UNIVERSITI PUTRA MALAYSIA

RELATIONSHIP OF STRESS LEVEL AND HEALTH STATUS WITH PHYSICAL ACTIVITIES AMONG MEDICAL STUDENTS IN UPM DURING COVID-19 PANDEMIC

GROUP 37

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RELATIONSHIP OF STRESS LEVEL AND HEALTH STATUS WITH PHYSICAL ACTIVITIES AMONG MEDICAL STUDENTS IN UNIVERISTI PUTRA MALAYSIA, SERDANG,SELANGOR

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Abstract

Introduction: According to the World Health Organization (WHO), physical activity was defined as any bodily movement produced by skeletal muscles that require energy expenditure. A regular and adequate level of physical activity was also crucial for energy expenditure and thus fundamental to weight control. It was also believed that physical activity can help to reduce the stress level of an individual.

Objective: This study aimed to determine the prevalence of stress among medical students in Universiti Putra Malaysia (UPM) and the association between level of physical activities, stress levels and health status among medical students in Universiti Putra Malaysia (UPM).

Materials and Methods: A cross-sectional study would be conducted in 5 months among Doctor of Medicine students in Universiti Putra Malaysia (UPM). Descriptive

analysis and non-parametric analysis would be used to present the data and establish any association of statistical significance between independent and dependent variables.

Result: Out of 310 respondents, 155 (50.0%) of respondents were highly active for the past 5 months. Majority of respondents,196 (63.2 %) out of 310 were reported to have normal body weight. 182 (58.5 %) respondents out of 310 have moderate stress. There were significant associations between ethnicity ($p < 0.001$), religion ($p < 0.001$) and year of study ($p = 0.041$) with stress level among medical students in Universiti Putra Malaysia (UPM).There were no significant associations between physical activities and stress level ($p = 0.306$) among medical students in Universiti Putra Malaysia (UPM). There were no significant associations between physical activities and body mass index ($p = 0.172$) among medical students in Universiti Putra Malaysia (UPM).

Discussion : Our study showed the prevalence of "inactive" medical students in UPM was higher compared to study conducted in Bangalore, India. COVID-19 circumstances and quarantine period during our study duration caused practices of sedentary lifestyles among medical students in UPM. In our study, there was a lower prevalence of high perceived stress compared to study in Iraq. The study in Iraq concluded that the examinations, course load and hectic timetable were the major reasons for their results of their higher severe stress level among students in comparison to our research study. Our study showed a significant association of ethnicity , religion and year of study with stress levels among medical students in UPM.In our study, the respondents were mainly Malay medical students which may contribute to higher frequency of stress among them. Cultural differences and religious practises might attribute the increase in emotional

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distress among Malays and other races.Our research determined the highest prevalence of stress among second year students as they might be busy in preparing for their research study, attending online classes and busy revising for their professional exam 1. Our study showed no significant association of physical activity and stress levels among medical students.Our results may have been confounded with medical students involved in the study more than doing physical activity.There was no statistically significant association between body mass index and physical activity among medical students in UPM through our study.However, our study revealed that 192 respondents who were physically active have normal body weight.. It is well established that physical activity practise can have major health benefits in terms of both preventive and therapeutic effects

Conclusion: This study showed that there is no significant association between physical activity and stress level and health status among medical students in Universiti Putra Malaysia.

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CHAPTER 1

INTRODUCTION

1.1 Background

It was believed that physical activity can help to reduce stress and improve the health level of an individual. According to the World Health Organization (WHO), physical activity was defined as any bodily movement produced by skeletal muscles that require energy expenditure. It was estimated that physical inactivity was the main cause for approximately 21–25% of breast and colon cancers, 27% of diabetes and approximately 30% of ischaemic heart disease burden (World Health Organization, 2008). Individuals could reduce the risk of non-communicable diseases such as hypertension, coronary heart disease, stroke, diabetes and cancer by doing physical activity regularly. A regular and adequate level of physical activity was also an important key determinant for energy expenditure and thus fundamental to weight control.

