of respondents by self-esteem (n=265)

Items	Respondents, n (%)			
	Strong Disagree	Disagree	Agree	Strongly Agree
1. On the whole, I am satisfied with myself	14 (5.3)	48 (18.1)	133 (50.2)	70 (26.4)
2. At times I think I am no good at all*	44 (16.6)	64 (24.2)	119 (44.9)	38 (14.3)
3. I feel that I have a number of good qualities	15 (5.7)	39 (14.7)	142 (53.6)	69 (26.0)
4. I am able to do things as well as most other people	17 (6.4)	44 (16.6)	144 (54.3)	60 (22.6)
5. I feel I do not have much to be proud of*	42 (15.8)	96 (36.2)	93 (35.1)	34 (12.8)

Table 4.4 (Cont.) Distribution of respondents by self-esteem (n=265)

Items	Respondents, n (%)			
	Strong Disagree	Disagree	Agree	Strongly Agree
6. I certainly feel useless at times*	65 (24.5)	79 (29.8)	88 (33.2)	33 (12.5)
7. I feel that I'm a person of worth, at least on an equal plane with others	20 (7.5)	56 (21.1)	128 (48.3)	61 (23.0)
8. I wish I could have more respect for myself*	26 (9.8)	52 (19.6)	105 (39.6)	82 (30.9)
9. All in all, I am inclined to feel that I am a failure*	66 (24.9)	109 (41.1)	65 (24.5)	25 (9.4)
10. I take a positive attitude toward myself	20 (7.5)	42 (15.8)	121 (45.7)	82 (30.9)

* Reversed items

Table 4.5 showed that a majority of undergraduate students were in the normal self-esteem level (67.9%), followed by low self-esteem (24.9%) and high self-esteem (7.2%). In other words, about one in five of the students had low self-esteem where 30.3% were males and 22.2% were females. There was no significant difference in self-esteem between males and females ($t=-1.250$, $p=0.213$) by Independent samples t-test as shown in Table 4.5. This was supported in the study by Rosli et al. (2012). They stated that the lack of self-esteem differences between sex was believed associated with other factors such as environment, social, cognitive and biological. The finding of the current study was in contrast with the study conducted in Pakistan where significant difference between sex and self-esteem was found in the previous study. They discovered that male students had higher self-esteem than female students because males

comparatively more social and strong (Arshad et al., 2015). A study from Universiti Teknologi MARA demonstrated males have higher self-esteem level as compared to females as self-esteem as related to body dissatisfaction when refer to sex difference (Ahmat et al., 2018).

Table 4.5 Distribution of respondents by classification of self-esteem (n=265)

Variables	n (%)			t-value	p-value
	Male	Female	Total		
Low self-esteem (<15)	27 (30.3)	39 (22.2)	66 (24.9)		
Normal self-esteem (15-25)	54 (60.7)	126 (71.5)	180 (67.9)	-	-
High self-esteem (>25)	8 (9.0)	11 (6.3)	19 (7.2)		
Mean±SD	16.71±6.06	17.63±4.84	17.32±5.29	-1.250	0.213

4.3 Lifestyle Factors

4.3.1 Sleep Quality

Table 4.6 showed the distribution of undergraduate students by classification of sleep quality. More than half of the students (57.7%) were poor sleepers while only 42.3% were having good sleep quality. The prevalence of students with bad sleep quality was almost similar as a study conducted in Sudan which was 60.4% (Mirghani, Mohammed, Almutadha, & Ahmed, 2015). This was due to undergraduate students involved in the late night study, excessive internet use and some also consume stimulants to stay awake at night (Baert et al., 2015). No significant difference found in the sleep quality by sex (t=0.073, p=0.942). This was in line with the study conducted in United States illustrated

that students of both sex experience about the same quality of sleep (Raley, Naber, Cross, & Perlow, 2016). There was a controversial finding stated females had better sleep quality when compared with males (Tobi Seun-Fadipe & Samuel Mosaku, 2017).

Table 4.6 Distribution of respondents by classification of sleep quality (n=265)

Variables	n (%)		Total	t-value	p-value
	Male	Female			
Good sleep quality (>5)	34 (38.2)	78 (44.3)	112 (42.3)	-	-
Poor sleep quality (≤5)	55 (61.8)	98 (55.7)	153 (57.7)		
Mean±SD	6.26±2.72	6.23±2.68	6.24±2.69	0.073	0.942

4.3.2 Physical Activity

Table 4.7 showed the distribution of undergraduate students by physical activity. The five physical activities reported were vigorous-intensity activity at work, moderate-intensity at work, walk or bicycle, vigorous-intensity recreational activities and moderate-intensity recreational activities. The participation in vigorous-intensity activity at work was lowest compared to other activities which was only 22.6%. For walk or bicycle, there was about 56.6% participation followed by moderate-intensity at work (54.7%), moderate-intensity recreational activities (53.2%) and vigorous-intensity recreational activities (48.7%). On the other hand, the duration of physical activities carried out by students were mostly in the range of 20-40 minutes and 40-60 minutes. However, duration of physical activity more than 60 minutes was the lowest.

Table 4.7 Distribution of respondents by physical activity (n=265)

No.	Items	Respondents, n (%)
Activity At Work		
1.	Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like (carrying or lifting heavy loads, digging or construction work) for at least 10 minutes continuously?	
	Yes	60 (22.6)
	No	205 (77.4)
2.	In a typical week, on how many days do you do vigorous-intensity activities as part of your work? ¹	
	None	202 (76.2)
	1 time a week	6 (2.3)
	2 times a week	18 (6.8)
	≥ 3 times a week	39 (14.7)
3.	How much time do you spend doing vigorous-intensity activities at work on a typical day? ²	
	< 20 minutes	9 (15.0)
	20 – 40 minutes	24 (40.0)
	40 – 60 minutes	22 (36.7)
	> 60 minutes	5 (8.3)
4.	Does your work involve moderate-intensity activity that causes small increases in breathing or heart rate such as brisk walking (or carrying light loads) for at least 10 minutes continuously?	
	Yes	145 (54.7)
	No	120 (45.3)
5.	In a typical week, on how many days do you do moderate-intensity activities as part of your work? ¹	
	None	120 (45.3)
	1 time a week	6 (2.3)
	2 times a week	22 (8.3)
	≥ 3 times a week	117 (44.2)
6.	How much time do you spend doing moderate-intensity activities at work on a typical day? ²	
	< 20 minutes	25 (17.2)
	20 – 40 minutes	56 (38.6)
	40 – 60 minutes	58 (40.0)
	> 60 minutes	6 (4.1)

Table 4.7 (Cont.) Distribution of respondents by physical activity (n=265)

No.	Items	Respondents, n (%)
Travel To And From Places		
7.	Do you walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places?	
	Yes	150 (56.6)
	No	115 (43.4)
8.	In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places? ¹	
	None	116 (43.8)
	1 time a week	8 (3.0)
	2 times a week	13 (4.9)
	≥ 3 times a week	128 (48.3)
9.	How much time do you spend walking or bicycling for travel on a typical day? ²	
	< 20 minutes	39 (26.2)
	20 – 40 minutes	77 (51.7)
	40 – 60 minutes	30 (20.1)
	> 60 minutes	3 (2.0)
Recreational Activities		
10.	Do you do any vigorous-intensity sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like (running or football) for at least 10 minutes continuously?	
	Yes	129 (48.7)
	No	136 (51.3)
11.	In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational (leisure) activities? ¹	
	None	136 (51.3)
	1 time a week	14 (5.3)
	2 times a week	46 (17.4)
	≥ 3 times a week	69 (26.0)
12.	How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day? ²	
	< 20 minutes	6 (4.7)
	20 – 40 minutes	37 (28.7)
	40 – 60 minutes	54 (41.9)
	> 60 minutes	32 (24.8)

Table 4.7 (Cont.) Distribution of respondents by physical activity (n=265)

No.	Items	Respondents, n (%)
13.	Do you do any moderate-intensity sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, (cycling, swimming, volleyball) for at least 10 minutes continuously?	
	Yes	141 (53.2)
	No	123 (46.4)
14.	In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (leisure) activities? ¹	
	None	124 (46.8)
	1 time a week	28 (10.6)
	2 times a week	41 (15.5)
	≥ 3 times a week	72 (27.2)
15.	How much time do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day? ²	
	< 20 minutes	8 (5.7)
	20 – 40 minutes	42 (30.0)
	40 – 60 minutes	54 (38.6)
	> 60 minutes	36 (25.7)

Source: ¹Rasekhi et al., 2016; ²Franz & Feresu, 2013

In Table 4.8, there was significant difference in physical activity level between male and female ($t=4.219$, $p<0.001$). The present study found that half of the students (50.2%) were in moderate physical activities level. However, the finding from NHMS 2015 was slightly higher as they stated that the overall prevalence of physically active adults was 66.5%. In the categories of high physical activity level, the percentage of male students was higher when compared to females. There was only 15.7% of male in low physical activity level while female was 31.3%. The finding was supported by a study conducted in Manipal Medical College in India which reported that most of the male students

carried out physical activities more frequent compared to female students. Students claimed that physical activity helped them to relax and felt revitalized (Velou & Teli, 2014).

Table 4.8 Distribution of respondents by classification of physical activity (n=265)

Variables	n (%)			t-value	p-value
	Male	Female	Total		
Low physical activity	14 (15.7)	55 (31.3)	69 (26.0)	4.219	<0.001
Moderate physical activity	41 (46.1)	92 (52.3)	133 (50.2)		
High physical activity	34 (38.2)	29 (16.4)	63 (23.8)		

4.3.3 Eating Behavior

Table 4.9 showed the frequency of breakfast skipping and fast food consumption by undergraduate students throughout the week. The prevalence of breakfast skipping was 45.3% which slightly higher compared to a study conducted among high school students in Korea. They reported that rate of breakfast skipping was 26.7% and there was no difference in the prevalence of breakfast skipping between sexes (Kang & Park, 2016). The results were in line with our study stated that no significant difference between sex and breakfast skipping (t=1.939, p=0.054). The percentage of breakfast skipping between both males and females were 38.2% and 48.9% respectively. In contrast, a local study conducted in Klang discovered that females tend to skip meal as compared to males especially breakfast due to body dissatisfaction. This could be explained by females afraid to be fat and tend to skip meal in order to lose weight (Zunam et al.,

2012). According to Gan et al. (2011), they found that about 38.4% of the males and half of the females (52.4%) ate at western fast food restaurants one to three times per month (Gan et al., 2011). However, the findings of fast food consumption in current study were slightly lower (males 32.6%, females 26.7%). No significant difference was found between males and females ($t = 0.160$, $p = 0.873$). There was inconsistent with the study conducted among 274 secondary school students as they stated that female students have better dietary habits while male spend more time at outside activities and might cause them have higher risk of consuming more fast food (Zunam et al., 2012).

Table 4.9 Distribution of respondents by classification of eating behavior (n=265)

Variables	n (%)			t-value	p-value
	Male	Female	Total		
Breakfast¹					
Skipped (≤ 6)	34 (38.2)	86 (48.9)	120 (45.3)	1.939	0.054
Non-skipped (7)	55 (61.8)	90 (51.1)	145 (54.7)		
Fast food²					
Frequent (≥ 3)	29 (32.6)	47 (26.7)	76 (28.7)	0.160	0.873
Non-frequent (< 3)	60 (67.4)	129 (73.3)	189 (71.3)		

Source: ¹Chin & Mohd Nasir, 2009; ²Global School-Based Student Health Survey, 2013

4.3.4 Body Weight Status

As shown in Table 4.10, there was no significant difference in body mass index ($t=0.674$, $p=0.501$) between males and females. A majority of the respondents were normal weight (64.7%), followed by overweight (14.7%), underweight (12.4%) and obesity (8.2%) based on the classification of WHO BMI

classification (WHO, 1995). The results indicated that about one in four of the undergraduate students were overweight and obesity. According to the National Health and Morbidity Survey (NHMS) 2015, the prevalence of underweight and obesity for adults aged more than 18 years old were 6.9% and 17.7%, respectively. The prevalence of underweight in the present study was higher than the finding in NHMS (2015) while the prevalence of obesity was slightly lower. NHMS also stated the prevalence of overweight was significantly higher among males compared to females. However, it was controversial with a previous study in Nigeria which reported that female had more BMI compare to male after pubertal stage (Franz & Feresu, 2013).

