



UNIVERSITI PUTRA MALAYSIA

***FACTORS ASSOCIATED WITH PHYSICAL ACTIVITY LEVEL AMONG
UNDERGRADUATE STUDENTS IN UNIVERSITY PUTRA MALAYSIA***

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BY

PARISA SADAT MODARESI

**This project submitted as one of the course requirements for degree
of Bachelor of Science (Nutrition and Community Health)
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All praise is due to Allah, the Lord of the Worlds.

The Beneficent, the Merciful.

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Abstract

FACTORS ASSOCIATED WITH PHYSICAL ACTIVITY LEVEL AMONG UNDERGRADUATE STUDENTS IN UNIVERSITY PUTRA MALAYSIA

Parisa Sadat Modaresi

Physical activity is very important in maintaining health and quality of life. A cross sectional study was carried out to determine the physical activity level among students at Faculty of Medicine and Health Science, University Putra Malaysia (UPM). The respondents who fulfill the criteria (undergraduate students, aged 18-25 years old and Malaysian students) were recruited for this study. Assessment of physical activity was carried out using long version of the international Physical Activity Questionnaire (long IPAQ). A total of 150 respondents; which consist of Malay (82%), Chinese (6%) and Indian (12%) were involved in this study that represented by female at 93.3% and male at 6.7%. The study result shows that most of the respondents had moderate (37.3%) to high (36.7%) physical activity. There were no relationship between sociodemographic gender ($\chi^2= 2.310$, $p>0.05$), ethnicity ($\chi^2=3.665$, $p>0.05$), study program ($\chi^2=1.505$, $p>0.05$), year of study ($\chi^2=14.521$, $p<0.05$) and accommodation ($\chi^2=0.426$, $p>0.05$) and physical activity were not significant. In conclusion, there was no significant relationship between sociodemographic characteristic while there is a significant association between year of study and physical activity. There was no significant relationship between health risk behavior with physical activity and also there was no significant association between psychosocial factors and physical activity. However, there was significant association between self-efficacy and physical activity level. There were several limitations in this

study that could affect the study findings. Among them the cross-sectional study design unable to suggest any causal relationship between dependent and independent variables. Besides, there is a tendency to overestimate activity due to self-reporting and honesty of the respondents while answering the questionnaires. There are few recommendations for future study, if a researcher wants to determine physical activity level an individual, one should use some tools such as pedometer or accelerometer to assess objective method to increase the accuracy of results. Secondly, a researcher should make sure about the gender equality in selecting respondents, so that the researcher can interpret the data by gender accurately when there is balanced number of male and female.

Abstrak

FAKTOR- FAKTOR YANG BERKAITAN DENGAN TAHAP AKTIVITI FIZIKAL DALAM KALANGAN PELAJAR PRASISWAZAH DI UNIVERSITI PUTRA MALAYSIA

Parisa Sadat Modaresi

Aktiviti fizikal sangat penting dalam mengekalkan kesihatan dan kualiti hidup. Kajian keratan rentas dilakukan untuk menentukan tahap aktiviti fizikal di kalangan pelajar Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia (UPM). Responden yang memenuhi kriteria (pelajar prasiswazah, berumur 18-25 tahun dan pelajar Malaysia) telah diambil untuk kajian ini. Penilaian aktiviti fizikal dijalankan dengan menggunakan Soal Selidik Aktiviti Fizikal Antarabangsa versi Panjang (*Long IPAQ*). Sejumlah 150 orang responden iaitu Melayu (82%), Cina (6%) dan India (12%) terlibat di dalam kajian ini yang merangkumi 93.3% perempuan dan 6.7% lelaki. Dapatan kajian menunjukkan bahawa kebanyakan responden mempunyai aktiviti fizikal yang sederhana (37.3%) hingga tinggi (36.7%). Walaubagaimanapun, tiada hubungan antara sosiodemografi jantina ($\chi^2 = 2.310, p > 0.05$), etnik ($\chi^2 = 3.665, p > 0.05$), program pengajian ($\chi^2 = 1.505, \chi^2 = 14.521, p < 0.05$) dan tempat penginapan ($\chi^2 = 0.426, p > 0.05$) dengan aktiviti fizikal adalah tidak signifikan. Sebagai kesimpulan, tidak terdapat hubungan yang signifikan di antara ciri-ciri sosiodemografi manakala terdapat hubungan yang signifikan di antara tahun pengajian dan aktiviti fizikal. Tiada hubungan yang signifikan di antara tingkahlaku risiko kesihatan dengan aktiviti fizika dan juga tidak

terdapat hubungan yang signifikan di antara faktor psikososial dan aktiviti fizikal. Walau bagaimanapun, terdapat hubungan yang signifikan antara keberkesanan diri dan tahap aktiviti fizikal. Terdapat beberapa batasan dalam kajian ini yang boleh memberi kesan terhadap dapatan kajian. Di antaranya adalah reka bentuk kajian keratan rentas tidak dapat mencadangkan hubungan kait di antara pembolehubah bergantung dan bebas. Selain itu, terdapat kecenderungan untuk melebihkan aktiviti kerana pelaporan diri dan kejujuran responden ketika menjawab soal selidik. Terdapat beberapa cadangan untuk kajian di masa depan. Jika penyelidik ingin menentukan tahap aktiviti fizikal seseorang, ia harus menggunakan beberapa alat seperti pedometer atau pecutan untuk menilai kaedah objektif bagi meningkatkan ketepatan dapatan. Kedua, penyelidik harus memastikan kesaksamaan dalam memilih jantina responden supaya penyelidik dapat menafsirkan data dengan tepat mengikut jantina jika terdapat jumlah lelaki dan wanita yang seimbang.

CHAPTER 1

INTRODUCTION

1.1 Background

According to the World Health Organization, physical activity is characterized as any body movement and development created by skeletal muscles that requires energy and vitality use. Sedentary behavior (absence of physical movement) has been identified as the fourth top risk factors for worldwide mortality (6% of mortality rate all around the world) (WHO,2010). The expression "physical movement" should not be mixed up with "exercise". Exercise is a subcategory of physical movement that is planned, organized, repetitive and purposeful as in the sense that the improvement or maintenance of one or more components of physical fitness is the objective (WHO, 2010).

Physical activity incorporates workout and different exercises including body movement and are done as a feature of playing, working, active transportation, house errands and recreational activities (WHO, 2012). Physical activity is a critical part of daily life, and various studies have analyzed the impact of being active has on one's apparent personal satisfaction and quality of life (Gill et al., 2013; Lowe et al., 2014). For instance, Eichorn, Bruner, Short, & Abraham, (2018) showed that specific disease

is less likely to happen to people who consolidate physical activity into their daily life schedules, successfully enhancing well-being and health-related quality of life (Eichorn, Bruner, Short, & Abraham, 2014).

Regular and adequate level of physical activity in adults are key supporters of vitality and are essential for weight control as shown in various investigations. Moreover, physical activity has shown to diminish the risk of cardiovascular illness and other constant illnesses, including diabetes mellitus, hypertension, heftiness and osteoporosis (Maher et al., 2014). As indicated by the WHO guideline (2010), an adult aged 18 to 64 years should perform no less than 150 min/week of moderate level of aerobic physical activity, or 75 min/week of vigorous physical activity, or a proportionate mix of moderate-and vigorous physical activity, which is equivalent to total physical activity level of at least 600 metabolic equivalent minutes every week (MET-minutes/week) or 10 MET-hours/week (WHO, 2010).

The prevalence of obesity has achieved a critical level in many developing countries. Based, on the National Health and Morbidity Surveys (NHMS) completed in 2006, 2011 and 2015, an increasing trend of overweight and obesity prevalence was seen among Malaysian adults aged 18 years and above with 29.1% and 14.5% in 2006, 29.4% and 15.1% in 2011, 30.0% and 17.7% in 2015, respectively.

According to a systematic analysis of global data, the prevalence of overweight and obesity in Malaysia (11.4% in males; 16.7% in females) was seen to be lower than that of Western nations, for example, in Australia (27.5% in males; 29.8% in females) and in the United States (31.7% in males; 33.9% in females). However, the prevalence of obesity was three times higher than in other Asian nations, for example, India (3.7% in males; 4.2% in females), China (3.8% in males; 5.0% in females), Taiwan (4.3% in males; 6.4% in females) and Japan (4.5% in males; 3.3% in females) (Fricke et al., 2017).

Overweight and obesity have been linked to different factors, including low physical activity, unhealthy diet, alcohol intake, financial stabilities and hereditary factors (Chan & Woo, 2010). Changes in individual way of life practices. For example, an absence of physical activity and sedentary associated with fast urbanization, may prompt an expanding prevalence of overweight and obese people.

Statistics from the NHMS demonstrate that despite Malaysian adults aged 18 years and above are physically active than before, Malaysia is currently positioned as southeast Asia's fattest country as indicated by a recent report by the WHO (2015), with the rates of overweight and obese people being 43.8% and 48.6%, respectively (NHMS, 2017).

1.2 Problem statement

In Malaysia, the National Health and Morbidity Survey (2017) reported that the prevalence of being overweight and obese among young adults is 20.7 and 5.8 respectively. The prevalence of overweight adults in Malaysia appears to be higher than the level reported in other Asian countries, such as Thailand, China and Japan. However, this health problem is not restricted only to the Malaysian adults, as among the adolescents, the prevalence of overweight and obesity range from 5% to 26%, depending on the methods used to define overweight and obesity, age, ethnicity, gender and locality (NHMS, 2017).

Nowadays, physical inactivity and sedentary lifestyle are major concerns in many countries including Malaysia which is due to urbanization and industrialization where the machine and technologies do most of the work (MDG, 2010). Lack of physical activity is a global health hazard which lead to chronic diseases and is increasing rapidly in both developed and developing countries. Studies have shown that sedentary lifestyle is associated with increased risk of cardio vascular disease (CVD), and all- cause mortality even in the young age population (Miller & Noland, 2017).

In Malaysia, data from the National Health Morbidity Survey (2015) reported that nearly 43.7% of all adults age 18 years old and above did not engage in any physical activity or exercise at all. In other word, there were 44 out of 100 adults who are physically inactive. This high rate of physical inactivity implies that a large number of Malaysian are at risk of several major chronic diseases (NHMS, 2015).

Studies of physical activity among young adults are quite limited in Malaysia. Due to the increasing number of students who are physically inactive (MOH, 2010), it is very important to investigate the psychological and health behavioral factors and the barriers toward physical activity (Rajappan, Selvaganapathy, & Liew, 2015). The main objective of this study is to determine the factors associated with physical activity and level of physical activity among students in University Putra Malaysia.

1.3 Research questions

1. What is the physical activity level among undergraduate students in University Putra Malaysia?
2. Is there any association between socio demographic, psychosocial and health risk behavior factors with physical activity level.

1.4 Objectives of study

1.4.1 General objective

To determine factors associated with physical activity level among undergraduate students in University Putra Malaysia

1.4.2 Specific objectives

1. To assess socio-demographic characteristics (age, sex, ethnicity, study field, on or off campus living) among undergraduate students.
2. To determine physical activity level among undergraduate students.
3. To assess health risk behavioral factors (smoking habits, alcohol consumption and eating behavior) among undergraduate students.
4. To assess psychosocial factors (depression, stress and self-efficacy) among undergraduate students.
5. To determine the associations between sociodemographic, psychosocial and health risk behavioral factors with physical activity level

1.5 Hypotheses

There are associations between socio-demographic characteristics, health risk behavioral factor and psychosocial factors with physical activity level among undergraduate university students in University Putra Malaysia.