Moreover, physical activity was an effective component of stress management. Stress was defined as the disruption of the body's homeostasis or a state of disharmony in response to a real or perceived threat or challenge (Chrousos GP, Gold PW, 1992). Stress was a significant individual and public health problem which was often associated with numerous physical and mental health problems. Typically, physical activity and stress research had focused on aerobic exercise. It was studied in consistent research that people had been reported to feel calmer after 20 minutes of aerobic exercise and the calming effect could last for several hours after exercise. In recent years, mind-body types of exercise such as yoga or Tai Chi had been proven to be

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effective in reducing stress (Cheung WM, 2011). To the best of our knowledge, we would assess whether regular physical activity helped to improve the health status and reduced stress levels of the participants.

1.2 Problem Statement

Studies had determined that medical students faced a high level of stress during their undergraduate course (Rosal M C et al., 1997). A high level of stress may affect negatively on the cognitive function and learning of medical students in universities (Dahlin M et al., 2005). Previous studies also suggested that mental health became worse after students began medical school and remained poor throughout the training (Rosal M C et al., 1997). Study reported that 56% of Malaysian medical students were under stress. The level of stress was crucial during the transition from preclinical to clinical year as the medical students were more likely to become exhausted due to the new environment when entering clinical year (Salam A et al., 2013).

The aim of our study was to determine the prevalence of stress among medical students in UPM and determine the association between level of physical activities, stress level and health status of medical students in Universiti Putra Malaysia.

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1.3 Research Questions

I. What is the association between sociodemographic factors, health status and stress levels among medical students in Universiti Putra Malaysia(UPM) during Covid-19 pandemic?

II. What is the association between level of physical activity, health status and stress levels among medical students in Universiti Putra Malaysia(UPM) during Covid-19 pandemic?

1.4 Objectives

1.4.1 General objectives

To determine the prevalence of stress among medical students in UPM and the association between level of physical activities, stress levels and health status among medical students in UPM during Covid-19 pandemic.

1.4.2 Specific objectives

I. To determine the prevalence of stress among medical students in UPM during Covid-19 pandemic.

II. To determine the association between sociodemographic factors (gender, age, ethnicity, religion, year of study) and stress levels among medical students in UPM during Covid-19 pandemic.

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III. To determine the association between level of physical activities and stress levels among medical students in UPM during Covid-19 pandemic.

IV. To determine the association between level of physical activities and health status (weight, height and body mass index) among medical students in UPM during Covid-19 pandemic.

1.5 Hypothesis

I. H1: There is an association between sociodemographic factors and stress level among medical students in UPM during Covid-19 pandemic.

II. H2: There is an association between level of physical activities and stress levels among medical students in UPM during Covid-19 pandemic.

III. H3: There is an association between level of physical activities and health status among medical students in UPM during Covid-19 pandemic.

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1.6 Significance of study

This research would decide whether or not the relationship was formed between stress, health, and physical exercise. Therefore, from this, we would help to make people more aware of the benefits of physical health by providing relevant information in this study. Moreover, by providing this research also, we could help medical students in releasing and managing stress by creating awareness regarding the effects of physical exercise on stress and health status. Furthermore, by doing this research we could help in future research by other researchers by providing our research outcomes and results as a reference. In conclusion, we hoped that our study could help convince society and be useful in making future guidelines for policymaking about physical exercise and stress.

1.7 Limitations of study

Based on the study that we conducted, we could foresee that there would be some limitations that we would encounter during this research or study. The coronavirus pandemic was affecting our community and social lives due to social distancing and other measures to counter the spreading of the virus. This would affect our research because it would be challenging to conduct due to a lack of communication and approach to the participants.

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CHAPTER 2

LITERATURE REVIEW

2.1 STRESS

Stress was derived from the Latin verb stringo (stringere), which meant binding or drawing close, but also grazing, scratching, plucking or prune. It came into English as a modified form of distress or distraint in the 14th century (Hayward R. 2005). He also explained that this referred to physical difficulty or trial in its early uses but also suggested a form of physical injury by the 16th century. Stress was seen in these early uses as an unpleasant condition of the world rather than of the person. The word "stress" was used to describe the effects of something that would seriously affect homeostasis. The actual or perceived threat to an organism was referred to as the "stressor" and the response to the stressor was called the "stress response." Although stress reactions had evolved as adaptive processes, Selye observed that severe, prolonged stressful events could result in tissue damage and chronic disease. In addition, stress could also be referred to in engineering and dentistry as physical or emotional tension, minor irritants, life problems, verbal emphasis, or problem forces (Hayward R, 2005). Furthermore, Susan M., (2002) states that stress was the psychological and physical state which resulted when the individual's resources were insufficient to meet the demands and pressures.