Table 4.10 Distribution of respondents by classification of body mass index (n=265)

Variables	n (%)			t-value	p-value
	Male	Female	Total		
Underweight	15 (16.9)	17 (10.1)	32 (12.4)	-	-
Normal weight	50 (56.1)	117 (69.2)	167 (64.7)		
Overweight	15 (16.9)	23 (13.6)	38 (14.7)		
Obesity	9 (10.1)	12 (7.1)	21 (8.2)		
Mean±SD	23.01±5.38	22.57±4.05	22.72±4.55	0.674	0.501

Source: WHO BMI classification (WHO, 1995)

4.4 Hypothesis Testing

4.4.1 Socio-demographic Characteristics with Academic Performance

The alternative hypothesis was tested using Chi-Square Test for all the categorical variables. Based on Table 4.11, there was a no significant association between sex and academic performance ($\chi^2=2.877$, $p=0.411$). In other words, this was in line with the study conducted in Maldives stated that both sex have been

experiencing the similar learning environment. This indicated that academic performance may be due to some other factors such as their personalities, time and planning management, concentration and attendance (Imran, Mojgan, Ghavifekr, & Ahmad Zabidi, 2013). This finding was inconsistent with the previous studies as they found that male students performed better compared to female students. Females were reported to have slightly higher depression than males and this will disrupt concentration, attention and thus undermine academic performance (Nihayah et al., 2011). It was supported by a biological study stated that males had larger average brain sizes than females and thus have higher average IQ and performed better in academic. However, a significant association between sex and academic performance was showed in the study by Deliëns et al. (2014). Female students tend to have higher grades than male students. This could be explained by the fact that women more often show motivation, discipline, commitment and time management skills. Females also tend to more eager in learning, more organized and are better at multitasking (Mohamed et al., 2014). These were the most important components for a student to perform well in higher education.

In the present study, year of study was significantly associated with academic performance ($\chi^2=18.599$, $p=0.029$). The finding was consistent with the study by Maliha Nasir (2012) as increasing in age brings improvement in academic performance. A study in Arab agreed that older students would performed better they would be more mature and oriented towards their education (Mohamed et al., 2014). Older students were also reported higher levels of

motivation for learning (Maric & Sakac, 2014). In contrast, Imran et al. (2013) revealed that younger students performed better than older students as older students may face more responsibilities that may hinder their academic performance. Another reason could be explained by mature students may have more difficulties coping with the demands of learning and may lack basic skills required for effective study. No significant association between accommodation and academic performance in present study ($\chi^2=1.633$, $p=0.652$). The results were consistent with a local study conducted in Universiti Kebangsaan Malaysia (UKM). The reason could be due to students living with families may receive support physically and mentally while students living in hostel performed also may receive motivation from their colleagues and have more favorable social environment that can lead to better academic performance (Mohamed et al., 2014). There was a controversial finding from a study conducted among secondary school students stated that student's living status associated with academic performance as students living in hostel experience less parental control, which might influence academic efforts (Deliens et al., 2014).

As shown in Table 4.11, monthly household income was not significantly associated with academic performance ($\chi^2 = 8.509$, $p = 0.203$). Ahmad et al. (2015) explained that monthly household income did not directly affect students' motivation, time for studying, and their learning skills. They also stated that the culture norms allow students to remain family care until after graduation and before that most of the students receive monthly allowance. However, a positive correlation was found between family income and academic performance. Maliha

Nasir (2012) discovered that students with better income resources allow them to access to quality educational experience and better academic facilities that will influence student's academic performance. Also, they will also have additional opportunities as such private tuitions from high level instructors and advanced technical knowledge (Imran et al., 2013). Our results indicated that father's education level ($\chi^2=11.512$, $p=0.242$) and mother's education level ($\chi^2=10.752$, $p=0.293$) were not associated with student's academic performance. The findings were consistent with a study conducted in South Africa. They indicated that parenting style dimensions (parental control and parental support) are stronger predictors of academic performance instead of parental education (Necsoi, Porumbu, & Beldianu, 2013). A study conducted among secondary school students in Kuala Terengganu showed inconsistent finding which parental education was significantly associated with student's academics. Educated parents provide intellectual, economical, psychological and emotional support to their children and adjusted their learning development, and this will help students to have better academic performance. They also act as second teachers to their child and their children will more likely to work actively in their studies to follow the footsteps of their families (Bakar, Mamat, & Ibrahim, 2018). Highly educated parents often deducted a lot of time, energy, and money to help their children to perform well in academic activities. Odoh et al. (2017) also explained that educated parents tend to involve in their children' learning through interactions and had better reading materials.

Table 4.11 Association of socio-demographic characteristics with academic performance among the respondents (n = 265)

Variables	n (%)				χ^2	p
	First Class Honour	Second Upper Class Honour	Second Lower Class Honour	Third Class Honour		
Sex						
Male	9 (36.0)	43 (32.1)	23 (30.3)	14 (46.7)	2.877	0.411
Female	16 (64.0)	91 (67.9)	53 (69.7)	16 (53.3)		
Year of Study						
Year 1	11 (44.0)	36 (26.9)	25 (32.9)	12 (40.0)	18.599	0.029
Year 2	2 (8.0)	33 (24.6)	30 (39.5)	10 (33.3)		
Year 3	9 (36.0)	43 (32.1)	13 (17.1)	6 (20.0)		
Year 4	3 (12.0)	22 (16.4)	8 (10.5)	2 (6.7)		
Accommodation						
In campus	22 (88.0)	108 (80.6)	60 (78.9)	26 (86.7)	1.633	0.652
Out campus	3 (12.0)	26 (19.4)	16 (21.1)	4 (13.3)		
Monthly Household Income						
<RM2300.00	5 (20.0)	24 (17.9)	20 (26.3)	12 (40.0)	8.509	0.203
RM2300 – RM5599.99	13 (52.0)	68 (50.7)	36 (47.4)	9 (30.0)		
≥RM5600.00	7 (28.0)	42 (31.3)	20 (26.3)	9 (30.0)		
Father's Education Level						
No formal	3 (12.0)	4 (3.1)	4 (5.3)	3 (10.0)	11.512	0.242
Primary	1 (4.0)	15 (11.6)	9 (11.8)	7 (23.3)		
Secondary	10 (40.0)	44 (34.1)	30 (39.5)	7 (23.3)		
Tertiary	11 (44.0)	66 (51.2)	33 (43.4)	13 (43.4)		
Mother's Education Level						
No formal	1 (4.0)	7 (5.4)	8 (10.5)	2 (6.7)	10.752	0.293
Primary	3 (12.0)	9 (7.0)	10 (13.2)	6 (20.0)		
Secondary	14 (56.0)	58 (45.0)	32 (42.1)	9 (30.0)		
Tertiary	7 (28.0)	55 (42.6)	26 (34.2)	13 (43.3)		

4.4.2 Psychological Factors with Academic Performance

Table 4.12 showed that depression ($\chi^2=111.197$, $p<0.001$), anxiety ($\chi^2=109.672$, $p<0.001$) and stress ($\chi^2=97.490$, $p<0.001$) were significantly associated with academic performance. The results was in line with a local study

in Malacca which reported that depression, anxiety and stress have a high detrimental effect to students including dropouts from school, increased suicidal tendency, relationship problems and unable to work effectively (Teh et al., 2015). Depression interrupts an individual's thoughts processes, emotional response and daily life activities. According to Sharma and Pandey (2017), depression interrupts student's thoughts processes, emotional response and daily life activities. This was supported a study by Basha (2017) explained that depression interfere student's physical health such as headache and fatigability which will in turn affect their academic performance. A study conducted in Iran also discovered that depressed mood interfere student's attention and thoughts for cognitive tasks which then leads to academic failure (Yousefi et al., 2010).

Table 4.12 Association of depression, anxiety, stress with academic performance among the respondents (n = 265)

Variables	n (%)				χ^2	p
	First Class Honour	Second Upper Class Honour	Second Lower Class Honour	Third Class Honour		
Depression						
Normal	19 (79.2)	91 (67.9)	27 (35.5)	1 (3.3)	111.197	<0.001
Mild	2 (8.3)	14 (10.5)	11 (14.5)	4 (13.4)		
Moderate	2 (8.3)	16 (12.0)	18 (35.5)	15 (50.0)		
Severe	1 (4.2)	12 (8.9)	8 (10.5)	1 (3.3)		
Extremely severe	0 (0.0)	1 (0.7)	12 (4.0)	9 (30.0)		
Anxiety						
Normal	18 (72.0)	62 (46.3)	3 (3.9)	2 (6.7)	109.672	<0.001
Mild	3 (12.0)	17 (12.7)	11 (14.5)	1 (3.3)		
Moderate	2 (8.0)	28 (20.8)	24 (31.6)	3 (10.0)		
Severe	2 (8.0)	17 (12.7)	14 (18.4)	4 (13.3)		
Extremely severe	0 (0.0)	10 (7.5)	24 (31.6)	20 (66.7)		

Table 4.12 (Cont.) Association of depression, anxiety, stress with academic performance among the respondents (n = 265)

Variables	n (%)				χ^2	p
	First Class Honour	Second Upper Class Honour	Second Lower Class Honour	Third Class Honour		
Stress						
Normal	20 (80.0)	90 (67.2)	31 (40.8)	2 (6.7)	97.490	<0.001
Mild	1 (4.0)	19 (14.2)	19 (25.0)	7 (23.3)		
Moderate	2 (8.0)	15 (11.2)	17 (22.4)	10 (33.3)		
Severe	2 (8.0)	6 (4.5)	7 (9.2)	8 (26.7)		
Extremely severe	0 (0.0)	4 (2.9)	2 (2.6)	3 (10.0)		

There was significant relationship between anxiety and academic performance as students with high level of anxiety have shorter memory span, reduce attention, lack confidence, and poor reasoning power. It can also cause more interference on cognitive such as mind blocking, worries and fears (Vitasari et al., 2010). Stress not only affect student's mental and physical health but also impact their ability to perform schoolwork effectively (Kumari & Garita, 2012). Therefore, a study conducted among 376 undergraduate students in Universiti Putra Malaysia found a weak negative relationship between stress and their academic performance (Elias et al., 2011). High level of stress bring detrimental effects to students such as interfered student's preparation, concentration and performance (Sohail, 2016). However, there was a study conducted by Farhan (2015) indicated that no association between stress and academic performance. Students get familiar to the course contents and build up the knowledge base of the enrolled course. Thus, there was no effect on academic performance. Another local study in University Kebangsaan Malaysia (UKM) reported inconsistent

findings. They discovered that higher level of stress will motivated students to achieved higher and better academic performance (Siraj et al., 2014).

A one-way ANOVA was conducted to compare the academic performance and stress among undergraduate students in the present study. Table 4.13 showed that there was a statistically significant difference between academic performance [F(3, 261)=47.808, p<0.001]. A turkey post hoc test was revealed in Table 4.14 which indicated that stress was statistically lower for the first class honour (6.00 ± 4.47), second upper class honour (10.72 ± 6.59) and second lower class honour (16.74 ± 6.77) compared to third class honour (23.27 ± 6.98). Specifically, our results suggested that students who score better in academics have lower stress.