1.6 Significance of the study

The findings of this study benefit society. For instance, increasing people's awareness about physical activity and health related issue. Considering that physical activity is becoming one of the significant issues in this modern era especially among students. The data for this study is collected from Malaysian university students. This study is beneficial for the researchers to know the relationship between health-related factors and psychosocial factors with regards to physical activity level. The findings in this study can be a base for the future studies. The results of the study may help policy makers or any stakeholder to develop policies and improve on the existing programs to encourage higher physical activity level among young population and also reducing one of the risk factors (physical inactivity) to chronic diseases and eventually morbidity rate.

1.7 Research framework

Factors associated with physical activity among undergraduate students in University Putra Malaysia.

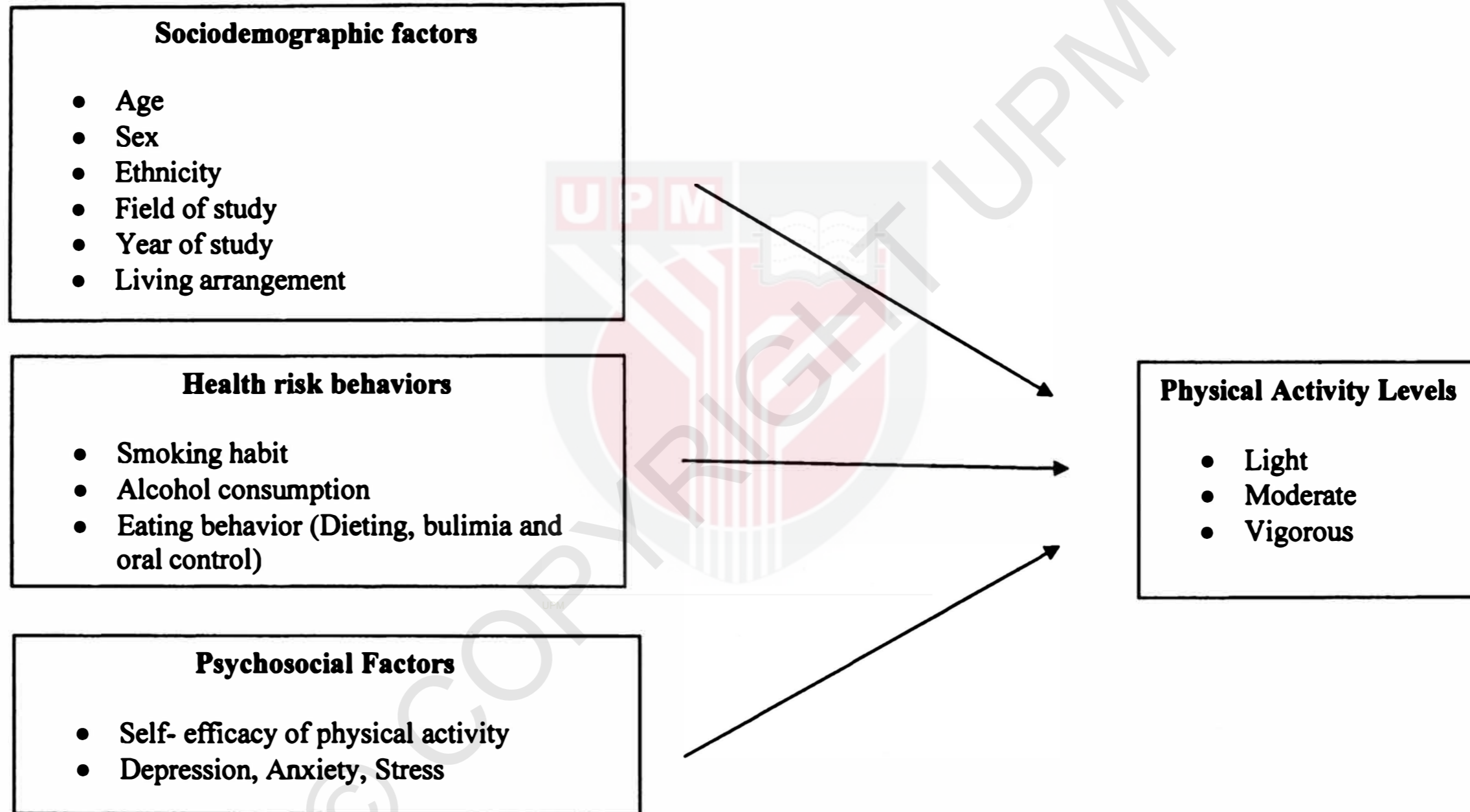


Figure 1.7: Research Frame Work

The research framework shows several factors associated with level of physical activity among university students (Figure 1). University students are a special group of people that are facing a critical transitory period in which they are changing from adolescence to adulthood and can be one of the most stressful times in a person's life. There are several factors that may be related to the physical activity level of students. This study examines socio-demographics, health risk behaviors and psychosocial factors as independent variables and physical activity level on dependent variable. Socio-demographic factors include, age, date of birth, sex, ethnicity, field of study, year of study and living arrangement. Psychosocial factors were examined as self-efficacy, depression, anxiety and stress. Excess stress can cause health problems as well as negative effects on cognitive functioning and learning. Higher level of stress is always associated with poor academic performance especially among students (Eyre, Papps, & Baune, 2013). Level of physical activity is correlated with depression because physical activity has positive impacts on depressive symptomatology in a variety of clinical contexts. It is discovered to have strong effects on depressive phenotype found in those who are having depression.

Health risk behavior factors that were examined include in several aspects such as smoking habit, alcohol consumption, eating behavior and disordered eating. College students are facing a transition from adolescent to young adulthood that need a nutritious diet, but they seem to be the most common group that practicing poor eating habit (Hilger, Loerbroks, & Diehl, 2016).

CHAPTER 2

LITERATURE REVIEW

2.1 Global trend and pattern of physical activity

Sedentary lifestyle always being one of the factors that contribute to the nutritional state among university student due to urbanization and industrialization. Youth may choose to be sedentary rather than being physically active (Peterson et al., 2018). According to the Third National Health and Morbidity Survey (NHMS) in 2011, the prevalence of normal weight (with body mass index 18.5 to 24.9) for people aged 18 years and above has decreased from 53.5% in MHNS II to 48.4%. However, the prevalence of overweight has shown a significant increase from 16.6% to 29.1% while for the obese adults, the prevalence also increased from 4.4% to 14.0%. This prevalence could reflect the importance of health issues related to weight in Malaysia which could also include students in the range age of 18 to 25 years old (NHMS, 2011; Tobergte & Curtis, 2013).

Physical activity on a regular basis is associated with many physical, psychological and physiological benefits and plays an important role in preventing a variety of illnesses (Guthold, Stevens, Riley, & Bull, 2018). Leading a sedentary lifestyle is closely connected with increasing body weight and can become a serious health problem in both childhood and in adolescence (Zalilah et al., 2006) and particularly among university students (Chan et al., 2018). Majority of people in society are aware of the benefits of regular physical activity in conjunction with healthy lifestyle, but also that physical inactivity and low fitness levels are one of the main problems of worldwide health (Chan et al., 2018).

However, there is still high prevalence of sedentary habits both in childhood and adolescence. For example 4.7% of Spanish youngsters with age between 15 and 24 years old and 62% aged between 15 and 74 years old confirmed of not practicing any sports.(Hallal et al., 2014). Some Mediterranean countries, such as Spain and Italy, are among the lowest level of regular exercise not only on an intensive level but also on a recreational one. Other countries like Scandinavian countries such as Sweden, Denmark and Finland show a higher practice of regular sport (Castillo, Duda, Balaguer, & Tomás, 2013).

In general, the trend with passive leisure, and urbanization has contributed to reduced physical activity level. The Health Education Board for Scotland showed that 62% of 16 to 24 years old in that country were not achieving the minimum requirements of physical activity for health (Caestine et al., 2017). Other study has

revealed that a high proportion of young adults sedentary or irregular active (Calestine et al., 2017). There is a need for research to establish effective ways of helping this population to become active.

According to the World Health Organization (2018) prevalence of insufficient physical activity was highest in WHO region of the Americas and Eastern Mediterranean region. In both these regions, 50% of women were insufficiently active, while the prevalence for men was 40% in the Americas and 36% in Eastern Mediterranean. The south East Asian region showed the lowest percentage (15% for men and 19% for women) and in all WHO region, men were more active than women, with the biggest difference in prevalence between the two sexes in eastern Mediterranean (WHO 2018).

Physical activity has been reported in many studies to have numerous benefits when performed in sufficient amount. Adequate level in physical activity in adults may also ensure the maintenance of body weight, reduce high blood pressure, lower arthritis's pain and associated disabilities, reduce the risk for osteoporosis and falls and reduce the symptoms of depression and anxiety this shows that physical activity can influence in many aspects in health condition of an individual (Warburton et al., 2011).

The needs of increasing physical activity was seen to be interrelated with body weight such as management of overweight and obesity. A study reviewed by the Dogra (2018) stated that the increment of obesity prevalence may reflect that the majority of the population has fallen below such level of physical activity (Dogra et al., 2018).

2.2 Physical Activity in Malaysia

The prevalence of obesity has reached epidemic levels in many developing countries, and Malaysia is of no exception. Based on the previous National Health and Morbidity Surveys (NHMS) carried out in 2006, 2011 and 2015, an increasing trend of overweight and obesity prevalence was observed among Malaysian adults aged 18 years and older: 29.1% and 14.5% in 2006, 29.4% and 15.1% in 2011, 30.0% and 17.7% in 2015, respectively. Overweight and obesity have been linked to various factors, including physical inactivity, unhealthy dietary habits, alcohol intake, socioeconomic conditions and genetic factors. Changes in individual lifestyle behaviors, such as a lack of physical activity and increased sedentary behavior associated with rapid urbanization, may lead to an increasing prevalence of overweight and obesity. From the Survey NHMS III, the physical inactivity increases by age. The prevalence of physical Inactivity by age group 20 to 24 was 41.4%. The highest prevalence of physical inactivity was reported among the adults with 57.4%. Moreover, adults with tertiary level (44.9%) and primary education level (42.9%). However only 41.1% of those adults had adequate exercise.

The NHMS III study also indicated that, 5.5 million of Malaysian adults were not physically active. In other word, 44 out of 100 adults are physically inactive. This distribution was lower compared to other countries. (NHMS III, 2015).

In Malaysia, physical inactivity was higher in women, older adults and in higher socio-economic groups (Chan et al., 2015). By ethnicity, the highest prevalence of physical inactivity was observed among Chinese followed by Indians, Bumiputra and Malays. Malaysian Adults Nutrition Survey (MANS) 2015 also reported that the adult population of Malaysia were generally sedentary. Only 14.4% had adequate exercise, corresponding to 19.5% among men and 9.1% among women. In National Health and Morbidity Survey III in 2015 reveled that woman are more inactive (50.5%) than men (35%). A difference between urban and rural population were also observed whereby urban adults were found to be more inactive (45.6%) as compared to rural adults (40.1%) (NHMS III, 2015).

2.3 Physical activity trend among young adults

Although most of young people look healthy, college students are not necessarily more active than general population. About four in ten undergraduates do not participate in moderate or vigorous activity on regular basis (Cavill, Kahlmeier, & Racioppi, 2015). In a survey of 2837 American students at a public in the Midwest, 53% of women and 40.3% of men had not engaged in vigorous physical activity in a month (Haryadi, Budiarti, Rahajuni, Lestari, & Setyanto, 2016). Physical activity level falls off dramatically during adolescents and young adulthood.