According to Liza Varvogli and Christina Darviri (2011), there was a growing amount of research relating stress to cardiovascular disease, the future development of hypertension linked to the reaction of the person to stress, metabolic syndrome, obesity, emotional overeating,

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while stress fueled nearly fifty percent of cases of depression through interference of the HPA axis and increased levels of cortisol. Our central nervous system tended to produce integrated coping responses rather than single, isolated response changes (Hilton, 1975 as cited in Neil et al., 2008). As such, when immediate fight-or-flight appeared feasible, mammals tended to show increased autonomy and hormonal activity that maximized muscle exertion potentialities (Cannon 1929, Hess 1957).

There were several signs of stress which could be seen in people's behavior. Acute responses to stress may be in the areas of feelings, behavior, thinking, or physical symptoms. If stress persists, the functioning of neuroendocrine, cardiovascular, autonomic and immunological changes eventually led to disease and disability (Susan W. , 2002). Severe perceived stress was associated with worse academic achievement and worse physical health, as well as higher rates of psychiatric and impulsive disorders (Leppink et al., 2016).

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2.2 PREVALENCE OF STRESS AMONG MEDICAL STUDENTS

Medical schools were always regarded as highly stressful. It was responsible for ensuring that medical students obtained sufficient knowledge and skills before taking professional responsibilities. Some studies had described the stressors of medical school and its associating negative impact on the physical and mental health of medical students (Aktekin M et al., 2001). Adequate stress was necessary and crucial for medical students to learn better (Linn BS et al.,1984). However, too much stress could cause physical and mental health issues to students. It would reduce students' self-esteem and could negatively impact academic achievement and professional development (Kaplan HI et al., 2000).

High rates of psychological problems among students, such as depression and anxiety, had been reported in several studies (Dyrbye LM et al., 2005). Most of the stressful conditions were found to be related to stress from medical school especially medical training rather than personal problems in life. Anxiety and depressive problems were found to be connected with fears of failing, workload, personal endurance, and lack of time for other activities (Mofatt KJ et al., 2004). Production of resilient health care professionals who could cope with stress well with well-equipped hospitals and conducive was important as a way to increase positive outcomes and reduce negative outcomes of stress in the health profession (McCann CM et al., 2013).

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2.3 SOCIODEMOGRAPHIC FACTORS OF STRESS LEVEL

It was studied that higher education was very stressful and medical school was even more stressful as compared to students of other courses. There was a higher risk of stress and mental health problems in females compared to males (Bhatia MS et al., 1995). Students of Malay ethnicity had significantly higher stress in studies when compared to Chinese and Indian students. On the other hand, Chinese students had higher stress than Malay students from the perspective of financial stress (Sidhu JK et al., 2007). Stress was one of the important causes that brought a negative impact on the academic performance of the students. A study showed that stress level was more prevalent in first year medical students when compared to third year students. High prevalence of stress in first year may be because of the newly introduced learning and a shift from the traditional class-centered teaching method to a self-directed student-centred teaching method. Reducing stress level in third year students may be due to their gradual adaptability by time (Salam A et al., 2015).

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2.4 EFFECTS OF COVID-19 PANDEMIC ON STRESS LEVEL OF STUDENTS

Covid-19 has become a pandemic which was raising global concerns of widespread panic and increasing stress and anxiety in individuals around the world (World Health Organization, 2020). It was caused by a novel coronavirus which was detected in December 2019 in Wuhan (Hubei province). Confirmed cases and deaths grew rapidly every day, and on 5th of April there were more than 1,200,000 confirmed cases globally and more than 68,000 people had died from this virus (Johns Hopkins University & Medicine, 2020). Previous studies conducted during H1NI and SARS in China had determined an obvious elevation of anxiety and stress level in university students (Jia et al., 2003). Moreover, studies had shown an increase in students' concerns not only for their education, but also for the well-being of their families in case of their return home because of suspended in-person classes (Zhai Y et al., 2020). By reviewing previous study and knowing the expected impact of the situation on this community, it was essential to analyze the experience of university students during the COVID-19 pandemic and confinement in order to develop policies and implement psychological interventions wisely adjusted to this situation. That would help minimize the possible adverse effects on education, work and mental health among the university members (Odriozola-González, P. et al., 2020).