Table 4.13 Difference (one-way ANOVA) in academic performance by stress among the respondents (n = 265)

Variable	Stress	F-value	p-value
	Mean ± SD		
Academic Performance			
First Class Honour	6.00 ± 4.47	47.808	<0.001
Second Upper Class Honour	10.72 ± 6.59		
Second Lower Class Honour	16.74 ± 6.77		
Third Class Honour	23.27 ± 6.98		

Table 4.14 Post-hoc test for academic performance with stress among the respondents (n = 265)

Academic Performance		Mean difference	p-value
First Class Honour	Second Upper Class Honour	-4.716**	0.006
	Second Lower Class Honour	-10.737**	<0.001
	Third Class Honour	-17.267**	<0.001

Table 4.14 (Cont.) Post-hoc test for academic performance with stress among the respondents (n = 265)

Academic Performance		Mean difference	p-value
Second Upper Class Honour	First Class	4.716**	0.006
	Honour		
	Second Lower Class Honour	-6.020**	<0.001
Second Lower Class Honour	Third Class	-12.550**	<0.001
	Honour		
	First Class	10.737**	<0.001
Third Class Honour	Second Upper Class Honour	6.020**	<0.001
	Third Class	-6.530**	<0.001
	Honour		
Third Class Honour	First Class	17.267**	<0.001
	Honour		
	Second Upper Class Honour	12.550**	<0.001
Third Class Honour	Second Lower Class Honour	6.530**	<0.001
	Third Class		
	Honour		

Based on Table 4.15, the present study found that self-esteem was significantly associated with academic performance ($\chi^2=48.542$, $p<0.001$) which was in line with previous studies by Aryana (2010). They stated that higher self-esteem help individuals to promote changes and open to new things. It was supported by a study conducted among 600 students from University of Swat Pakistan. Students tend to feel more confident and had higher academic outcome (Feroz, 2018). In contrast, a study discovered there was no association between self-esteem and academic performance (Ahmat et al., 2018). This might due to the differences in study cohorts and also the measures of self-esteem.

Table 4.15 Association of self-esteem with academic performance among the respondents (n = 265)

Variables	n (%)				χ^2	p
	First Class Honour	Second Upper Class Honour	Second Lower Class Honour	Third Class Honour		
Self-Esteem						
Low self-esteem (<15)	1 (4.0)	20 (14.9)	24 (31.6)	21 (70.0)		
Normal self-esteem (15-25)	22 (88.0)	101 (75.4)	48 (63.2)	9 (30.0)	48.542	<0.001
High self-esteem (>25)	2 (8.0)	13 (9.7)	4 (5.2)	0 (0.0)		

The difference in academic performance and self-esteem was examined by one-way ANOVA. As depicted in Table 4.16, there was a statistically significant difference between academic performance [$F(3, 261)=14.636, p<0.001$]. Post hoc comparisons using the turkey post hoc test indicated that the mean score for the self-esteem. There was statistically lower self-esteem for the third class honour (12.47 ± 3.97) compared to first class honour (19.84 ± 4.39), second upper class honour (18.38 ± 5.25) and second lower class honour (16.54 ± 4.79). Students with better academics tend to have higher self-esteem. However, Table 4.17 showed that there was no statistically significant difference between first class honour and second upper class honour as $p = 0.524$.

Table 4.16 Difference (one-way ANOVA) in academic performance by self-esteem among the respondents (n = 265)

Variable	Self-esteem Mean ± SD	F-value	p-value
Academic Performance			
First Class Honour	19.84 ± 4.39	14.636	<0.001
Second Upper Class Honour	18.38 ± 5.25		
Second Lower Class Honour	16.54 ± 4.79		
Third Class Honour	12.47 ± 3.97		

Table 4.17 Post-hoc test for academic performance with self-esteem among the respondents (n = 265)

Academic Performance		Mean difference	p-value
First Class Honour	Second Upper Class Honour	1.459	0.524
	Second Lower Class Honour	3.301**	0.020
	Third Class Honour	7.373**	<0.001
Second Upper Class Honour	First Class Honour	-1.459	0.524
	Second Lower Class Honour	1.841**	0.047
	Third Class Honour	5.914**	<0.001
Second Lower Class Honour	First Class Honour	-3.301**	0.020
	Second Upper Class Honour	-1.841**	0.047
	Third Class Honour	4.073**	0.001
Third Class Honour	First Class Honour	-7.373**	<0.001
	Second Upper Class Honour	-5.914**	<0.001
	Second Lower Class Honour	-4.073**	0.001

4.4.3 Lifestyle Factors with Academic Performance

Based on Table 4.18, there was significant association between sleep quality and academic performance ($\chi^2=68.086$, $p<0.001$). A study conducted by Baert et al. (2015) reported the similar findings. They discovered that night rest is essential to improve cognitive performance. Individuals with less sleep will reduce the brain ability to process memory and learning. Thus, they will score lower in their academics. Zeek et al. (2015) reported that adequate sleep will enable students recall information more rapidly while inadequate sleep decreases alertness and attention. It also interferes with the function of brain structures and thus impair physical, cognitive, and emotional functions (Mirghani et al., 2015). There was a study conducted among 200 nursing students in Egypt showed that two thirds of students with good sleep quality have good academic score (Kamel, Desouky, Lawend, Abu, & Awed, 2015). Sleep act as a key role as it helps brain to integrate new knowledge and forms new associations. A controversial finding was found in a study by Alhazzani et al. (2018). They reported that no association was detected between sleep quality and academic performance among students. The reason could be due to overlook student's emotion variable such as mood that could affect the consistency of the results.

Table 4.18 Association of sleep quality with academic performance among the respondents (n = 265)

Variables	n (%)				χ^2	p
	First Class Honour	Second Upper Class Honour	Second Lower Class Honour	Third Class Honour		
Sleep Quality						
Good sleep quality	22 (88.0)	75 (56.0)	14 (18.4)	1 (3.3)	68.086	<0.001
Poor sleep quality	3 (12.0)	59 (44.0)	62 (81.6)	29 (96.7)		

Table 4.19 showed the results of one-way ANOVA to compare the academic performance and sleep quality among undergraduate students in current study. There was a statistically significant difference between academic performance [$F(3, 261)=26.121, p<0.001$]. A turkey post hoc test revealed that sleep quality was statistically better for the first class honour (3.88 ± 1.86), second upper class honour (5.55 ± 2.62) and second lower class honour (7.38 ± 2.17) compared to third class honour (8.40 ± 2.08). The findings indicated that students performed poorer in their academics with poorer sleep quality. However, there was no statistically significant differences between second lower class honour and third class honour ($p = 0.195$) based on Table 4.20.

Table 4.19 Difference (one-way ANOVA) in academic performance by sleep quality among the respondents (n = 265)

Variable	Sleep quality Mean $\pm$ SD	F-value	p-value
Academic Performance			
First Class Honour	3.88 $\pm$ 1.86	26.121	<0.001
Second Upper Class Honour	5.55 $\pm$ 2.62		
Second Lower Class Honour	7.38 $\pm$ 2.17		
Third Class Honour	8.40 $\pm$ 2.08		

Table 4.20 Post-hoc test for academic performance with sleep quality among the respondents (n = 265)

Academic Performance		Mean difference	p-value
First Class Honour	Second Upper Class Honour	-1.672**	0.008
	Second Lower Class Honour	-3.502**	<0.001
	Third Class Honour	-4.520**	<0.001
Second Upper Class Honour	First Class Honour	1.672**	0.008
	Second Lower Class Honour	-1.829**	<0.001
	Third Class Honour	-2.848**	<0.001
Second Lower Class Honour	First Class Honour	3.502**	<0.001
	Second Upper Class Honour	1.829**	<0.001
	Third Class Honour	-1.018	0.195
Third Class Honour	First Class Honour	4.520**	<0.001
	Second Upper Class Honour	2.848**	<0.001
	Second Lower Class Honour	1.018	0.195

As depicted in Table 4.21, there was a significant association between physical activity and academic performance ($\chi^2=14.260$, $p=0.027$). The result was consistent with the study by Franz and Feresu (2013) stated that physical activity helps to increase academic performance due to an increase in neurotransmitters such as serotonin. This was consistent with a study conducted in Chile (Maureira Cid, 2017). They explained that physical activity helps to improve brain structures especially working memory and executive functions by development of new cerebral blood vessels, increased synaptic density and neurogenesis. Increased in neurogenesis will leads to an improvement in cognitive functions such as attention, planning and inhibition. A study conducted among 544 undergraduate students in Turkey also found positive association between physical activity and academic performance. Iri et al. (2016) discovered that physical activities induce arousal and lessen boredom, which lead to increase classroom concentration and attention spans and thus enhancing in-class behavior. In addition, Elmagd et al. (2015) revealed that physical activities not only help in cognitive functions but also promote a range of benefits including general health and social behavior. The findings from previous studies were mostly consistent as there was significant relationship between physical activity and academic performance. A study in India reported by Velou and Teli (2014) reported that no studies have found that unfavorable effects of physical activity towards academic performance. Physical activities also can help to reduce stress level and inevitably speed up the learning process. However, the difference in academic performance and physical activity was examined by one-way ANOVA. As depicted in Table 4.22, there was no

statistically significant difference between academic performance [F(3, 261)=0.695, p=0.556].

Table 4.21 Association of physical activity with academic performance among the respondents (n = 265)

Variables	n (%)				χ^2	p
	First Class Honour	Second Upper Class Honour	Second Lower Class Honour	Third Class Honour		
Physical Activity						
Low physical activity	1 (4.0)	31 (23.1)	25 (32.9)	12 (40.0)	14.260	0.027
Moderate physical activity	17 (68.0)	71 (53.0)	36 (47.4)	9 (30.0)		
High physical activity	7 (28.0)	32 (23.9)	15 (19.7)	9 (30.0)		

Table 4.22 Difference (one-way ANOVA) in academic performance by physical activity among the respondents (n = 265)

Variable	Physical activity	F-value	p-value
	Mean ± SD		
Academic Performance			
First Class Honour	2334.40 ± 1856.61	0.695	0.556
Second Upper Class Honour	1988.21 ± 1813.48		
Second Lower Class Honour	1754.05 ± 1687.03		
Third Class Honour	2033.33 ± 2215.53		

Table 4.23 showed breakfast skipping was significantly associated with academic performance ($\chi^2=9.046$, p=0.029). According to Valladares et al. (2016), they found that there was an effects of breakfast on academic performance. This was supported by another study conducted among 1652 Korean adolescents as

they stated that students consuming breakfast had significantly better grades (Kang & Park, 2016). They discovered that breakfast skipping increase the risk of undernourished and it appeared to increase student's absenteeism. Increased in absenteeism will cause diminished in attention and indeed affect their academic performance. A positive association was also demonstrated between breakfast intake and the students' academics in a study by Taha and Rashed (2017). They explained that breakfast enhances intellectual capacity, concentration, attention and academic performance. A local study conducted in Shah Alam revealed that breakfast omission adds to poor glycemic level. Breakfast keep a student active and alert. Those students who skipped breakfast might have difficulty in attending long lectures and impact their understanding power. Furthermore, breakfast skipping can result into nutrient deficiency and poor nutritional status which can lead to unconsciousness, anxiety and poor memory (Sundaram et al., 2018). However, there was a controversial findings by Zunam et al. (2012) indicated that no association between breakfast skipping and academic performance. This could be explained by other confounder factor such as family factors that influence both student's eating behavior and academic performance.