According to Park and Kim, (2013) the transition to university life and maintaining healthy lifestyle is a challenge during study and following decrease in the practice of moderate to vigorous physical activity. This becomes a critical moment for the promotion of physical activity especially among women who start to reduce their level of physical sport practice from 11 to 12 years old (Karthikeyan, Selvaganapathy, & Liew, 2016). Benerjee & Khatri (2010) reported that majority the medical students in India were not involved in adequate physical activity and only 39.4% of them participated in some vigorous physical activity.

In Malaysia, the data from National Health Morbidity survey III in 2015, reported that nearly 43.7% of adults aged 18 years old and above did not engage in any physical activity or exercise. Quah & Zaitun (2014) reported that more than half of the respondents from a sample of local university students spends 20-50 hours per week

sitting and doing light work such as studying, typing, listening to music, writing and desk work despite the credit hour for student were limited not more than 19hour per week (Quah & Zaitun, 2014). Heng & Zaitun (2013) reported that majority of students in University Putra Malaysia (UPM) were physically inactive rather than being active due to low self-efficacy toward physical activity.

2.4 Sociodemographic factors and factors associated with physical activity

Socio-demographic factor largely associated with physical activity with many evidences from past studies. There was a study conducted in Georgia to examine the frequency of use by socio-demographic group for various physical activity locations. According to this study, males were more active at the workplace setting while females were more active in neighborhood setting such as sidewalks and local parks (Asiamah, 2017; Babazekri, Juni, Mohd Zulkefli, Azman, & Movahedi, 2014).

A study from Moniruzzaman (2017) reported that physical activity associated with sociodemographic factors such as age, sex, occupation, education, and socio-economic status. Overall urban dwellers were positively associated 95% with insufficient physical activity compared to those residing in rural areas. Generally, women and housewives, in particular, were 2.1 and 3.8 times more likely than men, and other occupations respectively to have an insufficient physical activity. Although having

insufficient physical activity increased across the age groups, the oldest age group reported greatest insufficient physical activity compared to the youngest age group, especially in urban areas. Compared with those having no formal education, insufficient PA was 8.6 times higher in individuals who completed graduation or more. Overall, individuals self-allocated to the higher socio-economic class category were 2.4 times more likely than those self-allocated to the poor category to report insufficient PA as (Moniruzzaman, Ahmed, & Zaman, 2017).

The analysis of association between economic status and physical activity in Finland revealed some significant between-group differences; namely, the percentage of insufficiently active subjects observed in the highest economic category (monthly income above €640) was significantly lower (24.7%) than observed in other categories (about 37%). Moreover, subjects with the highest economic status were more frequently sufficiently active (38.5%) compared with those in the lowest economic category (31.4%), and more frequently achieved higher activity levels than subjects who declared a monthly income of €500 – €640 (10.6 and 4.6%, respectively).

This study also reported there is association between level of education with physical activity. People who have higher educational level they are more physically active compare to people with low education of level (Biernat & Tomaszewski, 2015). Higher education entailed not only more knowledge on how to take care of one's own health, but also the position in the occupational structure, which often requires creative approaches towards problems arising in the workplace (Buchholtz, 2016).

2.5 Self- efficacy

Self-efficacy can be defined broadly as individuals' confidence in their capability to achieve particular goals. Bebeley, Liu, & Wu, (2017) refers to self-efficacy as individuals' assessment and conviction regarding their ability to coordinate and perform a task successfully (Bebeley et al., 2017). Barannagan (2010) highlights that the judgement and convictions that individuals hold towards their capability to perform tasks constitute self-efficacy. Self-efficacy at university is vital for not only academic purposes and social adjustment, but also plays an integral role in the wellness and personal adjustment of students (Brannagan, 2010).

Self-efficacy (SE) is formed around how an individual perceives their self-worth (Wagner, Gerstorf, Hoppmann, Luszcz, 2013). SE can be defined as how an individual feel about themselves, it can be made up of feelings about our appearance, intelligence, and knowledge and it can influence behavior. In simple terms SE can be described as

negative or positive evaluations about ourselves. Research by Steiger, Allemand, Robins & Fend (2014) has found gender differences in SE with males reporting higher self-efficacy than females. In later life cognitive functioning and perceived control are have been shown to be correlates of SE (Wagner, Gerstorf, Hoppmann, Luszcz, 2013). Self-efficacy has also been shown to have a negative relationship with depression (Sharma & Agarwala, 2013). In addition, research has shown that low SE has been seen to be related to depression, fearfulness, shyness and loneliness. Furthermore Steiger, Allemand, Robins & Fend (2014) has been shown that low and declining levels of SE can predict depressive symptoms in later life. Interestingly a curvilinear analysis of self-efficacy has shown that both low and high SE have also been related to self-reported aggression (Steiger, Allemand, Robins & Fend, 2014).

In a study completed by Tamura (2014), males with high self-efficacy, performed better and had less anxiety in comparison with females when it came to information and communication technology (Tamura, 2014). There were also few studies from Gilbertson (2012) and Maria (2016), conducted to examine the role of self-efficacy in physical activity. One of the studies was conducted in Korea, which involved university students and it was found that self-efficacy indirectly related and contribute to increase in level of physical activity among the students (Gilbertson, 2012). Another study was conducted to examine relationship between mental well-being and physical activity among undergraduate university students. The findings of this study revealed that self-efficacy was significantly positively correlated with physical activity which involve moderate and vigorous intensity activity (Maria, Martins, Cecília, & Tenório, 2016) .

According to Armstrong & Omen-Early (2015), collegiate athletes have significantly higher self-efficacy (SE) than non-athletes. This finding was replicated in a Spanish university where it was found that students who had higher amounts of physical activity (PA) had significantly higher SE scores (Garcia, Castillo & Quearalt, 2013). According to a study involving Canadian college students investigating the relationship between physical activity self-efficacy and academic achievement has revealed a positive relationship between SE and physical activity. However, in a study examining the relationships among self-efficacy, stress and physical activity levels no significant association was found between SE and physical activity (Hubbs, Doyle, Bowden & Doyle, 2015).

2.6 Alcohol intake

Researchers have shown that alcohol is the intoxicating substance most widely used by youth. In 2011, 70.8 percent of youth aged 15–24 years reported alcohol consumption in the past 12 months (Health Canada, 2011). Despite a recent decline in reported prevalence of alcohol consumption among youth (from 78.4 percent in 2008 to 70.8 percent in 2011), 18 percent of youth reported drinking hazardously, exceeding Canada's low-risk alcohol drinking guidelines as released by Canadian Centre on Substance Abuse: 0 to 2 standard drinks a day, less than 10 per week for women; and 0 to 3 standard drinks a day, less than 15 per week for men (Mahmoud, Ali, & El-Sayed Ali, 2013). By contrast, the percentage of hazardous drinking for adult drinkers 25 years and older is 12.2 percent (Health Canada, 2013).

The amount and frequency of alcohol consumption increases at a steady pace in people between the ages of 18 and 22, and alcohol-related problems are inclined to peak in people's early 20s (Kong & Bergman, 2010).

Drinking among university students has garnered increased attention in the past two decades and has become an important public health concern. Currently, binge drinking is a major problem at North American universities. Although data show a slight decrease of heavy drinking among young adults (Ham & Hope, 2014), the problem still warrants serious attention.

After drawing a random sample of 105,781 students from post-secondary institutions in Canada, the American College Health Association National College Health Assessment II (ACHA-NCHA II) reported that in 2013 alcohol had been used by 65.9 percent of students during the past 30 days, with 65.7 percent of males and 66 percent of females respectively. Thirty one percent of the drinkers (with 41.5 percent of males and 29.5 percent of females) reported heavy drinking pattern (the usual consumption of more than five standard drinks per occasion) in the past two weeks (American College Health Association, 2011). Given the widespread use of alcohol and the potentially severe consequences of problematic drinking.

It is important to identify the factors relating to problematic drinking. Such factors may include gender, ethnicity, religion, and education. Demographic factors, particularly gender and ethnicity, have been found to be positively associated with problematic drinking. Some activities students engage in have been cited as variables associated with moderate to greater problematic drinking in university students (Ham & Hope, 2015).

Problematic drinking behaviors are distributed variously by culture and gender. Most research indicates that men constitute the overwhelming majority of binge drinkers. In recent years, however, gender differences may be waning, as women comprise an increasing proportion of those who use alcohol (Read & Brown, 2015). Drinking patterns, motives, and consequences are also distributed differently by gender.

Physical exercise is an effective mean of maintaining or enhancing overall health and wellness. It has been suggested that exercise has a dual beneficial role in the treatment of substance abuse. Firstly, it has the potential to attenuate the negative effects of ethanol consumption by mechanistic changes in the cell level. For example, exercise may attenuate the ethanol-induced decline in hepatic mitochondria, extend oxidative damage in the body and may even ameliorate decreased capillarization in skeletal muscle (Schrieks, 2015). In regard to mental health, exercise has numerous beneficial effects on mood, anxiety, depression, self-perception and self-efficacy. Additionally, exercise has been used as an adjunctive strategy for substance dependence during and following a treatment program. As was mentioned previously, exercise could be an effective

treatment for alcoholism; however, more research is required to elucidate the possible psychological and physiological mechanisms involved in the reduction of harmful alcohol consumption. (Schrieks, 2015)

Usher (2013), reported that acute effects of exercise and physical activity on alcohol urge and mood disturbance were examined in a counterbalanced cross-over design study. Twenty alcohol-dependent individuals, who had already completed a 3-month detoxification program, participated in the study. The experimental group underwent 10 min of moderate intensity exercise (40–60% of the heart rate reserve), while the control group underwent 10 min of light intensity exercise (5–20% of the heart rate reserve) in a cycle ergometer. The results showed that participants in the experimental group had a significantly reduced alcohol urge (by 19.7%) compared to the ‘control’ group during exercise, but not following exercise. No difference in mood between the groups was observed throughout the study. It is not known, however, whether a higher intensity of exercise as well as longer duration would be able to induce further favorable effects on alcohol urges (Usher et al., 2013).

A more recent study by Jamurtas (2014) used an exercise protocol of longer duration (30 min) and low intensity (~60% of the maximum heart rate). The results indicated an 18.6% decrease in alcohol urge in alcoholic patients compared to the control group that underwent the same exercise protocol. Although this change was not

statistically significant, it was close to the difference noticed in the acute experiment. (Jamurtas et al., 2014).

A study conducted by Murphy (2013) assessed the effects of exercise and meditation on alcohol consumption in 48 college students who were heavy social drinkers. Participants were randomly assigned to three conditions: A no-treatment control group, an experimental group that participated in an 8-week exercise program and a third group that participated in meditation training. Volunteers self-monitored their daily training program and consumption of alcohol throughout the study. The results showed that participants in the two treatment groups significantly reduced alcohol consumption by 14 drinks/week compared to the no-treatment control group by the end of the intervention.

There were no drop outs during the exercise intervention, however, only 72% returned to the follow-up assessment at 6 weeks. It was also reported that participants in the experimental group increased their fitness level during intervention and also for 6 weeks following cessation of the intervention (Murphy et al., 2013). Studies shown that exercise is a useful adjunctive tool to combat alcohol use disorders (AUDs). It is perceived that physical activity can have a dual action upon alcoholism. Firstly, it may attenuate the negative effects of alcoholism on health while it may also act centrally on the neurotransmitter systems involved in the mechanisms of addiction. (Schrieks, 2015).

2.7 Smoking Habit

Tobacco use is one of the most important health concerns in today's world. Cigarette smoking is recognized as public health problem. Malaysians national smoking prevalence was 24.8% (Anuar & Abdullah, 2010). The prevalence of ever and current smoking among students in University Putra Malaysia was 12.1% and 8.9%. The study among university students at Sweden, majority of respondents (90%) had consumed alcohol during preceding 3 month. The respondents who reported alcohol consumption were 55% female and 45% men (Maria et al., 2014).

A study reported there were an estimate of 69.6 million Americans who used tobacco products in 2010 (Results from the 2010 National Survey 2011). According to an estimate made by the Centers for Disease Control and Prevention using data from the 2000-2004 National Health Interview Survey responses and death certificates, cigarette smoking was the leading cause of death in the United States. It is estimated that approximately 19.3% of Americans over age 12 were current smokers as of the year 2010, with current cigarette smokers defined as "adults aged 18 years who reported having smoked 100 cigarettes during their lifetime and who now smoke every day or some days." (Vital Signs: Current Cigarette Smoking Among Adults Aged 18 Years 2011).

The consequences each year included \$96 billion in health costs and 5.1 million life years lost (Smoking-Attributable Mortality 2013). Smoking increases the risk of many cardiovascular, respiratory, and neoplastic diseases as well as other adverse health effects such as infertility and osteoporosis (U.S. Department of Health and Human Services 2004).

Cigarette smoking among young women was traditionally unacceptable by most Malaysian culture. For a long time, this had served as a protective factor against smoking among young women. However, rapid development and social changes that came along with modernization had eroded these protective barriers. It is currently more common to see young urban women smoking in public places. The ill effects of cigarette smoking are well known and are supported by a huge body of evidences from various studies (Phillips et al., 2015). As for women smokers, apart from the common risk of various malignancies and cardiovascular and respiratory diseases, they also face an increased risk of developing illnesses related to their reproductive health such as infertility, premature menopause, and cervical cancer (WHO, 2011). The risk of miscarriage, antepartum hemorrhage, and low-birth weight infant is also higher among women who smoke during their pregnancy (Kramer, 2012).

Taylor (2015) compared a bout of exercise with a passive condition and reported a positive effect on cigarette cravings, withdrawal symptoms and smoking behavior. The two remaining studies compared two intensities of exercise and showed no differences

in outcomes between them. In all these studies cigarette cravings, withdrawal symptoms and negative affect decreased rapidly during exercise and remained reduced for up to 50 minutes after exercise. Cravings and withdrawal symptoms were reduced with an exercise intensity from as high as 60% - 85% heart rate reserve (HRR) (lasting 30 - 40 minutes) to as low as 24% HRR (lasting 15 minutes), and also with isometric exercise (for 5 minutes). It was concluded that even relatively small doses of exercise should be recommended as an aid to managing cigarette cravings and withdrawal symptoms.

All the above reviews provide strong evidence that exercise sessions have an acute effect on cigarette cravings. All of the reviewed studies come from the behavioral discipline. There are other studies that come from the physiology discipline which might contribute to the understanding of the physiological mechanisms underlying these effects. A study from Teyhen (2016) review grouped the most recent research findings in three hypothetical explanation scenarios: the affect, biological and cognitive hypotheses. According to the affect hypothesis, several studies support the claim that an increase in positive affect could result in a decreased desire to smoke. However, results from different studies are not consistent about which intensity is most likely to create a positive effect. (Teyhen et al., 2016). According to Heydari & Hosseini (2015) both moderate and vigorous intensities had similar effects on cravings, but there was an adverse effect on mood. There is strong evidence that exercise reduces cigarette cravings, although there might be some differences in the magnitude of this effect for light, moderate, or vigorous exercise.(Heydari & Hosseini, 2015).

Gagn et al. (2017) examined the prevalence of physically active smokers in Canada via surveys from the Canadian Community Health Survey (CCHS). The study found 5441 physically active smokers and 17218 physically inactive smokers, translating to 22.6% of smokers being physically active (Gagn et al., 2017). Observing exercise patterns amongst adult male smokers (N=671), approximately 54% of smokers exercised less than once a week. A further 16.7% actually engaged in exercise at least twice a week (Saito et al., 2013).

People who smoke are less physically active. Even amongst those who are physically active, chronic smokers have significantly reduced cardiovascular fitness. Smoking reduces the capacity of the circulatory system, which diminishes exercise duration, increases blood pressure, and elevates heart rate. In a treadmill fitness test measuring oxygen uptake and heart rate, researchers found that smoking significantly reduced the fitness capability in healthy males regardless of age (Tan & Zhang, 2018). In a systematic review 61% of studies performed on adult populations indicated a negative association between smoking and physical activity. Some potential reasons for this relationship include: smokers engage in risky behavior versus physical activity, less capable of being physically active due to decrease lung performance, higher rates of depression, suppressed desire to engage in physical activity (Kaczynski et al. 2012).

2.8 Eating Behavior

It has been shown that an individual's attitudes or perceptions greatly affect their behavior. First year college students are placed into a new environment which can lead to a development of, or continuation of, negative thoughts in regard to body image and dietary patterns. Both the risk for and prevalence of disordered eating is strongly correlated with concern about body weight, body image and extreme weight control behaviors (Strong & Malina, 2012). Analysis of dieting attitudes shows that 12% of students reported to having disturbed eating attitudes and 20% flagged for anorexic symptomatology. Many research studies have shown a difference in the prevalence of disordered eating patterns and negative body image amongst different ethnicities. Caucasian and African-American women hold very different definitions of beauty and body perception. Disordered eating has been found to be most common among young, Caucasian women. Caucasian young adults often appear to be more concerned about body weight and have more negative body cognitions than any other ethnic group (Flega et al., 2009).

Peer groups can have a great deal of influence on college students' eating attitudes and behaviors. Within the college community there are subgroups of students sometimes at greater risk of developing or continuing eating-related problems, such as those in sororities or in collegiate athletics. Those in sororities report greater use of diet pills, elimination of high fat foods and weight concerns interfering with social relationships

(Felorence et al., 2013). Women living in sorority houses have a greater fear of becoming fat, greater body dissatisfaction and weight preoccupation, as well as higher concern with dieting (Felorence et al., 2013). Both male and female college athletes feel an immense pressure to perform at high levels. In certain sports, a specific weight class or body shape is linked to this high performance. This leads college athletes to become more obsessed with weight and weight control. Among men, the frequency of eating disorder risks tended to be the highest in those who participated in inter-collegiate athletics and the relation of suicidal thoughts to risk for eating disorder was highest for the female athletes (Strong & Malina, 2012). The media has been seen to target and greatly influence the college age group. The media portrays an ideal thinness which plays into students' desire to want to fit in and be accepted. This pressure plays a decisive role in triggering negative self-evaluation, weight control, unhealthy eating behavior, and the development of eating disorders among college females. A common message in the media is "fat is bad." This fear of eating certain types of foods can be a precursor for a disordered eating pattern and may lead to a decrease in highly needed nutrients (Goodpaster & Katsiaras, 2013).

Healthy eating and physical activity patterns are important components in the lives of students and have shown to be positively correlated with academic success (Florence et al., 2013). For example, students engaged in healthful eating practices are less likely to be absent from school and more likely to score higher on cognitive functioning tests (Rampersaud & Pereira, 2015).

Research also suggests that students who are physically active have higher brain function, higher levels of attentiveness and self-esteem, and behave more appropriately in a classroom setting (Tremblay et al., 2010). It is a priority that students of all ages adhere to their age appropriate nutrition and physical activity-based recommendations to enhance their learning potential and overall health. However, it is particularly important for college aged students to develop and sustain sound eating and exercise habits early in their college careers as lifestyle habits established during this time period are likely to carry forward into the adult years and have a critical impact on future outcomes of health and disease susceptibility (Silliman et al., 2011).

CHAPTER 3

METHODOLOGY

3.1 Study design

This is a cross-sectional study that aimed to determine the association between sociodemographic, psychosocial and health risk behaviors with physical activity levels among undergraduate students in Faculty of Medicine and Health Sciences of University Putra Malaysia.

3.2 Study location

This study was conducted at the Faculty of Medicine and Health Sciences (FMHS), University Putra Malaysia (UPM) Serdang, Selangor. UPM is one of the research universities in Malaysia and it has 2 campuses. The main campus is located in Serdang, Selangor and another campus located in Bintulu, Sarawak. The Serdang campus is located approximately 25 km south of the capital city of Kuala Lumpur and has a total size 1108.103 hectare with 16 faculties and 9 institutes. FMHS is one of the faculties in UPM which is located adjacent to Hospital Serdang. There are 6 programs being offered for undergraduate students in this faculty which are Doctor of Medicine, Bachelor of Science (Biomedical Sciences), Bachelor of Science (Dietetic), Bachelor of Science (Nutrition and Community Health), Bachelor of Science (Environmental and Occupational Health) and Bachelor of Nursing.

3.3 Sample size

The sample size is calculated using the formula by Hulley, Cummings, Browner, Grady, & Newman, (2013).

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

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

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

Table 3.3: Sample size calculation

Variable	Correlation, r	Sample Size, n
Eating behavior and physical activity (Cachelin et al., 2016)	0.49	$C = 0.5 * \ln[(1+0.49)/(1-0.49)]$ $= 0.536$ $N = [(1.96+0.84)/0.536]^2 + 3$ $= 30.29 \sim 30$
Age and physical activity (Bello et al., 2016)	0.614	$C = 0.5 * \ln[(1+0.614)/(1-0.614)]$ $= 0.715$ $N = [(1.96+0.84)/0.715]^2 + 3$ $= 18.33 \sim 18$
Depression and physical activity (Azami, Mohamadian, & Direkvand-moghadam, 2017)	- 0. 256	$C = 0.5 * \ln [(1+-0.256)/(1--0.256)]$ $= -0.262$ $N = [(1.96+0.84)/(-0.262)]^2 + 3$ $= 117.212$ ≈ 118

To address reporting and recording error, 20% is added to the calculated sample size.

Hence, the required sample size is 150.

3.4 Respondents criteria

The respondents were chosen based on the following inclusion and exclusion criteria shown in Table 3.4

Table 3.4: Selection criteria

Inclusion Criteria	Exclusion Criteria
<ul style="list-style-type: none">• Undergraduate UPM students• 18 -25 years old• Able to understand Malay or English• Physically healthy• Malaysian male or female	<ul style="list-style-type: none">• Postgraduate students in UPM• Non-Malaysian students• Handicap or with physical disabilities

3.5 Sampling design

The sampling method used in this study was convenient sampling. Lists of all students and programs were obtained from the Faculty of Medicine and Health Sciences. There were 6 programs offered for undergraduate students at the faculty. Based on simple random sampling, 2 programs were selected which was Nutrition and Community Health and Biomedical Science. In each program 18 students were randomly selected to participate in this study from first year to final year. The total number of students from first year to fourth year of these programs are 190 and 191. Eligible students identified based on the inclusion and exclusion criteria. All eligible respondents were invited to participate in this study.