Table 4.23 Association of eating behavior with academic performance among the respondents (n = 265)

Variables	n (%)				χ^2	p
	First Class Honour	Second Upper Class Honour	Second Lower Class Honour	Third Class Honour		
Breakfast						
Skipped	7 (28.0)	55 (41.0)	39 (51.3)	19 (63.3)	9.046	0.029
Non-skipped	18 (72.0)	79 (59.0)	37 (48.7)	11 (36.7)		

Table 4.23 (Cont.) Association of eating behavior with academic performance among the respondents (n = 265)

Variables	n (%)				χ^2	p
	First Class Honour	Second Upper Class Honour	Second Lower Class Honour	Third Class Honour		
Fast Food Frequent	9 (36.0)	36 (26.9)	20 (26.3)	11 (36.7)	2.014	0.570
Non-frequent	16 (64.0)	98 (73.1)	56 (73.7)	19 (63.3)		

Fast food consumption was found to be not significantly associated with academic performance ($\chi^2=2.014$, $p=0.570$) which in line with the study conducted among 289 medical students in India. The discrepancies might be due to the data collected were based on the self-reported questionnaire and also small sample size. There were a few studies reported more consumption of fast food was associated with significant poorer performance. Frequent fast food consumption can increase an individual response times and lead to metabolic diseases such as insulin resistance and obesity (Kim, Sim, Park, & Kong, 2016). High fat foods have been linked with alterations in cognitive as it will impair function in the frontal, limbic, and hippocampal systems, which perform learning and memory. High fat food will also cause weight gain and increase risk of getting chronic diseases. Thus, it will lead to absenteeism and lower academic performance (Zunam et al., 2012).

As shown in Table 4.24, the findings of the present study did not found any significant association in body weight status with academic performance ($\chi^2=6.802$, $p=0.340$). A study conducted in Nigeria also agreed that BMI was not

related to academic performance. They explained that conducive learning environment and genetic would influence academic performance rather than body mass profile (Atare & Nkangude, 2014).

Table 4.24 Association of body weight status with academic performance among the respondents (n = 265)

Variables	n (%)				χ^2	p
	First Class Honour	Second Upper Class Honour	Second Lower Class Honour	Third Class Honour		
BMI						
Underweight	5 (20.0)	15 (11.6)	7 (9.3)	5 (17.2)	6.802	0.340
Normal weight	14 (56.0)	85 (65.9)	54 (72.0)	14 (48.3)		
Overweight /obesity	6 (24.0)	29 (22.5)	14 (18.7)	10 (34.5)		

In contrast, the study by Deliens et al. (2013) reported that BMI was negatively associated with academic performance as increases in BMI may have affected students’ cognitive performances. The reason could possibly be explained by students who lacked discipline to maintain weight was equally not disciplined to perform well academically. This was supported by a study conducted among 395 adolescents in Chile. They discovered that both males and females with higher BMI were less likely to earn high academic performance obesity was associated with poorer cognitive function especially executive functioning skills. Besides that, it will also affect inhibitory control and working memory which are critical for academic performance. They reported that normal BMI students was 3.72 times more likely to have high academic performance than obese students (Garcia-Hermoso & Marina, 2017). A one-way ANOVA was conducted between subjects to compare the academic performance and BMI

among undergraduate students in the present study. There was no statistically significant difference between academic performance [F(3, 254)=0.395, p=0.757].

Table 4.25 Difference (one-way ANOVA) in academic performance by body weight status among the respondents (n = 265)

Variable	Body Mass	F-value	p-value
	Index		
Mean ± SD			
Academic Performance			
First Class Honour	22.24 ± 4.25	0.395	0.757
Second Upper Class Honour	22.74 ± 4.75		
Second Lower Class Honour	22.57 ± 3.85		
Third Class Honour	23.49 ± 5.57		

CHAPTER 5

CONCLUSION, LIMITATIONS AND RECOMMENDATIONS

5.1 Conclusion

This cross-sectional study was conducted among 265 undergraduate students (66.4 females and 33.6% males) from two selected universities in Selangor. In the present study, 50.6% of the undergraduate students were classified as second upper class honour, followed by second lower class honour (28.7%) and third class honour (11.3%). Only 9.4% of students had rewarded as first class honour.

Several factors were found to be significantly associated with academic performance among undergraduate students. Year of study ($\chi^2=18.599$, $p=0.029$), depression ($\chi^2=111.197$, $p<0.001$), anxiety ($\chi^2=109.672$, $p<0.001$), stress ($\chi^2=97.490$, $p<0.001$) and self-esteem ($\chi^2=48.542$, $p<0.001$) were significantly associated with academic performance.

Furthermore, sleep quality ($\chi^2=68.086$, $p<0.001$), physical activity ($\chi^2=14.260$, $p=0.027$) and breakfast skipping ($\chi^2=9.046$, $p=0.029$) were significantly associated with academic performance. No significant associations were found between sex, accommodation, monthly household income, father's education level, mother's education level, fast food consumption, body weight status with academic performance among undergraduate students.

In conclusion, it is important to improve academic performance among undergraduate students and the factors that may influence the student's academic performance should be studied in depth in order to have a better understanding of these associations.

5.2 Limitations

There are several limitations to be taken into account while interpreting the findings of the present study. Firstly, the present study was a cross-sectional study which prevents the inference of causality. Secondly, the study location of the present study only involved the undergraduate students in selected universities in Selangor. Hence, the findings may not be able to be generalized and reflected the condition in general population.

Furthermore, the self-administered questionnaires were used in the current study. The nature of self-administered questionnaire itself depends on the respondents' memory and their honesty in answering the questionnaires. Thus, it might have recalled bias susceptibility.

In addition, there were lack of cooperation between students and researcher. Some of the students were unwilling to take part in this study as well as they did not return back the questionnaire to be analyzed. Hence, it spent more time, money and manpower in order to achieve the minimum sample size of the present study.

5.3 Recommendations

In future research, it is recommended to have longitudinal studies conducted in Malaysia. This is due to research with longitudinal design able to determine the real causal-effect between these variables and academic performance in undergraduate students. Besides that, it is suggested to wider the area of study to cover the undergraduate students from different states in Malaysia. Hence, the findings can have higher precision and be generalized to a broader population of undergraduate students in Malaysia.

According to the findings of the present study, future intervention programs are suggested to improve academic performance of undergraduate students. These programs may aim to provide the knowledge and associated factors on academic performance in order to achieve better academic performance among the students.

In addition, the insignificant findings in the present study implied that the relationships of academic performance with other factors such as sex, accommodation, monthly household income, father's education level, mother's education level, fast food consumption, body weight status are yet to be reconfirmed. Hence, more local studies should be carried out to fill current knowledge gap.

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APPENDICES

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

Research title	: Associations Between Socio-Demographic Characteristics, Psychological Factors, Lifestyle Factors and Academic Performance Among Undergraduate Students in Selangor
Study Site	: Selangor
JKEUPM Ref No.	: JKEUPM-2018-412
Researcher	: Lim Hooi Sian
Supervisor	: Dr. Chin Yit Siew

Documents received and reviewed with reference to the above study:

1. Ethics Application Form, Version 1 dated 15/11/2018
2. Respondent Information Sheet & Consent (English), Version 2 dated 3/12/2018
3. Respondent Information Sheet & Consent (Malay), Version 2 dated 3/12/2018
4. Proposal (English), Version 2 dated 13/12/2018
5. Questionnaires/ Interviews (English), Version 1 dated 15/11/2018
6. Questionnaires/ Interviews (Malay), Version 1 dated 15/11/2018
7. Curriculum Vitae of:
 - a. Dr. Chin Yit Siew

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

Decision by JKEUPM:

- ☒ **Approved**
- ☒ **Permission MUST BE OBTAINED from the respective hospitals/ institutions before conducting the research**
- ☐ **Disapproved**

Please note that the approval is **VALID UNTIL 19 DECEMBER 2019**

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.

5/25/2019

Yahoo Mail - RE: UPM/FPSK/JPD/PKK4999A/9 Research study in University of Nottingham Malaysia

RE: UPM/FPSK/JPD/PKK4999A/9 Research study in University of Nottingham Malaysia

From: PAN YAN (Pan.Yan@nottingham.edu.my)

To: chinys@upm.edu.my

Cc: yvonnekim1210@gmail.com; Kang-Nee.Ting@nottingham.edu.my; nurulhuda_ali96@yahoo.com

Date: Tuesday, 12 February 2019, 5:10 pm GMT+8

Dear Dr Chin,

There should be fine that your students come and collect the data as long as our students signed the informed consent before the data collection.

Best wishes,

Pan Yan (PhD, PGCHE, fellow of HEA)

5/25/2019

Yahoo Mail - RE: UPM/FPSK/JPD/PKK4999A/9 Research study in University of Nottingham Malaysia

RE: UPM/FPSK/JPD/PKK4999A/9 Research study in University of Nottingham Malaysia

From: PAN YAN (Pan.Yan@nottingham.edu.my)

To: nurulhuda_ali96@yahoo.com

Date: Tuesday, 19 February 2019, 12:27 pm GMT+8

Hi Huda,

We don't have official approved letter for such activity. Perhaps you can include my email in your appendix. Unless you have collaborators in our University, and then the study will need to get ethics approval from our ethic committee. In your situation, you are just recruiting our students as volunteers, hence, as long as you get the ethics approval from your university and you get signed informed consent before the study, it should be fine from our side.

Best wishes,

Pan Yan (PhD, PGCHE, fellow of HEA)

APPENDIX C – Information sheets, Consent form and Questionnaire

Reference No. /No. Rujukan



DEPARTMENT OF NUTRITION AND DIETETICS
JABATAN PEMAKANAN DAN DIETITIK
FACULTY OF MEDICINE AND HEALTH SCIENCES
FAKULTI PERUBATAN DAN SAINS KESIHATAN

PKK 4999A
FINAL YEAR PROJECT
PROJEK ILMIAH TAHUN AKHIR

SELF-ADMINISTERED QUESTIONNAIRES
BORANG SOAL SELIDIK

Associations between socio-demographic characteristics, psychological factors, lifestyle factors and academic performance among undergraduate students in Selangor

Perkaitan Antara Faktor Sosio-Demografi, Faktor Psikologikal dan Faktor Cara Kehidupan dengan Prestasi Akademik dalam Kalangan Pelajar Universiti di Selangor

Associations between socio-demographic factors, lifestyle factors, body weight status and night eating syndrome among undergraduate students in Selangor

Perkaitan Antara Faktor Sosio-Demografi, Faktor Cara Kehidupan dan Index Jisim Badan dengan Sindrom Makan Malam dalam Kalangan Pelajar Universiti di Selangor

Researcher / Penyelidik: Lim Hooi Sian & Nurul Huda Ali

Course of Study / Program: B. Sc. (Nutrition and Community Health)

Supervisor / Penyelia: Dr. Chin Yit Siew

Date / Tarikh: _____ (dd) / _____ (mm) / _____ (yyyy)

Instructions / Arahan:

Questionnaires include ten sections. Please complete ALL items in EACH section by selecting the answer that corresponds to you. All information provided is confidential and only for research purposes only. Your honesty and sincerity in providing information is highly needed. All the co-operation is greatly appreciated.

Soal selidik merangkumi sepuluh bahagian. Sila lengkapkan SEMUA item dalam SETIAP bahagian dengan memilih jawapan yang bertepatan dengan anda. Segala maklumat yang diberikan adalah sulit dan hanya untuk tujuan penyelidikan semata-mata. Kejujuran dan keikhlasan anda dalam memberi maklumat adalah amat diperlukan. Segala kerjasama yang diberikan amat dihargai dan didahului dengan ucapan jutaan terima kasih.