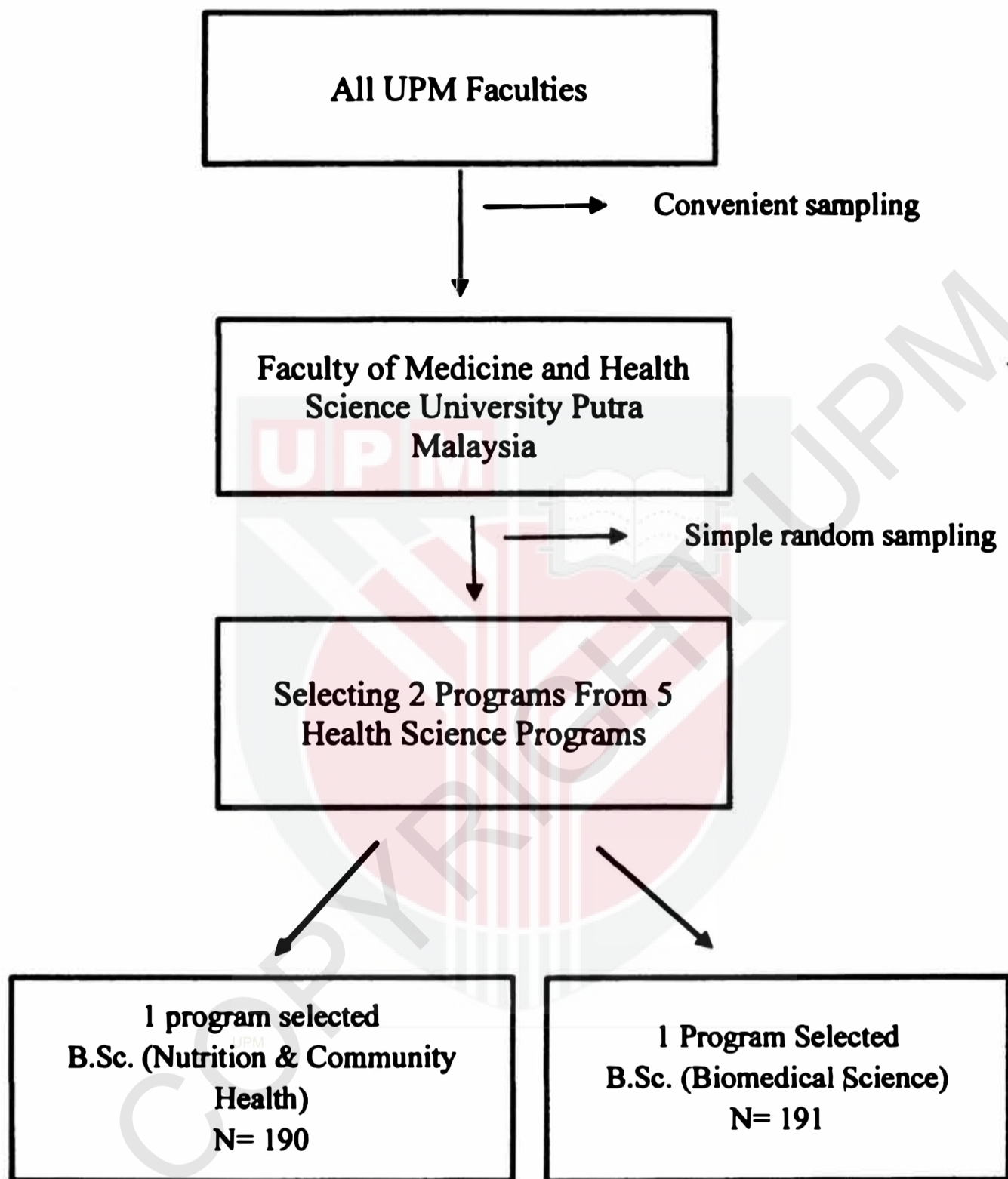


Figure 3.5: Sampling Method

3.6 Study measurements

In this study self-administered questionnaire was given to respondents which contains six different sections such as sociodemographic factors, physical activity, depression, self-efficacy, smoking habit, alcohol consumption and eating behavior.

3.6.1 Sociodemographic factors

The socio-demographic characteristics which include age, date of birth, sex, weight, height, ethnicity, field of study, and living arrangement of the subjects were obtained in a self-administered questionnaire.

3.6.2 Physical Activity

The International Physical Activity Questionnaire (IPAQ) was used to assess the health-related physical activity of the participants. IPAQ has been widely used in various studies internationally. This questionnaire includes 3 specific types of activities that can assess such as walking, moderate-intensity and vigorous intensity activities. Frequency (measured in days per week) and duration (hours and/or minutes per day) are incorporated in each of the questions. The indicators of physical activity of the undergraduate students through IPAQ can be measured by using categorical and continuous score. The categorical score can be expressed from the three levels of physical activities. The criteria for these three levels are shown in Table 3. The Cronbach's alpha coefficient for the entire scale was 0.65 to 0.82. IPAQ is a valid and reliable instrument for the assessment among younger adult (Medina et al., 2013; Oyeyemi et al., 2015).

Table 3.6.2: Physical activity categories and criteria

Category	Criteria
Category 1 (Inactive)	<ul style="list-style-type: none"> • The individuals who do not meet the criteria for Categories 2 or 3. • Considered as ‘insufficiently active’
Category 2 (Minimally Active)	<p>To be classified as ‘sufficiently active, one of the 3 criteria must be fulfilled.</p> <ul style="list-style-type: none"> ○ or more days of vigorous activity of at least 20 minutes/day OR ○ or more days of moderate-intensity activity or walking of at least 30 minutes/day OR ○ or more days of any combination of walking, moderate-intensity or vigorous intensity activities achieving a minimum of at least 600 MET-min/week.
Category 3 (Health Enhancing Physical Activity/HEPA)	<ul style="list-style-type: none"> • At least 3 days achieving a minimum total physical activity of at least 1500 MET-minutes/week or • 7 or more days of any combination of walking, moderate-intensity or vigorous-intensity activities achieving a minimum total physical activity of at least 3000 MET-minutes/week.

6.3 Depression, anxiety and stress

Depression, anxiety and stress were assessed students using scale-21 DASS based on self-reporting scale items, measuring characteristic attitudes and symptoms of depression, anxiety and stress (Lovibond, 1995). Each of the three emotional states from DASS-21 scales contains 7 items. The items in the depression scale assesses unhappiness, hopelessness and poor outlook for the future. The anxiety scale items assess fear response and psychological arousal, while the stress items focus on agitation and persistent arousal. The respondents will need to rate their emotional level on each statement over the past 1 week. Each item will be scored on a 4-point Likert scale (0 = did not apply to me at all, 1 = applied to me to some degree, or some of the time, 2 = applied to me to a considerable degree, or a good part of time, and 3 = applied to me very much, or most of the time). Table 4 shows the depression scale, scores of 9 or less were considered 'normal', 10–13 were 'mild', 14–20 were 'moderate', 21–27 were 'severe' and scores greater than 28 were considered 'extremely severe'. Scores less than 7 on the anxiety scale were considered 'normal', 8–9 were 'mild', 10–14 were 'moderate', 15–19 were 'severe' and those above 20 were considered 'extremely severe'. For the stress scale, scores less than 14 were considered 'normal', 15–18 were 'mild', 19–25 were 'moderate', 26–33 were 'severe' and scores greater than 34 were considered 'extremely severe'.

The Cronbach's alpha for DASS-21 among University Students was 0.761 to 0.906. DASS-21 is Reliable and suitable for use to assess symptoms of Common mental health problems, depression, anxiety, stress (Thi et al., 2017; Tran et al., 2013).

Table 3.6.3: Depression, anxiety and stress score

Category	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+

3.6.4 Smoking Habit

This section consists of a total of eight questions which were adopted and modified from The WHO STEPSWISE questionnaire (WHO, 2008). Respondent is required to respond whether he or she currently smokes cigarette or pipe, initial age of smoking, amount of cigarette smoked daily, the duration of smoking and whether the respondent ever tried to stop smoking. The Cronbach's alpha for STEPSWISE questionnaire was 0.70 and 0.88 and the questionnaire is reliable for smoking scale (Hwang et al., 2013; Ögel et al., 2017).

3.6.5 Alcohol intake

This section consists of total of five questions which were adopted and modified from WHO STEPSWISE questionnaire (WHO, 2008). The respondent is required to respond whether he or she ever tried drinking any type of alcohol beverages and also there are some questions about amount of alcohol intake within the past 30 days, the duration and frequency of alcohol intake and whether the respondent ever tried to stop drinking alcohol. The Cronbach's alpha for stepwise questionnaire was 0.70 and 0.88. STEPSWISE questionnaire is reliable for alcohol use (Newcombe et al., 2016; Ögel et al., 2017).

3.6.6 Self- Efficacy for physical activity

Self-efficacy for physical activity questionnaire (SEE) will assess students in 9 items. The scale ranges are from 0 to 10, with zero represent not confident whereas 10 represent very confident. For the scoring, total score is calculated by summing the responses to each question. The total score ranges from 0-90 with a higher score indicates higher self-efficacy for exercise (Resnick & Jenkins, 2000). The Cronbach's alpha coefficient was 0.80. SEE questionnaire is a valid and reliable instrument for the assessment of self-efficacy in individuals 18 years old and above. (Yildirim et al., 2016).

3.6.7 Eating Behavior

The eating attitude test (EAT-26), which is adopted and modified from Garner and Garfinkel (1979), consists of 26 items. The instrument has been widely used as standardized measure of symptoms and concerned characteristics of eating disorders. The EAT-26 has been particularly useful a screening tool to assess “eating disorder risk” in high school college and other special risk sample such as athletes (Garner, Rosen and Barry, 1998). The Cronbach's alpha coefficient was 0.75 and 0.86. EAT-26 is valid and reliable instrument for the assessment among college students (Gleaves et al., 2016; Rivas et al., 2010).

This test covered three dimensions as shown in Table 3.6.7

- **DiETING**

The dieting (13 items) indicates pathological avoidance of fattening foods and preoccupation with a thin body.

- **Bulimia and food preoccupation**

The bulimia and food preoccupation (6 items) reflect bulimic tendencies such as being eating and purging.

- **Oral control**

The oral control (7 items) reflects prevised pressure to eat more and degree of self-control over eating.

Table 3.6.7: EAT-26 Subscale items

Subscales	Questions
Dieting scale items	1, 6, 10, 11, 12, 14, 16, 17, 22, 23, 24, 26
Bulimia scale items	3, 4, 9, 18, 21, 25
Oral control subscale items	2, 5, 8, 13, 15, 19, 20

There are six choices of answers for each item which were “always”, “usually”, “often”, “sometimes”, “rarely” and “never”. Responses for each item is weighting from zero to three. For all items except item 26, a score of 3 is given for “always”, a score of 2 for “usually”, a score of 1 for “often” and a score of 0 is assigned to “sometimes”, “rarely” and “never”. However, for item 26 reverse scoring is applied.



3.7 Pre-testing

For pre-test 10 undergraduate students from UPM who meet the study criteria were chosen to fill out the questionnaire. The pre-testing of questionnaire is required to identify the time needed to complete the questionnaire as well as to check if the instruction given is clear and understandable to the subjects. Any problems and errors that arise during the answering of questionnaire is determined based on their feedback. The 10 subjects who are involved in the pre-testing will not be included in the data collection.

3.8 Study approval

Before the data collection, Ethics approval obtained from the Ethic Committee for Research Involving Human Subject (JKEUPM) of University Putra Malaysia. An approval letter was obtained from the (Faculty of Medicine and Health Science) to use the facilities for data collection.

3.9 Data collection

Data collection was conducted from 20th of April to 30th of April 2019 at student plaza which is located in Faculty of Medicine and Health Science. Respondents who met the study criteria were given information sheet and consent forms that explained the protocol and objective of this study.

3.10 Statistical analysis

Data analyzed using IBM SPSS Statistics 22. Descriptive analysis used to compute data into means, variance, frequencies, standard deviation and percentage. Pearson's correlation coefficient test used to determine the relationship between two continuous variables and chi square used to determine the association between two categorical variables. The significance level for the test is set at $P < 0.05$.



CHAPTER4

RESULTS AND DISCUSSION

4.1 Socio-demographic characteristics of the respondents

A total of 150 students (10 males and 140 females) aged 18-25 years participated in this study (Table 4.1). Majority of the respondents were Malays (82%), followed by Chinese (6%), Indian (12%). Majority of respondents were female (93.3%) and male (6.7%). The mean age of respondents was 21.65 ± 0.453 years. In this study, most of respondents were college resident (90.7%) while 9.3% of them were living outside the campus. Half of the respondents were students in Bachelor Science (Nutrition and Community Health) (52%), followed by Bachelor Science (Biomedical Science) (48%).

Table 4.1: Socio demographic characteristics of the respondents

Category	Male (n =10) n (%)	Female (n =140) n (%)	Total (n=150)	Mean (SD)
Age (years)				21.65 ± 0.453
<19	1 (10.0)	2 (1.4)	3 (2.0)	
19-22	6 (60.0)	107 (76.4)	113(75.5)	
>23	3 (30.0)	31 (22.1)	34 (22.7)	
Ethnicity				
Malay	6 (60.0)	117 (83.6)	123 (82.0)	
Chinese	1 (10.0)	8 (5.7)	9 (6.0)	
Indian	3 (30.0)	15 (10.7)	18 (12.0)	
Study Program				
Biomedical Science	2 (20.0)	70 (50.0)	72 (48.0)	
Nutrition and Community Health	8 (80.0)	70 (50.0)	78 (52.0)	
Year of Study				
First year	2 (20.0)	39 (27.9)	41 (27.3)	
Second Year	2 (20.0)	36 (25.7)	38 (25.3)	
Third year	4 (40.0)	34 (24.3)	38 (25.3)	
Fourth year	2 (20.0)	31 (22.1)	33 (22.0)	
Accommodation				
College residence	9 (90.0)	127 (90.7)	136 (90.7)	
Outside campus	1 (10.0)	13 (9.3)	14 (9.3)	

4.2 Physical activity of respondents

Physical activity of respondents was measured by long version IPAQ. The IPAQ data were analyzed using the guideline for data processing of the IPAQ. Physical activity was expressed as metabolic equivalent- hour/week (MET-hour/week). According to the IPAQ scoring, there are three classification of physical activity level; low, moderate and high. Table 4.2 show that majority of students were doing moderate physical activity (37.3%), followed by high physical activity (36.7%) and low physical activity (26%)

Table 4.2: physical activity level of respondents

Physical Activity Level	Male (n = 10) n (%)	Female (n = 140) n (%)	Total respondents (n=150)
Low (<600 Mets)	1 (10.0)	38 (27.1)	39 (26.0)
Moderate (600-1500 Mets)	6 (60.0)	50 (35.7)	56 (37.3)
High (> 1500 Mets)	3 (30.0)	52 (37.1)	55 (36.7)

4.3 Smoking habit

Table 4.3 presents the distribution of respondents according to smoking habit, from the total respondents currently smoke any tobacco products was 5.3%. Smoking occurred more frequently in males (50%) than females (2.0%). The previous study also had shown smoking habit is much higher among the males than female students (Tee et al., 2013).

Among the smoker students, 2.7% smoked daily and this group had started smoking as earlier than 16 year (2.6%), followed by 16-19 years (2.6%). According to the total respondents who smoke, only 2.7% of the respondents remember how long ago they smoke tobacco products. From this result, only 3.3% stopped smoking daily when they were more than 19 years old. The duration of total respondents who stop smoking daily more than 6month was (5.3).

Table 4.3 Smoking habit of respondents

Category	Male n (%)	Female n (%)	Total respondents (n=150)
Do you currently smoke any tobacco products?			
Yes			
No	5 (50.0)	3 (2.1)	8 (5.3)
	5 (50.0)	137 (97.9)	142 (94.7)
Do you currently smoke tobacco products daily?			
Yes	3 (30.0)	1 (0.7)	4 (2.7)
No	7 (70.0)	139 (99.3)	146 (97.3)
How old were you when you first start smoking age (years) daily?			
<16 years	3 (30.0)	1 (0.7)	4 (2.6)
16-19	2 (1.4)	2 (1.4)	4 (2.6)
None	5 (50.0)	137 (97.9)	142 (93.4)
On average how many cigarettes do you smoke each day?			
1 – 2	5 (50.0)	3 (2.1)	8 (5.3)
>3	0	0	0
None	5 (50.5)	137 (97.9)	142 (93.4)
In the past, did you ever smoke daily?			
Yes	2 (20.0)	2 (1.4)	4 (2.6)
No	8 (80.0)	138 (98.6)	146 (97.3)
How old were you when stop smoking daily?			
<19 years	0	0	0
>19 years	2 (20.0)	3 (2.1)	5 (3.3)
None	8 (80.0)	137 (97.9)	145 (95.4)
How long ago did you stop smoking daily?			
>6 months	5 (50.0)	3 (2.1)	8 (5.3)
<6months	0	0	0
None	5 (50.0)	140 (97.9)	145 (5.4)

4.4 Alcohol consumption

Table 4.4 shows the distribution of respondents according to alcohol consumption among the respondents. The total of respondents consumed an alcohol drink was 9.2%, alcohol consumption in males were higher compare to females (30.0% vs 7.9%). The total respondents who consumed an alcohol drink within pas 12 months was 9.2%. Among the respondents, who consumed alcoholic drink within the past 30 days was 5.3% from the total respondents; 10.0% were male and only 3.6 were female. For 12 months, the drinker frequently consumed alcoholic beverages less than once a month was 7.9%, 1-3 days per month 1.3% and respondents who did not consume alcohol beverages with in pas 12 months was 89.5%. The total respondents consumed alcoholic drink during past 30 days was 5.3% (1-2 times), followed by people who did not consume alcohol during pas 30 days were 94.7%.

Table 4.4 Alcohol consumption of respondents

Category	Male n (%)	Female n (%)	Total respondents (n=150)
Have you ever consumed alcohol drink?			
Yes	3 (30.0)	11 (7.9)	14 (9.2)
No	7 (70.0)	129 (92.1)	136 (89.5)
Have you consumed alcohol drink within the past 12 months?			
Yes	3 (30.0)	11 (7.9)	14 (9.2)
No	7 (70.0)	129 (92.1)	136 (89.5)
During the past 12 months, how frequently have you had at least one alcoholic drink?			
Not at all	7 (70.0)	129 (92.1)	136 (89.5)
1-3 days per month	0	2 (1.4)	2 (1.3)
Less than once a month	3 (30.0)	9 (6.4)	12 (7.9)
Have you consumed an alcoholic drink within the past 30 days?			
Yes	1 (10.0)	5 (3.6)	6 (5.3)
No	9 (90.0)	135 (96.4)	144 (94.7)
During the past 30 days, on how many occasions did you have at least one alcoholic drink?			
1-2 times	1 (10.0)	5 (3.6)	6 (5.3)
Not at all	9 (90.0)	135 (96.4)	144 (94.7)

4.5 Eating behavior

Eating attitude test-26 (EAT-26; Garner & Garfinkel, 1979) was used as screening measure in the present study to identify those at risk for disorder eating. This test consists of three subscales namely (N=13), bulimia and food preoccupation (N=16) and oral control (N=7).

Table 4.5 shows eating behavior of respondents by gender. From the results there were 4.0% of respondents diagnosed having oral control issue, followed by bulimia (18.0%) which 17.1% of them were female and 30.0% of them were male and lastly, respondents who had dieting issue was about 4.0%. As we can see from the results majority of respondents had bulimia followed by oral control and dieting.

Table 4.5 Eating behavior of respondents

Eating Behavior	Male n (%)	Female n (%)	Total respondents (n=150)	Mean (SD)
Oral Control				1.04 ± 0.197
No	10 (100.0)	134 (95.7)	144 (96.0)	
Yes	0 (0.0)	6 (4.3)	6 (4.0)	
Bulimia				1.18 ± 0.385
No	7 (70.0)	116 (82.9)	123 (82.0)	
Yes	3 (30.0)	24 (17.1)	27 (18.0)	
Dieting				1.04 ± 0.197
No	10 (100.0)	134 (95.7)	144 (96.0)	
Yes	0 (0.0)	6 (4.3)	6 (4.0)	

4.6 Psychosocial factors

Table 4.6 shows psychosocial factors of respondents. As we can see from the results 12.0% of respondents had mild depression, followed by 2.0% moderate depression. Respondents who had mild stress were 1.3% while 0.7% of them had moderate stress. Anxiety level among respondents was the highest factor compare to depression and stress level, 11.3% of the respondents had mild anxiety, followed by moderate 17.3% and severe 0.7%. which 20% were male and 17.1% were female. Self-efficacy for physical activity were measure by 3 categories such as low, moderately and very confident. Table 4.7 show that 26.7% of respondents had low confidence level to do exercise while, 68.7% of them had moderate confidence level, followed by very confident (4.7%) among moderately confident 80% were male and 67.9% were female.

Table 4.6 Psychosocial factors of respondents

Psychosocial Factors	Male n (%)	Female n (%)	Total respondents (n=150)
Depression			
Normal	8 (80.0)	121 (86.4)	129 (86.0)
Mild	2 (20.0)	16 (11.4)	18 (12.0)
Moderate	0	3 (2.1)	3 (2.0)
Anxiety			
Normal	6 (60.0)	100 (71.4)	106 (70.7)
Mild	2 (20.0)	15 (10.7)	17 (11.3)
Moderate	2 (20.0)	24 (17.1)	26 (17.3)
Severe	0	1 (0.7)	1 (0.7)
Stress			
Normal	10 (100.0)	137 (97.9)	147 (98.0)
Mild	0	2 (1.4)	2 (1.3)
Moderate	0	1 (0.7)	1 (0.7)
Self-efficacy of physical activity			
Low confident	2 (20.0)	38 (27.1)	40 (26.7)
Moderately confident	8 (80.0)	95 (67.9)	103 (68.7)
Very confident	0	7 (5.0)	7 (4.7)

4.7 Relationship between Socio- demographic characteristics and physical activity level

Table 4.7 shows the association between physical activity level and socio demographic characteristics. Socio demographic characteristics (age, gender, ethnicity, study program and accommodation) were not significantly correlate with physical activity level ($p>0.05$) while there was a significant correlation between year of study and physical activity level ($p= 0.024$) ($\chi^2= 14.521$).

Previous study showed male were more active compared to female and the classification of physical activity level was classified according to inactive and active, but this study shows there is no significant relationship between gender and physical activity ($p>0.05$) (Muttappallymyalil, 2014).

In the analysis of physical activity level by ethnicity and religion, the result shows that there was no significant relationship between physical activity level and ethnicity ($p=0.465$). There was no significant relation ship between physical activity level and study program ($p=0.471$). The study from Quadros et al., (2013) shows, there were no significant relationship between study program and physical activity ($p>0.05$).

Table 4.7 shows there was no significant difference between physical activity and living arrangement ($p=0.808$). The previous study shown there was an association between living arrangement and physical activity due to availability and access to exercise facilities outside the campus. However, this study shows there is no difference between students who live inside and outside the campus in terms of physical activity level (Quadros et al., 2013).

As the results show, there is a significant relationship between physical activity level and year of study ($p=0.024$) ($\chi^2= 14.521$). The results show the higher the study level the lesser the physical activity level. Previous study also shows that there is a significant relationship between age and year of study with physical activity level. First year and second year have higher physical activity compare to third year and fourth year students (Vanessa, 2016).