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

- a) Associations between socio-demographic characteristics, psychological factors, lifestyle factors and academic performance among undergraduate students in Selangor.
- b) Associations between socio-demographic factors, lifestyle factors, body weight status and night eating syndrome (NES) among undergraduate students in Selangor.

2. INTRODUCTION

This study involved the research of 2 topics from two different students of Bachelor of Science (Nutrition and Community Health) from Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. This study is expected to be completed within a year. An approximate of 267 undergraduate students will be recruited in this study. This study has been approved by the Ethic Committee for Research Involving Human Subject (JKEUPM). A brief introduction about the topics are as follows:

- Academic performance can be defined as the extent to which a student has achieved certain goals in their studies. It also refers to behavior change in terms of cognitive, affective and psychomotor. Undergraduate students experienced various challenges related to their educational, social and lifestyle changes that can have a positive and negative impact on student health. This will affect their academic performance and bring an impact on their future career success. There are several factors related to student's academic performance such as stress, eating behavior, sleep quality and social influences. However, there are limited studies on academic performance among undergraduate students in Malaysia. Therefore, the purpose of this study is to examine the associations between socio-demographic characteristics, psychological factors, lifestyle factors and academic performance among undergraduate students in Selangor.
- Night eating syndrome (NES) refers to an eating disorder that can be characterized by breakfast skipping, increased appetite for food in the evening and urge to eat after waking up from the sleep. This is followed by eating at night. The food consumed after the evening meal are usually in excess. This syndrome is also accompanied and associated with sleep disturbance and psychological distress. With the challenges to adapt with new environment and having to cope with hectic schedule, stressful events faced in university could alter student's eating behavior and this might leads to NES. NES is quite prevalent in general population, however, there are limited studies being done in Malaysia regarding this issue, particularly among university students. Therefore, this research will be conducted with the aim to study NES in-depth as well as identifying the associations between socio-

demographic factors, lifestyle factors, body weight status and night eating syndrome (NES) among undergraduates in Selangor.

3. WHAT WILL YOU HAVE TO DO?

Students are required to read and understand about this study in “Respondent’s Information Sheet”. Your participation in this study is voluntary and are entitled to withdraw from this study at any time without penalty. If you voluntarily agree to participate, you are required to sign the respondents’ consent form. Upon completion of the respondent’s consent form, kindly return it to the researcher. Your participation in this study will take an approximate of 30 minutes.

Things that you need to do are as follows;

- a) Complete a set of questionnaire comprises of socio-demographic factors, psychological factors and lifestyle factors. After completing the questionnaire, please return it to the researcher.
- b) Your height, weight, body fat percentage and waist circumference will be measured by the researcher.

4. WHO SHOULD NOT PARTICIPATE IN THE STUDY?

- Non-Malaysian
- Postgraduate students
- Pregnant/ Breastfeeding students
- Having physical and mental disabilities
- Taking medication (example: *Anti-depressants, Atenolol, Lorcaserin*) that would potentially affects the sleeping pattern and appetite

5. WHAT WILL BE THE BENEFITS OF THIS STUDY?

a) TO YOU AS THE SUBJECT?

You will be able to know your body composition such as your recent height, weight and body fat percentage. Once you have successfully completed this study, goodies will be given to you as a token of appreciation for your participation in this study.

b) TO THE INVESTIGATOR?

Information obtained from this study will be used by the researcher to identify:

- The associations between socio-demographic characteristics, psychological factors, lifestyle factors and academic performance among undergraduate students in Selangor.
- The associations between socio-demographic factors, lifestyle factors, body weight status and night eating syndrome (NES) among undergraduate students in Selangor.

The findings from this study could also serve as a baseline data in planning an intervention program to enhance the academic performance as well as promote healthy eating behaviors among university students.

6. WHAT ARE THE POSSIBLE RISK?

This research has a *minimal risk*. It involves survey via questionnaires and anthropometric measurements of height, weight, body fat percentage and waist circumference that are *likely to cause only a slight discomfort*.

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

Students will not be identified individually if the findings of this research were to be published later. All information provided will be remained confidential and used for academic purposes only. Researchers will not disclose your name or any personal information to third parties.

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

If you need further information regarding this research, please feel free to contact:

Researcher 1:

Lim Hooi Sian

Tel: 0164517056 (H/P)

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Researcher 2:

Nurul Huda Ali

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E-mail: chinys@upm.edu.my

Department of Nutrition and Dietetics

Faculty of Medicine and Health Sciences

Universiti Putra Malaysia

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

9. CONSENT

I Identity Card No.
addresss.....
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)

SECTION A: Please fill in the relevant questions.

Bahagian A: Sila isi atau tanda pada pernyataan yang berkenaan.

1. Age / Umur : _____

2. Sex / Jantina :

☐ Male / Lelaki ☐ Female / Perempuan

3. Ethnicity / Bangsa :

☐ Malay / Melayu

☐ Chinese / Cina

☐ Indian / India

☐ Others (Please specify) / Lain-lain (Sila nyatakan): _____

4. Marital Status / Status perkahwinan :

☐ Single / Bujang

☐ Married / Berkahwin

5. Course of Study / Program Pengajian : _____

6. Year of Study / Tahun Pengajian :

☐ First year / Tahun pertama

☐ Second year / Tahun kedua

☐ Third year / Tahun ketiga

☐ Fourth year / Tahun keempat

7. Accommodation / Tempat kediaman :

☐ In Campus / Dalam kampus

☐ Out Campus / Luar kampus

☐ Home with family / Rumah bersama keluarga

8. CGPA (previous semester) / CGPA (semester lepas) : _____

9. Monthly Household Income / Pendapatan isi rumah : RM _____

10. Household Size / Bilangan ahli keluarga : _____

11. Types of Sponsorship / Jenis Tajaan :

- ☐ PTPTN Loan / *Pinjaman PTPTN*
- ☐ Scholarship / *Biasiswa*
- ☐ Parents / *Ibu bapa*
- ☐ Extra Income (eg. part time job) / *Pendapatan tambahan (cth: kerja sambilan)*
- ☐ Others (Please specify) / *Lain-lain (Sila nyatakan):* _____

12. Father's Education Level:

- ☐ No formal education / *Tidak bersekolah formal*
- ☐ Primary education / *Sekolah rendah*
- ☐ Secondary education / *Sekolah menengah*
- ☐ Pre-University / *Pra-Universiti (A-level/ Foundation/ STPM/ Diploma)*
- ☐ Tertiary education / *Pengajian Tinggi (Bachelor / Master / PhD)*

13. Mother's Education Level:

- ☐ No formal education / *Tidak bersekolah formal*
- ☐ Primary education / *Sekolah rendah*
- ☐ Secondary education / *Sekolah menengah*
- ☐ Pre-University / *Pra-Universiti (A-level/ Foundation/ STPM/ Diploma)*
- ☐ Tertiary education / *Pengajian Tinggi (Bachelor / Master / PhD)*

SECTION B: Please fill in the relevant questions. Choose one answer only.

Bahagian B: Sila isi atau tanda pada pernyataan yang berkenaan. Pilih satu jawapan sahaja.

1. Do you currently smoke tobacco on a daily on daily basis, less than daily or not at all?
Adakah anda kini, sedang merokok tembakau pada setiap hari, kurang dari sehari atau langsung tidak merokok?

- ☐ Daily * / Setiap Hari → End of Section
☐ Less Than Daily / Kurang Dari Setiap Hari → Go to Question 2, Skip Question 3
☐ Not at all **/ Langsung tidak merokok → Go to Question 3

2. Have you smoked tobacco daily in the past?
Adakah anda merokok tembakau setiap hari pada masa yang lalu?

- ☐ Yes / Ya ☐ No/ Tidak

3. In the past, have you smoked tobacco on a daily basis, less than daily or not at all?
Pada masa yang lalu, adakah anda merokok tembakau pada setiap hari, kurang dari sehari atau langsung tidak merokok?

- ☐ Daily * / Setiap Hari
☐ Less Than Daily / Kurang Dari Setiap Hari
☐ Not at all **/ Langsung tidak merokok**

***Daily: Smoking at least one tobacco product every day or nearly every day over a period of a month or more**

****Not at all: Rare instances of smoking (tried once or twice in a lifetime)**

SECTION C: Please fill in the relevant questions. Choose one answer only.

Bahagian C: Sila isi atau tanda pada pernyataan yang berkenaan. Pilih satu jawapan sahaja.

1. Have you ever consumed alcoholic beverages?
Pernahkah anda minum sebarang minuman beralkohol?

- ☐ Yes / Ya → Go to Question 2 ☐ No/ Tidak → End of Section

2. How frequent do you consume alcoholic beverages?
Berapa kerapkah anda mengambil minuman beralkohol?

- ☐ More than 4 days a week / Lebih dari 4 hari dalam seminggu
☐ 1 to 4 days a week / 1 hingga 4 hari dalam seminggu
☐ ≤ 3 days a month / Kurang atau Sama dengan 3 hari sebulan

***1 alcoholic drink: 1 can/ small bottle (~285 ml) of beer or 1 glass (~120 ml) of wine or 1 measure (~30 ml) of spirits.**

SECTION D

Bahagian D

Please read each statement and tick either number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There is no right or wrong answers.

Sila baca setiap kenyataan di bawah dan tandakan pada nombor 0, 1, 2 atau 3 bagi menggambarkan keadaan anda sepanjang minggu yang lalu. Tiada jawapan yang betul atau salah.

The rating scale is as follows:

Skala pemarkahan adalah seperti berikut:

0 Did not apply to me at all

Tidak langsung menggambarkan keadaan saya

1 Applied to me to some degree, or some of the time

Sedikit atau jarang-jarang menggambarkan keadaan saya

2 Applied to me to a considerable degree, or a good part of time

Banyak atau kerap kali menggambarkan keadaan saya

3 Applied to me very much, or most of the time

Sangat banyak atau sangat kerap menggambarkan keadaan saya

	Statement	0	1	2	3
1.	I found it hard to wind down <i>Saya dapati diri saya sukar ditenteramkan</i>				
2.	I was aware of dryness of my mouth <i>Saya sedar mulut saya terasa kering</i>				
3.	I couldn't seem to experience any positive feeling at all <i>Saya tidak dapat mengalami perasaan positif sama sekali</i>				
4.	I experienced breathing difficulty (eg, excessively rapid breathing, breathlessness in the absence of physical exertion) <i>Saya mengalami kesukaran bernafas (contohnya pernafasan yang laju, tercungap-cungap walaupun tidak melakukan senaman fizikal)</i>				
5.	I found it difficult to work up the initiative to do things <i>Saya sukar untuk mendapatkan semangat bagi melakukan sesuatu perkara</i>				
6.	I tended to over-react to situations <i>Saya cenderung untuk bertindak keterlaluan dalam sesuatu keadaan</i>				
7.	I experienced trembling (eg, in the hands) <i>Saya rasa menggeletar (contohnya pada tangan)</i>				
8.	I felt that I was using a lot of nervous energy <i>Saya rasa saya menggunakan banyak tenaga dalam keadaan cemas</i>				
9.	I was worried about situations in which I might panic and make a fool of myself <i>Saya bimbang keadaan di mana saya mungkin menjadi panik dan melakukan perkara yang membodohkan diri sendiri</i>				
10.	I felt that I had nothing to look forward to <i>Saya rasa saya tidak mempunyai apa-apa untuk diharapkan</i>				

	Statement	0	1	2	3
11.	I found myself getting agitated <i>Saya dapati diri saya semakin gelisah</i>				
12.	I found it difficult to relax <i>Saya rasa sukar untuk relaks</i>				
13.	I felt down-hearted and blue <i>Saya rasa sedih dan murung</i>				
14.	I was intolerant of anything that kept me from getting on with what I was doing <i>Saya tidak dapat menahan sabar dengan perkara yang menghalang saya meneruskan apa yang saya lakukan</i>				
15.	I felt I was close to panic <i>Saya rasa hampir-hampir menjadi panik/cemas</i>				
16.	I was unable to become enthusiastic about anything <i>Saya tidak bersemangat dengan apa jua yang saya lakukan</i>				
17.	I felt I wasn't worth much as a person <i>Saya tidak begitu berharga sebagai seorang individu</i>				
18.	I felt that I was rather touchy <i>Saya rasa yang saya mudah tersentuh</i>				
19.	I was aware of the action of my heart in the absence of physical exertion (eg, sense of heart rate increase, heart missing a beat) <i>Saya sedar tindakbalas jantung saya walaupun tidak melakukan aktiviti fizikal (contohnya kadar denyutan jantung bertambah, atau denyutan jantung berkurangan)</i>				
20.	I felt scared without any good reason <i>Saya berasa takut tanpa sebab yang munasabah</i>				
21.	I felt that life was meaningless <i>Saya rasa hidup ini tidak bermakna</i>				

SECTION E

Bahagian E

Below is a list of statements dealing with your general feelings about yourself. Please tick either number 0, 1, 2 or 3 which indicates how much the statement applied to you.

Di bawah adalah senarai pernyataan mengenai perasaan anda terhadap diri sendiri. Sila tandakan pada nombor 0, 1, 2 atau 3 bagi menggambarkan keadaan anda.

0 Strongly Agree / Sangat Setuju

1 Agree / Setuju

2 Disagree / Tidak Setuju

3 Strongly Disagree / Sangat Tidak Setuju

No.	Statement	0	1	2	3
1.	On the whole, I am satisfied with myself <i>Selalunya saya berpuas hati dengan diri saya</i>				
2.	At times I think I am no good at all <i>Kadangkala saya terfikir yang saya bukan baik selalu</i>				
3.	I feel that I have a number of good qualities <i>Saya rasa yang saya ada beberapa kualiti yang baik</i>				
4.	I am able to do things as well as most other people <i>Saya boleh melakukan tugas sama baiknya seperti orang lain</i>				
5.	I feel I do not have much to be proud of <i>Saya boleh merasakan yang tidak banyak yang boleh saya banggakan</i>				
6.	I certainly feel useless at times <i>Adakalanya saya rasa diri saya ini tidak berguna langsung</i>				
7.	I feel that I'm a person of worth, at least on an equal plane with others <i>Saya rasa saya seorang yang mempunyai nilai sekurang-kurangnya sama seperti orang lain</i>				
8.	I wish I could have more respect for myself <i>Hajat saya ialah saya lebih menghormati diri saya</i>				
9.	All in all, I am inclined to feel that I am a failure <i>Saya selalu rasa yang saya ini seorang yang gagal</i>				
10.	I take a positive attitude toward myself <i>Saya mengambil sikap yang positif terhadap diri saya</i>				

SECTION F

Bahagian F

The following questions relate to your usual sleep habits during the past month only. Your answers should indicate the most accurate reply for the majority of days and nights in the past month. Please answer all questions.

Soalan-soalan berikut adalah berkaitan dengan tabiat tidur anda yang biasa dalam tempoh bulan yang lalu (30 hari yang lalu) sahaja. Jawapan-jawapan anda harus menunjukkan keadaan yang paling tepat bagi kebanyakan waktu siang dan malam dalam tempoh bulan yang lalu. Sila jawab semua soalan.

1.

During the past month, what time have you usually gone to bed at night?
Dalam tempoh bulan yang lalu, pada pukul berapakah biasanya anda masuk tidur pada waktu malam?

BED TIME _____

WAKTU MASUK TIDUR _____

2.	During the past month, how long (in minutes) has it usually takes you to fall asleep each night? <i>Dalam tempoh bulan yang lalu, berapa lamakah (dalam minit) biasanya anda ambil untuk mula tidur pada setiap malam?</i> NUMBER OF MINUTES _____ JUMLAH MINIT _____				
3.	During the past month, what time have you usually gotten up in the morning? <i>Dalam tempoh bulan yang lalu, pada pukul berapakah biasanya anda bangun dari katil pada waktu pagi?</i> GETTING UP TIME _____ WAKTU BANGUN DARI KATIL _____				
4.	During the past month, how many hours of actual sleep did you get at night? (This may be different than the number of hours you spent in bed.) <i>Dalam tempoh bulan yang lalu, berapa jamkah sebenarnya anda tidur pada waktu malam? (Ini mungkin berbeza dengan jumlah jam yang anda gunakan untuk berbaring di atas katil.)</i> HOURS OF SLEEP PER NIGHT _____ JUMLAH JAM TIDUR UNTUK SATU MALAM _____				
5.	During the past month, how often have you had trouble sleeping because you... <i>Dalam tempoh bulan yang lalu, berapa kerapkah anda telah mengalami masalah tidur kerana anda ...</i>	Not during the past month <i>Tidak dalam tempoh yang lalu</i>	Less than once a week <i>Kurang daripada sekali seminggu</i>	Once or twice a week <i>Satu atau dua kali seminggu</i>	Three or more times a week <i>Tiga kali atau lebih seminggu</i>
a.	Cannot get to sleep within 30 minutes <i>Tidak boleh tidur dalam tempoh 30 minit</i>				
b.	Wake up in the middle of the night or early morning <i>Bangun pada waktu tengah malam atau awal pagi</i>				
c.	Have to get up to use the bathroom <i>Perlu bangun tidur untuk menggunakan tandas</i>				
d.	Cannot breathe comfortably <i>Tidak boleh bernafas dengan selesa</i>				

		Not during the past month <i>Tidak dalam tempoh yang lalu</i>	Less than once a week <i>Kurang daripada sekali seminggu</i>	Once or twice a week <i>Satu atau dua kali seminggu</i>	Three or more times a week <i>Tiga kali atau lebih seminggu</i>
e.	Cough or snore loudly <i>Batuk atau berdengkur dengan kuat</i>				
f.	Feel too cold <i>Rasa begitu sejuk</i>				
g.	Feel too hot <i>Rasa begitu panas</i>				
h.	Have bad dreams <i>Mengalami mimpi yang buruk</i>				
i.	Have pain <i>Mengalami kesakitan</i>				
j.	Other reason(s), please describe: How often during the past month have you had trouble sleeping because of this? <i>Alasan (-alasan) yang lain, sila terangkan: Berapa kerapkah dalam tempoh bulan yang lalu anda telah mengalami masalah tidur kerana alasan tersebut?</i>				
		Very good <i>Sangat baik</i>	Fairly good <i>Agak baik</i>	Fairly bad <i>Agak buruk</i>	Very bad <i>Sangat buruk</i>
6.	During the past month, how would you rate your sleep quality overall? <i>Dalam tempoh bulan yang lalu, bagaimanakah anda nilai kualiti tidur anda secara keseluruhan?</i>				

		Not during the past month <i>Tidak dalam tempoh yang lalu</i>	Less than once a week <i>Kurang daripada sekali seminggu</i>	Once or twice a week <i>Satu atau dua kali seminggu</i>	Three or more times a week <i>Tiga kali atau lebih seminggu</i>
7.	During the past month, how often have you taken medicine to help you sleep (prescribed or “over the counter”)? <i>Dalam tempoh bulan yang lalu, berapa kerapkah anda telah mengambil ubat untuk membantu anda untuk tidur (ubat yang dinasihati oleh doktor anda atau ubat yang dibeli sendiri tanpa preskripsi)?</i>				
8.	During the past month, how often have you had trouble staying awake while driving, eating meals, or engaging in social activity? <i>Dalam tempoh bulan yang lalu, berapa kerapkah anda mengalami masalah untuk berjaga semasa memandu kenderaan, makan, atau melibatkan diri dengan aktiviti sosial?</i>				
		No problem at all <i>Tiada masalah langsung</i>	Only a very slight problem <i>Hanya sedikit masalah</i>	Somewhat of a problem <i>Agak banyak masalah</i>	A very big problem <i>Satu masalah yang besar</i>
9.	During the past month, how much of a problem has it been for you to keep up enough enthusiasm to get things done? <i>Dalam tempoh bulan yang lalu, berapa banyakkah masalah anda untuk memastikan anda cukup semangat untuk menyelesaikan kerja?</i>				

SECTION G

BAHAGIAN G

We are interested to know the amount of time you spend doing different types of physical activities in a typical week. Please answer these questions even if you do not consider yourself to be a physically active person.

Kami akan menyoal anda berkenaan dengan tempoh masa yang anda luangkan untuk melakukan pelbagai kegiatan aktiviti fizikal yang berbeza dalam satu minggu yang biasa. Sila jawab soalan-soalan ini walaupun anda menganggap diri anda tidak aktif.

Activity At Work

Aktiviti Fizikal Berkaitan Pekerjaan

No. No.	Questions Soalan	Response Maklumbalas	Code Kod
1.	Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like (carrying or lifting heavy loads, digging or construction work) for at least 10 minutes continuously? <i>Adakah pekerjaan anda melibatkan aktiviti kerja berat yang mengakibatkan peningkatan yang banyak dalam kadar pernafasan ataupun denyutan jantung seperti berlari, membawa atau mengangkat barang yang berat, menggali, mencangkul, menuai, berkebun, memburu atau melakukan kerja pembinaan sekurang-kurangnya 10 minit secara berterusan?</i>	Yes 1 <i>Ya 1</i> No 2 <i>Tidak 2</i> If 'No', go to P4 <i>Jika 'Tidak', sila ke P4</i>	P1
2.	In a typical week, on how many days do you do vigorous-intensity activities as part of your work? <i>Biasanya dalam seminggu, berapa harikah anda melakukan kerja-kerja berat dalam pekerjaan anda?</i>	Number of days <i>Jumlah hari </i>	P2
3.	How much time do you spend doing vigorous-intensity activities at work on a typical day? <i>Pada hari biasa yang anda lakukan kerja berat, berapa lamakah anda melakukannya?</i>	Hours : Minutes : <i>Jam : Minit : </i>	P3 (a-b)
4.	Does your work involve moderate-intensity activity that causes small increases in breathing or heart rate such as brisk walking (or carrying light loads) for at least 10 minutes continuously? <i>Adakah pekerjaan anda melibatkan aktiviti kerja sederhana yang mengakibatkan peningkatan yang sedikit dalam kadar pernafasan ataupun denyutan jantung seperti berjalan pantas, membawa barang yang ringan, memancing, membuat kerja rumah, mencuci kereta atau mengecat rumah sekurang-kurangnya 10 minit secara berterusan?</i>	Yes 1 <i>Ya 1</i> No 2 <i>Tidak 2</i> If 'No', go to P7 <i>Jika 'Tidak', sila ke P7</i>	P4