Table 4.7: Association between socio- demographic characteristics and physical activity

Socio-demographic and socioeconomic characteristics	n (%)			χ^2	p-value
	Light	Moderate	Vigorous		
Age				4.458*	0.293
<19	1 (2.5)	1 (1.8)	2 (1.8)		
19 – 22	26 (65.0)	47 (82.5)	40 (72.7)		
>23	13 (32.5)	9 (15.8)	14 (25.5)		
Gender				2.310*	0.317
Male	1 (2.5)	6 (10.5)	3 (5.5)		
Female	39 (97.5)	51 (89.5)	52 (94.5)		
Ethnicity				3.665*	0.465
Malay	31 (77.5)	48 (84.2)	46 (83.6)		
Chinese	2 (5.0)	2 (3.5)	5 (9.1)		
Indian	7 (17.5)	7 (12.3)	4 (7.3)		
Study Program				1.505	0.471
Nutrition and community Health	16 (40.0)	30 (52.6)	26 (47.3)		
Biomedical Science	24 (60.0)	27 (47.4)	29 (52.7)		
Year of Study				14.521	0.024
First Year	11 (27.5)	23 (40.4)	7 (12.7)		
Second Year	7 (17.5)	14 (24.6)	17		
Third Year	9 (22.5)	(30.9)			
Fourth Year	13 (32.5)	12 (21.1)	17 (30.9)		
		8 (14.0)	14 (25.5)		
Accommodation				0.426	0.808
College residence	35 (87.5)	52 (91.2)	50 (90.9)		
Outside campus	5 (12.5)	5 (8.8)	5 (9.1)		

*Fisher exact

4.8 Relationship between health risk behavior and physical activity level

Table 4.8 shows the association between health risk behavior and physical activity level. Health risk behavior (smoking habit, alcohol intake and eating behavior) were not significant correlation with physical activity ($p>0.05$).

Result shows there was no significant relationship between alcohol intake and smoking habit with physical activity level ($p=0.277$) and ($p= 0.141$) respectively. Previous study shows there is significant correlation between smoking habit and alcohol consumption with physical activity among students. The study claimed that students who were smoking or consuming alcohol tend to have lower physical activity (Murphy et al., 2013).

The results show there was no significant relationship between eating behavior and physical activity level ($p>0.05$). However, previous study shows there is correlation between eating behavior and physical activity among students. The study shows that eating behavior has great impact on physical activity level (Felorence et al., 2013).

Table: 4.8 Association between health risk behavior and physical activity

Health risk behavior	n (%)			χ^2	<i>p</i> -value
	Light	Moderate	Vigorous		
Smoking Habit				2.650*	0.277
Smokers	2 (5.1)	5 (8.9)	1 (1.8)		
Non-Smokers	37 (94.9)	51 (91.1)	54 (98.2)		
Alcohol Consumption				3.923	0.141
Alcohol consumers	6 (15.4)	6 (10.7)	2 (3.6)		
Non-alcohol consumer	33 (84.6)	50 (89.3)	53 (96.4)		
Oral Control				1.955*	0.504
Normal	38 (97.4)	52 (92.9)	54 (98.2)		
Abnormal	1 (2.6)	4 (7.1)	1 (1.8)		
Bulimia				1.156	0.561
No	34 (87.2)	44 (78.6)	45 (81.8)		
Yes	5 (12.8)	12 (21.4)	10 (18.2)		
Dieting				2.027*	0.395
No	36 (92.3)	55 (98.2)	53 (96.4)		
Yes	3 (7.7)	1 (1.8)	2 (3.6)		

*Fisher exact

1.9 Relationship between psychosocial factors and activity level

Table 4.10 highlighted the relationship between psychosocial factors and physical activity level. Psychosocial factors (depression, anxiety and stress level) were not significant correlation with physical activity ($p>0.05$).

Result shown there was a significant relationship between self-efficacy for exercise and physical activity level ($p=0.009$). There were also few studies from Gilbertson (2012) and Maria (2016), conducted to examine the role of self-efficacy in physical activity. One of the studies was conducted in Korea, which involved university students and it was found that self-efficacy indirectly related and contribute to increase in level of physical activity among the students (Gilbertson, 2012). Another study was conducted to examine relationship between mental well-being and physical activity among undergraduate university students. The findings of this study revealed that self-efficacy was significantly positively correlated with physical activity which involve moderate and vigorous intensity activity (Maria, Martins, Cecília, & Tenório, 2016).

Based on the result respondents who had moderate physical activity had low confidence level toward exercise (30.4%), and respondents who had vigorous physical activity had moderate confident level (78.2%), while students who were very confident about doing exercise had moderate physical activity (8.6%). According to table 4.10 majority of respondents who had mild depression (16.1%) and mild anxiety (14.3%) level had moderate physical activity while respondents who had mild stress level (2.6%) had light physical activity.



Table 4.9: Associations between Psychosocial factors and physical activity

Psychosocial Factors	n (%)			χ^2	<i>p</i> -value
	Light	Moderate	Vigorous		
Self-Efficacy				12.299*	0.009
Low confidence	11 (28.2)	17 (30.4)	12 (21.8)		
Moderately confident	28 (71.8)	32 (57.1)	43 (78.2)		
Very confident	1 (2.4)	3 (8.6)	3 (4.1)		
Depression				2.026*	0.806
Normal	35 (89.7)	46 (82.1)	48 (87.3)		
Mild	3 (7.7)	9 (16.1)	6 (10.9)		
Moderate	1 (2.6)	1 (1.8)	1 (1.8)		
Anxiety				4.230*	0.676
Normal	29 (74.4)	38 (67.9)	39 (70.9)		
Mild	5 (12.8)	8 (14.3)	4 (7.3)		
Moderate	5 (12.8)	9 (16.1)	12 (21.8)		
Stress				3.219*	0.797
Normal	38 (97.4)	55 (98.2)	54 (98.2)		
Mild	1 (2.6)	1 (1.8)	0		

*Fisher exact

CHAPTER 5

CONCLUSION AND RECOMMENDATION

A cross sectional study was carried out to determine physical activity level among students at faculty of medicine and health science, University Putra Malaysia, Kuala Lumpur. The respondents ranged from 18-25 years and fulfill the inclusion criteria in this study.

The result of the study showed the total number of the respondents involved in this study was 93.3% female and 6.3% male. The respondents who involved in this study were Malay (82%), followed by Chinese (6%), Indian (12%). From this study, the results shown more than 90.7% of students were college residence while 9.3% of students were living outside.

Based on assessment most of the respondents were categorized in moderately active (37.3%), followed by vigorous activity (36.7%) and 18.2% were categorized as sedentary. From this study, 35.7% of female respondents were classified as moderate physical activity level and 60% were male. In vigorous activity, majority of female respondents were in the highest percentage compared to male (37.1% vs 30%).

In sedentary activity, the highest percentage are male (10%) and 27.1% was female.

The present study found that there was no significant relationship between socio demographic characteristics (Age, gender, ethnicity, field of study, and living arrangement) while there is significant association between year of study and physical activity. Moreover, this study shown There is no significant relationship between health risk behavior (smoking habit, alcohol consumption and eating behavior) with physical activity. This study also shown there is no significant relationship between psychosocial factors (depression, anxiety, stress) with physical activity. However, there is significant association between self-efficacy and physical activity level.

There were several limitations in this study that could affect the study findings. The cross-sectional study design was unable to suggest any causal relationship between dependent and independent variables. There was a tendency to overestimate activity due to self-reporting and honesty of the respondents during fill the questionnaire (Dan et al., 2013). The questionnaire was provided to respondents in English version, it may difficult for them to understand terminologies used in that session, such as IPAQ and Dass-21 questionnaire which need more explanation regarding these sections.

The recommendation for this study in future, if the researcher wants to determine physical activity level, should use some tools such as pedometer or accelerometer to assess objective method to increase the accuracy of results. From that, we can determine more details on types of physical activity done by the respondents. Secondly, researcher should make sure about the gender equality of respondents, so the researcher can interpret the data by gender when there is an equal number of male and female. During data collection, the respondents who have been selected in this study were busy due to submission of their assignments and examination just around the corner it was a main issue for researcher to conduct this study. Besides that, it was very difficult to gather the respondents due to the time limitation among respondents even though they have been informed earlier by management of faculty.

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APPENDIX



**JAWATANKUASA ETIKA UNIVERSITI UNTUK
PENYELIDIKAN MELIBATKAN MANUSIA (JKEUPM)
UNIVERSITI PUTRA MALAYSIA, 43400 UPM SERDANG,
SELANGOR, MALAYSIA**

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

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

.STUDY TITLE :

Factors associated with physical activity among undergraduate students in University Putra Malaysia

2. INTRODUCTION:

Regular and moderate physical activity is a crucial component of healthy life style thus, appropriate regular physical activity is beneficial to as it is very effective in preventing and reducing risk of common chronic diseases, improving musculoskeletal, managing body weight and reduce symptoms of depression. The purpose of this research is to investigate the relationship between socio-demographic characteristics, psychosocial factors and health risk behavior with physical activity levels among undergraduate students in University Putra Malaysia.

3. WHAT WILL YOU HAVE TO DO?

A set of self-administered questionnaires will be given to the subjects. This questionnaire consists of sections where respondents have to answer all the questions given. This questionnaire has 6 sections which is demographic status (section A), international physical activity questionnaire (Section B), self-efficacy for physical activity (section C), alcohol intake and smoking habit (section D), depression, anxiety and stress (section E) and eating behavior (section F).

4. WHO SHOULD NOT PARTICIPATE IN THE STUDY?

- Non-Malaysian students
- Postgraduate students
- Handicap or with physical disabilities
- Students who are not in the age range of 18 to 25 years old

WHAT WILL BE THE BENEFITS OF THE STUDY:

(a) TO YOU AS THE SUBJECT?

This study can help the subjects to determine their physical activity level, their psychological and eating behavior toward physical activity which is important to motivate them to be more committed in increasing their physical activity.

(b) TO THE INVESTIGATOR?

The investigator will gain the information regarding the relationship between health risk behaviors and psychological factors with physical activity level and practice of exercise among undergraduate students in University Putra Malaysia.

6. WHAT ARE THE POSSIBLE RISKS?

This research only poses a very low risk as it involves only filling out questionnaire forms.

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

Your personal information and identity given in this questionnaire is for research purpose only and will be kept strictly confidential and will not be exposed to any third parties.

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

If you have any problem about this research during data collection you can directly contact Ms. Parisa Sadat Modaresi through phone (0146107753), or email (Parisa.md6@gmail.com).

CONSENT

..... Identity Card No.
address.....

.....hereby voluntarily agree to take part in the research stated above *(clinical /drug trial/video recording/ focus group/interview-based/ questionnaire-based).

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

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
(Respondent)

Signature
(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)

Reference number: _____



UPM
UNIVERSITI PUTRA MALAYSIA

**Nutrition and Community Health
Department of Nutrition & Dietetics
Faculty of Medicine and Health Sciences
University Putra Malaysia**

Title:

Factors associated with physical activity among undergraduate university students in University Putra Malaysia

Researcher:

Parisa Sadat Modaresi

Supervised by:

Prof. Dr. Zalilah Mohd Shariff

Your personal information given in this questionnaire is for research purpose only and will be kept strictly confidential and will not be exposed to any third parties. Thus, your honesty and cooperation are needed for completing this questionnaire. Indeed, we would be grateful if you could oblige us by completing this attached questionnaire.