No. No.	Questions Soalan	Response Maklumbalas	Code Kod
5.	In a typical week, on how many days do you do moderate-intensity activities as part of your work? <i>Biasanya dalam seminggu, berapa harikah anda melakukan kerja-kerja sederhana dalam pekerjaan anda</i>	Number of days <i>Jumlah hari </i>	P5
6.	How much time do you spend doing moderate-intensity activities at work on a typical day? <i>Pada hari biasa yang anda lakukan kerja sederhana, berapa lamakah anda melakukannya?</i>	Hours : Minutes : <i>Jam : Minit</i> :	P6 (a-b)
Travel To And From Places Aktiviti Fizikal Berkaitan Perjalanan			
The next questions exclude the physical activities at work that you have already mentioned. Now I would like to ask you about the usual way you travel to and from places. For example to work, for shopping, to market, to place of worship. <i>Soalan-soalan seterusnya tidak termasuk aktiviti fizikal semasa bekerja yang telah anda nyatakan. Sekarang, saya ingin bertanya mengenai kaedah yang biasa anda gunakan untuk bergerak dari satu tempat ke tempat yang lain (seperti ke tempat kerja, pasar, membeli-belah, masjid, dan sebagainya).</i>			
No. No.	Questions Soalan	Response Maklumbalas	Code Kod
7.	Do you walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places? <i>Adakah anda berjalan atau berbasikal secara berterusan sekurang-kurangnya 10 minit untuk menuju ke, dan dari sesuatu tempat?</i>	Yes 1 <i>Ya 1</i> No 2 <i>Tidak 2</i> If 'No', go to P10 <i>Jika 'Tidak', sila ke P10</i>	P7
8.	In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places? <i>Dalam satu minggu yang biasa, berapa harikah anda berjalan atau berbasikal secara berterusan sekurang kurangnya 10 minit untuk menuju ke, dan dari sesuatu tempat?</i>	Number of days <i>Jumlah hari </i>	P8

No. No.	Questions Soalan	Response Maklumbalas	Code Kod
9.	How much time do you spend walking or bicycling for travel on a typical day? <i>Dalam satu hari yang biasa, berapa lamakah anda berjalan atau berbasikal untuk bergerak dari satu tempat ke tempat yang lain?</i>	Hours : Minutes [] [] : [] [] Jam : Minit [] [] : [] []	P9 (a-b)
Recreational Activities <i>Aktiviti Fizikal Pada Waktu Lapang</i>			
The next questions exclude the work and transport activities that you have already mentioned. Now I would like to ask you about sports, fitness and recreational activities (leisure). <i>Soalan-soalan seterusnya tidak termasuk aktiviti semasa bekerja dan semasa perjalanan yang telah anda nyatakan. Sekarang, saya ingin bertanya tentang aktiviti yang anda lakukan untuk rekreasi, kecergasan, dan sukan.</i>			
No. No.	Questions Soalan	Response Maklumbalas	Code Kod
10.	Do you do any vigorous-intensity sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like (running or football) for at least 10 minutes continuously? <i>Pada masa lapang, adakah anda melakukan aktiviti sukan, kecergasan atau riadah yang lasak yang mengakibatkan peningkatan yang banyak dalam kadar pernafasan ataupun denyutan jantung, seperti berlari, jogging, aerobik atau bermain bola sepak, sekurang kurangnya 10 minit secara berterusan?</i>	Yes 1 <i>Ya 1</i> No 2 <i>Tidak 2</i> If 'No', go to P13 <i>Jika 'Tidak', sila ke P13</i>	P10
11.	In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational (leisure) activities? <i>Biasanya dalam seminggu pada waktu lapang, berapa harikah anda melakukan aktiviti-aktiviti sukan, kecergasan atau riadah yang lasak?</i>	Number of days [] <i>Jumlah hari []</i>	P11
12.	How much time do you spend doing vigorous-intensity sports, fitness or recreational activities on a typical day? <i>Dalam satu hari yang biasa, berapa lamakah anda melakukan aktiviti-aktiviti sukan, kecergasan atau riadah yang lasak?</i>	Hours : Minutes [] [] : [] [] Jam : Minit [] [] : [] []	P12 (a-b)

No. No.	Questions Soalan	Response Maklumbalas	Code Kod
13.	Do you do any moderate-intensity sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, (cycling, swimming, volleyball) for at least 10 minutes continuously? <i>Pada masa lapang, adakah anda melakukan aktiviti sukan, kecergasan atau riadah yang sederhana yang mengakibatkan peningkatan yang sedikit dalam kadar pernafasan ataupun denyutan jantung, seperti berjalan pantas, berbasikal, berenang, menanam pokok bunga atau bermain bola tampar, sekurang-kurangnya 10 minit secara berterusan?</i>	Yes 1 <i>Ya 1</i> No 2 <i>Tidak 2</i> If 'No', go to P16 <i>Jika 'Tidak', sila ke P16</i>	P13
14.	In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (leisure) activities? <i>Biasanya dalam seminggu pada waktu lapang, berapa harikah anda melakukan aktiviti-aktiviti sukan, kecergasan atau riadah yang sederhana?</i>	Number of days <i>Jumlah hari </i>	P14
15.	How much time do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day? <i>Dalam satu hari yang biasa, berapa lamakah anda melakukan aktiviti-aktiviti sukan, kecergasan atau riadah yang sederhana?</i>	Hours : Minutes : <i>Jam : Minit</i> :	P15 (a-b)
Sedentary Behaviour Aktiviti Sedentari Atau Tidak Aktif			
The following question is about sitting or reclining at work, at home, getting to and from places, or with friends including time spent (sitting at a desk, sitting with friends, travelling in car, bus, train, reading, playing cards or watching television), but do not include time spent sleeping. <i>Soalan berikut adalah berkaitan dengan aktiviti duduk atau baring/sandar di tempat kerja, di rumah, semasa dalam perjalanan, atau semasa bersama rakan-rakan. Contohnya, duduk menulis, mengguna komputer, duduk bersama rakanrakan, perjalanan dalam kereta, bas, keretapi, duduk membaca, bermain kad atau menonton televisyen, tetapi tidak termasuk waktu tidur.</i>			
16.	How much time do you usually spend sitting or reclining on a typical day? <i>Dalam satu hari yang biasa, berapakah jumlah masa yang anda gunakan untuk duduk atau baring/bersandar?</i>	Hours : Minutes : <i>Jam : Minit</i> :	P16 (a-b)

SECTION H

Bahagian H

The following questions are about your dietary behavior. Please choose **one** of the choices and **circle** it.

Berikut adalah soalan mengenai tingkah laku makan anda. Sila pilih satu jawapan dan bulatkannya.

No.	Statement	Number of days in a week							
		0	1	2	3	4	5	6	7
1a.	How frequent do you consume <u>breakfast</u> ? <i>Berapa kerapkah anda mengambil sarapan pagi?</i>	0	1	2	3	4	5	6	7
1b.	How frequent do you consume <u>morning tea</u> ? <i>Berapa kerapkah anda mengambil minum pagi?</i>	0	1	2	3	4	5	6	7
1c.	How frequent do you consume <u>lunch</u> ? <i>Berapa kerapkah anda mengambil makan tengahari?</i>	0	1	2	3	4	5	6	7
1d.	How frequent do you consume <u>afternoon tea</u> ? <i>Berapa kerapkah anda mengambil minum petang?</i>	0	1	2	3	4	5	6	7
1e.	How frequent do you consume <u>dinner</u> ? <i>Berapa kerapkah anda mengambil makan malam?</i>	0	1	2	3	4	5	6	7
1f.	How frequent do you consume <u>supper</u> ? <i>Berapa kerapkah anda mengambil makan lewat malam?</i>	0	1	2	3	4	5	6	7
2.	Please list out 3 types of foods or beverages that you usually take in between of main meals (snacks, e.g. tea, milk, kuih, ais cream, fruits, pisang goreng etc.) and its frequency of consumption. <i>Sila nyatakan 3 jenis makanan atau minuman utama yang biasa anda ambil di antara waktu masa makan utama (seperti teh, susu, kuih-muih, aiskrim, buah-buahan, snek bungkusan, pisang goreng dan lain-lain lagi) dan kekerapan pengambilannya.</i>								
	i.	0	1	2	3	4	5	6	7
	ii.	0	1	2	3	4	5	6	7
	iii.	0	1	2	3	4	5	6	7
3.	How frequent do you eat at western fast food restaurants (e.g. KFC, McDonald's, Pizza Hut etc.)? <i>Berapa kerapkah anda makan di restoran makanan barat (seperti KFC, McDonald's, Pizza Hut dan lain-lain)?</i>	0	1	2	3	4	5	6	7

No.	Statement	Number of days in a week							
4.	How frequent do you buy/take-away food from western fast food restaurants (e.g. KFC, McDonald's, Pizza Hut etc.)? <i>Berapa kerapkah anda membungkus/membeli dengan penghantaran (delivery) makanan dari restoran makanan barat (seperti KFC, McDonald's, Pizza Hut dan lain-lain)?</i>	0	1	2	3	4	5	6	7

SECTION I (a)

BAHAGIAN I

Please read each statement and circle from the multiple choice options.

Sila baca setiap kenyataan dan bulatkan satu jawapan dari pilihan yang diberikan.

1.

How often do you feel hungry?

Berapa kerapkah anda berasa lapar?

a. Only at meal times

Hanya pada waktu makan

b. Sometimes between meals

Kadangkala antara waktu makan

c. Often between meals

Kerap antara waktu makan

d. Almost always

Hampir selalu

2.

How frequently do you avoid "stocking up" on tempting foods?

Berapa kerapkah anda mengelakkan diri anda daripada "menyimpan" makanan yang lazat?

a. Almost never

Hampir tidak pernah

b. Seldom

Jarang

c. Moderately likely

Biasanya

d. Almost always

Hampir selalu

3.

How likely are you to consciously eat less than you want?

Adakah anda sedar bahawa anda sengaja makan kurang daripada apa yang ada inginkan?

a. Unlikely

Tidak mungkin

b. Slightly likely

Sedikit kemungkinan

c. Moderately likely

Sederhana kemungkinan

d. Very likely

Kemungkinan besar

4.

Do you go on eating binges though you are not hungry?

"Binge" adalah tabiat pemakanan yang berlebihan dan tidak terkawal. Adakah anda akan makan secara "binge" walaupun anda tidak berasa lapar?

a. Never

Tidak pernah

b. Rarely

Jarang

c. Sometimes

Kadang-kadang

d. At least once a week

Sekurang-kurangnya sekali seminggu

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5.	On a scale of 1 to 8, where 1 means no restraint in eating (eating whatever you want, whenever you want it) and 8 means total restraint (constantly limiting food intake and never “giving in”), what number would you give yourself? <i>Pada skala 1 hingga 8, dimana 1 bererti makan tanpa kawalan (makan apa-apa sahaja yang anda mahu, bila-bila masa yang anda inginkan) dan 8 bermaksud makan dengan penuh kawalan (sentiasa menghadkan diri anda daripada pengambilan makanan), apakah nombor yang akan anda berikan untuk diri anda?</i>
	1 2 3 4 5 6 7 8

SECTION I (b)

BAHAGIAN I

Please read each statement and circle from the multiple choice options. The ratings scale is as follows;

Sila baca setiap kenyataan dan bulatkan satu jawapan dari pilihan yang diberikan. Skala pemarkahan adalah seperti berikut;

1. Definitely False/ Langsung Tidak Benar

2. Mostly False/ Kebanyakannya Tidak Benar

3. Mostly True/ Kebanyakannya Benar

4. Definitely True/ Sangat Benar

No.	Statement/ Kenyataan	Scale/ Skala			
1.	When I smell a delicious food, I find it very difficult to keep from eating, even if I have just finished a meal. <i>Apabila saya menghidu bau daging bakar atau sekeping daging yang enak, saya berasa amat sukar untuk menahan diri saya daripada makan, walaupun saya baru sahaja selesai makan.</i>	1	2	3	4
2.	I deliberately take small helpings as a means of controlling my weight. <i>Saya sengaja makan hanya sebahagian kecil sesuatu hidangan sebagai cara untuk mengawal berat badan saya.</i>	1	2	3	4
3.	When I feel anxious, I find myself eating. <i>Apabila saya berasa gelisah, saya mendapati diri saya akan makan.</i>	1	2	3	4
4.	Sometimes when I start eating, I just can't seem to stop. <i>Kadangkala saya seolah-olah tidak dapat menghentikan diri apabila saya mulai makan.</i>	1	2	3	4
5.	Being with someone who is eating often makes me hungry enough to eat also. <i>Bersama-sama dengan seseorang yang sering makan menjadikan saya juga berasa lapar dan ingin makan.</i>	1	2	3	4
6.	When I feel blue, I often overeat. <i>Saya akan makan berlebih-lebihan apabila saya berasa sedih.</i>	1	2	3	4
7.	When I see a real delicacy, I often get so hungry that I have to eat right away. <i>Apabila saya melihat hidangan yang lazat, saya berasa begitu lapar sehingga perlu makan serta-merta.</i>	1	2	3	4