Thank You.

Part A: Socio-demographic characteristics

Please fill in the following personal information.

Age: _____ years

Date of Birth: _____

Gender:

Male

Female

Ethnicity:

Malay

Indian

Chinese

Others, please specify: _____

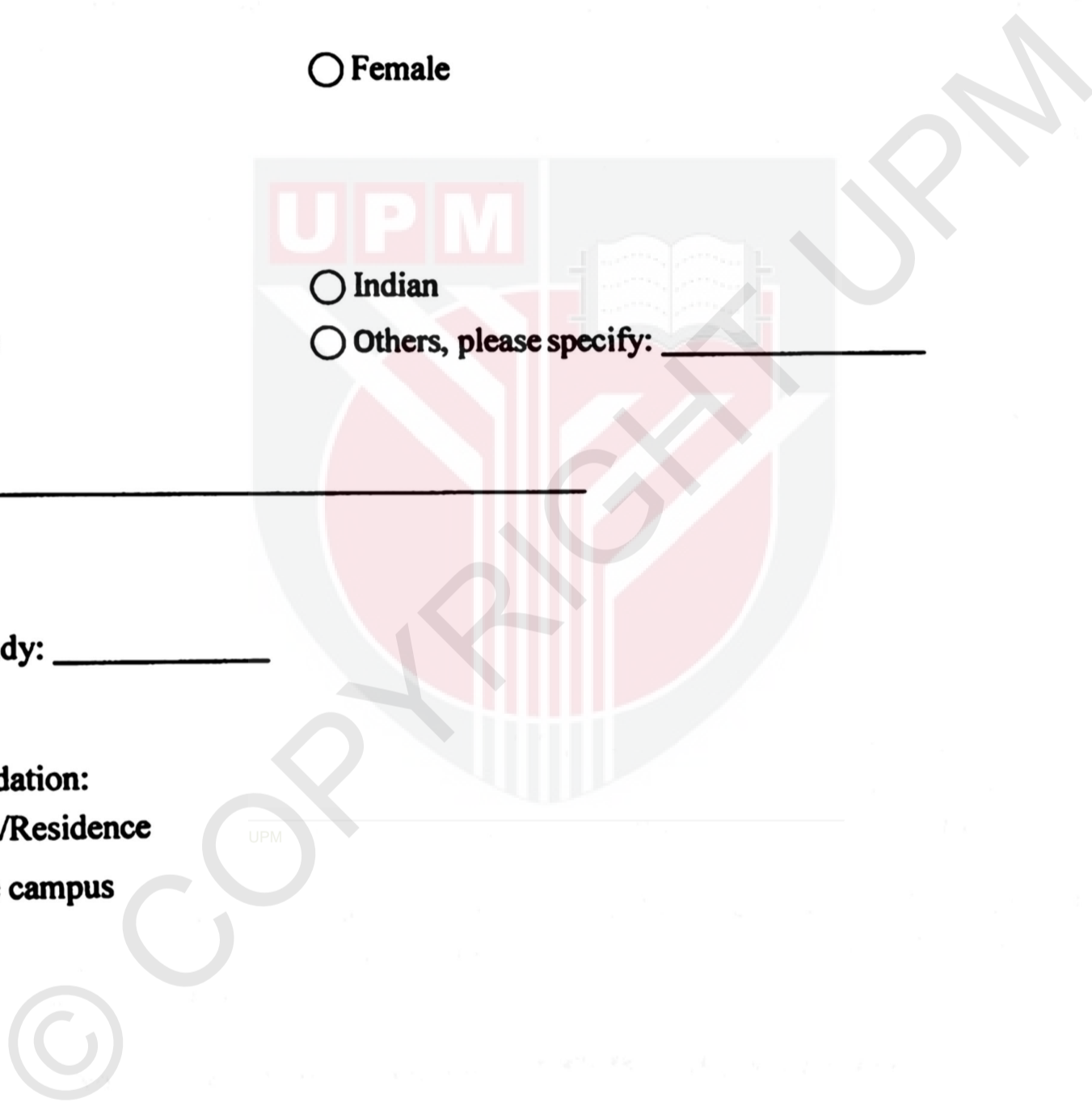
Course: _____

6. Year of study: _____

Accommodation:

College/Residence

Outside campus



Section B

We are interested in finding out about the kinds of physical activities that people do as part of their everyday lives. The questions will ask you about the time you spent being physically active in the **last 7 days**. Please answer each question even if you do not consider yourself to be an active person. Please think about the activities you do at work, as part of your house and yard work, to get from place to place, and in your spare time for recreation, exercise or sport.

Think about all the **vigorous** activities that you did in the last 7 days.

Vigorous physical activities refer to activities that take hard physical effort and make you breathe much harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

1. During the last 7 days, on how many days did you do vigorous physical activities like heavy lifting, digging, aerobics, or fast bicycling?

_____ days per week

No vigorous physical activities → *Skip to question 3*

2. How much time did you usually spend doing vigorous physical activities on one of those days?

_____ hours per day

_____ minutes per day

Do not recall/Not sure

Think about all the **moderate** activities that you did in the last 7 days. Moderate activities refer to activities that take moderate physical effort and make you breathe somewhat harder than normal. Think only about those physical activities that you did for at least 10 minutes at a time.

3. During the last 7 days, on how many days did you do moderate physical activities like carrying light loads, bicycling at a regular pace, or double tennis? Do not include walking.

_____ days per week

No moderate physical activities → *Skip to question 5*

4. How much time did you usually spend doing moderate physical activities on one of those days?

_____hours per day

_____minutes per day

Do not recall/Not sure

Think about the time you spent **walking** in the **last 7 days**. This includes at work and at home, waling to travel from place to place, and any other walking that you have done solely for recreational, sport, exercise or leisure.

5. During the **last 7 days**, on how many days did you **walk** for at least 10 minutes at a time?

_____days per week

No walking → *Skip to question 7*

6. How much time did you usually spend **walking** on one of those days?

_____hours per day

_____minutes per day

Do not recall/Not sure

The last question is about the time you spent **sitting** on weekdays during the **last 7 days**. Include time spent at work, at home, while doing course work and during leisure time. This may include spent sitting at a desk, visiting friends, reading, or sitting or lying down to watch television.

7. During the **last 7 days**, how much time did you spend for **sitting** on a **week day**?

_____hours per day

_____minutes per day

Do not recall/Not sure

Section C

Please read each statement and circle a number 0, 1, 2 or 3 which indicates how much the statement applied to you over the past week. There are no right or wrong answers. Do not spend too much time on any statement.

The rating scale is as follows:

Did not apply to me at all 0	Applied to me to some degree, or some of the time 1	Applied to me to a considerable degree or a good part of time 2	Applied to me very much or most of the time 3
--	---	---	---

No.	I ...	Rating			
		0	1	2	3
1.	found it hard to wind down (s)	0	1	2	3
2.	was aware of dryness of my mouth (a)	0	1	2	3
3.	couldn't seem to experience any positive feeling at all (d)	0	1	2	3
4.	experienced breathing difficulty (e.g. excessively rapid breathing, breathlessness in the absence of physical exertion) (a)	0	1	2	3
5.	found it difficult to work up the initiative to do things (d)	0	1	2	3
6.	tended to over-react to situations (s)	0	1	2	3
7.	experienced trembling (e.g. in the hands) (a)	0	1	2	3
8.	felt that I was using a lot of nervous energy (s)	0	1	2	3
9.	was worried about situations in which I might panic and make a fool of myself (a)	0	1	2	3
10.	felt that I had nothing to look forward to (d)	0	1	2	3
11.	found myself getting agitated (s)	0	1	2	3
12.	found it difficult to relax (s)	0	1	2	3
13.	felt down-hearted and blue (d)	0	1	2	3
14.	was intolerant of anything that kept me from getting on with what I was doing (s)	0	1	2	3
15.	felt I was close to panic (a)	0	1	2	3
16.	was unable to become enthusiastic about anything (d)	0	1	2	3
17.	felt I wasn't worth much as a person (d)	0	1	2	3
18.	felt that I was rather touchy (s)	0	1	2	3
19.	I was aware of the action of my heart in the absence of physical exertion (e.g. sense of heart rate increase, heart missing a beat) (a)	0	1	2	3
20.	felt scared without any good reason (a)	0	1	2	3
21.	felt that life was meaningless (d)	0	1	2	3

Section D

Please read each statement and answer correctly.

1. Do you currently smoke any tobacco products such as cigarettes, cigars or pipes?

Yes No

2. Do you currently smoke tobacco products daily?

Yes No

3. How old were you when you first start smoking age (years) daily?

4. Do you remember how long ago it was?

Yes No

5. On average how many following do you smoke each day?

6. In the past, did you ever smoke daily?

Yes No

7. How old were you when stop smoking daily?

8. How long ago did you stop smoking daily?

9. Have you ever consumed alcohol drink such as beer, wine, spirits, fermented cider or [add other local example]?

Yes No

10. Have you consumed alcohol drink within the past 12 months?

Yes No

11. During the past 12 months, how frequently have you had at least one alcoholic drink?

Daily 5-6 days per week less than once a month
-3 days per month 1-4 days per week

12. Have you consumed an alcoholic drink within the past 30 days?

Yes No

13. During the past 30 days, on how many occasions did you have at least one alcoholic drink?

Section E

How confident are you right now that you could exercise three times per week for 20 minutes if?

	Not confident					Very confident					
01. the weather was bothering you	0	1	2	3	4	5	6	7	8	9	10
02. you were bored by the program or activity	0	1	2	3	4	5	6	7	8	9	10
03. you felt pain when exercising	0	1	2	3	4	5	6	7	8	9	10
04. you had to exercise alone	0	1	2	3	4	5	6	7	8	9	10
05. you did not enjoy it	0	1	2	3	4	5	6	7	8	9	10
06. you were too busy with other activities	0	1	2	3	4	5	6	7	8	9	10
07. you felt tired	0	1	2	3	4	5	6	7	8	9	10
08. you felt stressed	0	1	2	3	4	5	6	7	8	9	10
09. you felt depressed	0	1	2	3	4	5	6	7	8	9	10

Section F

Please read each statement and tick a number. There are no right or wrong answers.

Please check a response for each of the following statements:	Always 3	Usually 2	Often 1	Some times 0	Rarely 0	Never 0
Am terrified about being overweight.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Avoid eating when I am hungry.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Find myself preoccupied with food.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Have gone on eating binges where I feel that I may not be able to stop.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Cut my food into small pieces.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aware of the calorie content of foods that I eat.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Particularly avoid food with a high carbohydrate content (i.e. bread, rice, potatoes.)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feel that others would prefer if I ate more.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Vomit after I have eaten.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Feel extremely guilty after eating.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Am preoccupied with a desire to be thinner.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Think about burning up calories when I exercise.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Other people think that I am too thin.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Am preoccupied with the thought of having fat on my body.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
1. Take longer than others to eat my meals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
2. Avoid foods with sugar in them.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
3. Eat diet foods.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
4. Feel that food controls my life.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
5. Display self-control around food.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
6. Feel that others pressure me to eat.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
7. Give too much time and thought to food.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
8. Feel uncomfortable after eating sweets.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
9. Engage in dieting behavior.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
10. Like my stomach to be empty.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
11. Have the impulse to vomit after meals.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
12. Enjoy trying new rich foods.	<input type="checkbox"/> 0	<input type="checkbox"/> 0	<input type="checkbox"/> 0	<input type="checkbox"/> 1	<input type="checkbox"/> 2	<input type="checkbox"/> 3
Total Score:						