No.	Statement/ Kenyataan	Scale/ Skala			
8.	I get so hungry that my stomach often seems like a bottomless pit. <i>Saya berasa begitu lapar dimana perut saya ibarat sebuah lubang yang sangat dalam.</i>	1	2	3	4
9.	I am always hungry so it is hard for me to stop eating before I finish the food on my plate. <i>Saya sentiasa berasa lapar jadi sukar untuk saya berhenti makan sebelum saya menghabiskan makanan dalam pinggan saya.</i>	1	2	3	4
10.	When I feel lonely, I console myself by eating. <i>Apabila saya berasa kesepian, saya menenteramkan diri saya dengan makan.</i>	1	2	3	4
11.	I consciously hold back at meals in order not to weight gain. <i>Saya sedar yang saya teragak-agak untuk makan supaya berat badan saya tidak meningkat.</i>	1	2	3	4
12.	I do not eat some foods because they make me fat. <i>Saya tidak makan sesetengah makanan kerana makanan ini akan menjadikan saya gemuk.</i>	1	2	3	4
13.	I am always hungry enough to eat at any time. <i>Saya sentiasa berasa begitu lapar sehingga dapat makan pada bila-bila masa sahaja.</i>	1	2	3	4

SECTION J

BAHAGIAN J

This section reflects the eating behaviors at night. Please read every question and circle ONE answer for each question.

Bahagian ini merangkumi soalan yang menggambarkan tingkah laku pengambilan makanan pada waktu malam. Sila baca setiap soalan dan jawab dengan membulatkan jawapan yang bertepatan dengan anda

1.

How hungry are you usually in the morning?

Bagaimanakah tahap kelaparan anda pada waktu pagi?

0

1

2

3

4

Not at all

A little

Somewhat

Moderately

Very

Tidak Sama Sekali

Sedikit

Agak

Sederhana

Sangat

2.

When do you usually eat for the first time?

Bilakah pengambilan makanan pertama anda untuk sehari?

0

1

2

3

4

Before 9am

9:01 am –

12:01 am

3:01 – 6 pm

6:01 or later

Sebelum 9 am

12 pm

– 3 pm

/ atau selepasnya

9.	Other than only to use the bathroom, how often do you get up at least once in the middle of the night? <i>Selain daripada penggunaan tandas, berapa kerap anda bangun sekurang-kurangnya sekali pada tengah malam?</i> <table><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Never</td><td>Less than</td><td>About once</td><td>More than once</td><td>Always</td></tr><tr><td><i>Tidak pernah</i></td><td><i>once a week</i></td><td><i>a week</i></td><td><i>a week</i></td><td><i>Selalu</i></td></tr><tr><td></td><td><i>Kurang</i></td><td><i>Lebih kurang</i></td><td><i>Lebih</i></td><td></td></tr><tr><td></td><td><i>daripada</i></td><td><i>seminggu sekali</i></td><td><i>daripada</i></td><td></td></tr><tr><td></td><td><i>seminggu</i></td><td></td><td><i>seminggu</i></td><td></td></tr><tr><td></td><td><i>sekali</i></td><td></td><td><i>sekali</i></td><td></td></tr></table> *****IF 0 on #9, PLEASE STOP HERE***** *****JIKA ANDA JAWAB 0 DI#9, SILA BERHENTI DI SINI*****	0	1	2	3	4	Never	Less than	About once	More than once	Always	<i>Tidak pernah</i>	<i>once a week</i>	<i>a week</i>	<i>a week</i>	<i>Selalu</i>		<i>Kurang</i>	<i>Lebih kurang</i>	<i>Lebih</i>			<i>daripada</i>	<i>seminggu sekali</i>	<i>daripada</i>			<i>seminggu</i>		<i>seminggu</i>			<i>sekali</i>		<i>sekali</i>	
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	<i>sekali</i>		<i>sekali</i>																																	
10.	Do you have cravings or urges to eat snacks when you wake up at night? <i>Setelah anda bangun pada waktu malam, adakah anda mempunyai keinginan untuk mengambil makanan ringan?</i> <table><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Not at all</td><td>A little</td><td>Somewhat</td><td>Very Much So</td><td>Extremely</td></tr><tr><td><i>Tidak Ada</i></td><td><i>Sedikit</i></td><td><i>Agak</i></td><td><i>Banyak</i></td><td><i>Sangat Banyak</i></td></tr></table>	0	1	2	3	4	Not at all	A little	Somewhat	Very Much So	Extremely	<i>Tidak Ada</i>	<i>Sedikit</i>	<i>Agak</i>	<i>Banyak</i>	<i>Sangat Banyak</i>																				
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11.	Do you need to eat in order to get back to sleep when you awake at night? <i>Setelah anda bangun pada waktu malam, adakah anda perlu mengambil makanan untuk kembali tidur?</i> <table><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Not at all</td><td>A little</td><td>Somewhat</td><td>Very Much So</td><td>Extremely</td></tr><tr><td><i>Tidak perlu</i></td><td><i>Sedikit</i></td><td><i>Kadang-kadang</i></td><td><i>Sentiasa</i></td><td><i>Selalu</i></td></tr></table>	0	1	2	3	4	Not at all	A little	Somewhat	Very Much So	Extremely	<i>Tidak perlu</i>	<i>Sedikit</i>	<i>Kadang-kadang</i>	<i>Sentiasa</i>	<i>Selalu</i>																				
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12.	When you get up in the middle of the night, how often do you snack? <i>Berapa kerap anda mengambil makanan ringan semasa anda bangun pada tengah malam?</i> <table><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Never</td><td>Sometimes</td><td>About half</td><td>Usually</td><td>Always</td></tr><tr><td><i>Tidak pernah</i></td><td><i>Kadang-kadang</i></td><td><i>the time</i></td><td><i>Sentiasa</i></td><td><i>Selalu</i></td></tr><tr><td></td><td></td><td><i>Lebih kurang</i></td><td></td><td></td></tr><tr><td></td><td></td><td><i>separuh masa</i></td><td></td><td></td></tr></table> *****IF 0 on #12, PLEASE STOP HERE***** *****JIKA ANDA JAWAB 0 DI#12, SILA BERHENTI DI SINI*****	0	1	2	3	4	Never	Sometimes	About half	Usually	Always	<i>Tidak pernah</i>	<i>Kadang-kadang</i>	<i>the time</i>	<i>Sentiasa</i>	<i>Selalu</i>			<i>Lebih kurang</i>					<i>separuh masa</i>												
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13.	When you snack in the middle of the night, how aware are you of your eating? <i>Semasa anda ambil makanan ringan pada tengah malam, bagaimanakah tahap kesedaran anda tentang pengambilan makanan anda?</i> <table><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Not at all</td><td>A little</td><td>Somewhat</td><td>Very Much So</td><td>Completely</td></tr><tr><td><i>Tidak Sama Sekali</i></td><td><i>Sedikit</i></td><td><i>Agak</i></td><td><i>Banyak</i></td><td><i>Sepenuh</i></td></tr></table>	0	1	2	3	4	Not at all	A little	Somewhat	Very Much So	Completely	<i>Tidak Sama Sekali</i>	<i>Sedikit</i>	<i>Agak</i>	<i>Banyak</i>	<i>Sepenuh</i>																				
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14.	How much control do you have over your eating while you are up at night? <i>Setelah anda bangun pada waktu malam, adakah anda mampu mengawalkan pengambilan makanan anda?</i> <table><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Not at all</td><td>A little</td><td>Some</td><td>Very Much</td><td>Complete</td></tr><tr><td><i>Tidak Sama Sekali</i></td><td><i>Sedikit</i></td><td><i>Agak</i></td><td><i>Banyak</i></td><td><i>Sepenuh</i></td></tr></table>	0	1	2	3	4	Not at all	A little	Some	Very Much	Complete	<i>Tidak Sama Sekali</i>	<i>Sedikit</i>	<i>Agak</i>	<i>Banyak</i>	<i>Sepenuh</i>
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<i>Tidak Sama Sekali</i>	<i>Sedikit</i>	<i>Agak</i>	<i>Banyak</i>	<i>Sepenuh</i>												
15.	How long have your current difficulties with night eating been going on? <i>Berapa lama anda mempunyai masalah pengambilan makanan pada waktu malam?</i> _____ Months _____ Years / _____ Bulan _____ Tahun															
16.	Is your night eating upsetting you? <i>Adakah tingkah laku pengambilan makanan pada waktu malam mengecewakan anda?</i> <table><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Not at all</td><td>A little</td><td>Somewhat</td><td>Very Much So</td><td>Extremely So</td></tr><tr><td><i>Tidak Sama Sekali</i></td><td><i>Sedikit</i></td><td><i>Agak</i></td><td><i>Banyak</i></td><td><i>Sentiasa</i></td></tr></table>	0	1	2	3	4	Not at all	A little	Somewhat	Very Much So	Extremely So	<i>Tidak Sama Sekali</i>	<i>Sedikit</i>	<i>Agak</i>	<i>Banyak</i>	<i>Sentiasa</i>
0	1	2	3	4												
Not at all	A little	Somewhat	Very Much So	Extremely So												
<i>Tidak Sama Sekali</i>	<i>Sedikit</i>	<i>Agak</i>	<i>Banyak</i>	<i>Sentiasa</i>												
17.	How much have your night eating affected your life? <i>Bagaimanakah tingkah laku pengambilan makanan pada waktu malam menjejaskan kehidupan anda?</i> <table><tr><td>0</td><td>1</td><td>2</td><td>3</td><td>4</td></tr><tr><td>Not at all</td><td>A little</td><td>Somewhat</td><td>Very Much So</td><td>Extremely</td></tr><tr><td><i>Tidak Sama Sekali</i></td><td><i>Sedikit</i></td><td><i>Agak</i></td><td><i>Sangat</i></td><td><i>Sangat Banyak</i></td></tr></table>	0	1	2	3	4	Not at all	A little	Somewhat	Very Much So	Extremely	<i>Tidak Sama Sekali</i>	<i>Sedikit</i>	<i>Agak</i>	<i>Sangat</i>	<i>Sangat Banyak</i>
0	1	2	3	4												
Not at all	A little	Somewhat	Very Much So	Extremely												
<i>Tidak Sama Sekali</i>	<i>Sedikit</i>	<i>Agak</i>	<i>Sangat</i>	<i>Sangat Banyak</i>												

Question Ended. Thank You!

Soalan Tamat. Terima kasih!

(Questionnaires should to be return to researcher)

(Borang soal selidik perlu dikembalikan kepada penyelidik)

***ANTHROPOMETRIC MEASUREMENTS**

UKURAN ANTHROPOMETRI

Reading <i>Bacaan</i>	Height (cm) <i>Tinggi (cm)</i>	Weight (kg) <i>Berat (kg)</i>	BMI (kg/m²) <i>BMI (kg/m²)</i>	Waist circumference (cm) <i>Ukur lilit pinggang (cm)</i>	Body fat percentage (%) <i>Peratus lemak badan (%)</i>
1					
2					
Average <i>Purata</i>					

*This section will be filled in by the researchers