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2.5 PHYSICAL ACTIVITIES

The World Health Organization (WHO) defined physical activity as any bodily movement produced by skeletal muscles that result in energy expenditure. It was identified that Malaysia was one of the least physically active countries in the world with more than 60% of adults having a sedentary lifestyle. According to the National Health and Morbidity Survey, the rates of physical activity among the Malaysian population had decreased dramatically over the thirty years, while the rates of type-2 diabetes had increased 4-fold (The Third National Health and Morbidity Survey (NHMS III), 2006) and obesity had risen by 280% (Rampal L, 2007). The World Health Organization (WHO) suggested individuals to participate in moderate physical activity for at least 150 minutes per week. Lower levels of physical activity were closely correlated with obesity and non-communicable diseases such as type-2 diabetes and hypertension (WHO, 2003). A few studies had shown that adults that practice physical activity regularly were healthier and had better physical fitness than physically inactive adults in different countries and populations groups (D. Kuh, E. J. Bassey, 2005). Therefore, physical activity was promoted as part of a healthy lifestyle (WHO, 2010).

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2.6 EFFECTS OF PHYSICAL ACTIVITIES ON STRESS AND HEALTH LEVEL

According to a research (Matthew A. Stults-Kolehmainen and Rajita Sinha, 2015) stated that physical activity reduced stress level and improved mental health among numerous populations. Nonetheless, the exercise intensity may play a key role as those who engaged in a moderately intense exercise experienced about half the amount of stress perceived as those who did not report exercise. Randomized clinical trials found exercise to be a successful way to enhance perceived stress, stress symptoms and quality of life. Exercise neutralized the influence of psychological stressors on cardiac reactivity and dampened the rise in stress hormones induced by stressors.

Based on the other research published by Fleshner M (2005), it was shown that exercising prevented the physical health impact of stress. For example, exercise reduced immunosuppression caused by stress.

Research on physical activity and mental health carried out by Ashish Sharma, Vishal Madaan, Frederick D. Petty (2006) showed that exercise enhances mental health by decreasing anxiety, depression and depressive mood and by improving self-esteem and cognitive performance. Exercise had also been shown to relieve symptoms such as low self-esteem and social withdrawal. Thus, physical activity improved sleep, acted as stress relief, reduced tiredness that can increase mental alertness, caused weight reduction and improved cardiovascular fitness.

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2.7 EVALUATING HEALTH STATUS USING BODY MASS INDEX (BMI)

Obesity had become one of the challenging public health issues in the contemporary global community (Bassett et al, 2004). In recent years, research had discovered the gradual increase in adult, adolescent, and child obesity for the last thirty years (Anderson et al, 2006), with many contributing factors studied as the causes. The reduction of manual labour (Finkelstein et al, 2005), increased in indoor time (Kimbro et al, 2011) and overconsumption of cheap calories (Freund et al, 2008) had been proven to contribute to this obesogenic lifestyle in these years. BMI, which was conceptualized by Adolphe Quetelet in On Man and the Development of his Faculties, or Essays on Social Physics (1842), was a measurement of height in meter and mass in kg to calculate the body fat percentages within the population. After calculating the BMI of individuals, they were categorized as obese, overweight, and normal weight. The World Health Organization (WHO) had advised that an individual should maintain a BMI of 18.5 to 24.9 kg/m2 in order to maintain optimum health. Individuals also had to practice a healthy lifestyle and have the right self-perception about their own body condition in order to prevent obesity and other non-communicable diseases. Studies in developed countries had found out that misperception of body weight was reported as high as 42%, which means there were large number of obese and overweight people tended to under perceive their weight (Yan et al, 2018). BMI was clearly not a perfect indicator of health status. When an individual was overweight or obese, BMI was still a useful and convenient starting point for important conditions that became more likely.

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2.8 EVALUATING STRESS LEVEL USING PERCEIVED STRESS SCALE (PSS)

Stress was an essential reference point in health research as it was often related to both an individual's general health status and different health problems such as mental disorders, cardiovascular disease, cancer, drug abuse and so on. One of the most commonly used methods of evaluating psychological stress was the Perceived Stress Scale (PSS) (Cohen et al., 1983). Rather than focusing on specific experiences, the Perceived Stress Scale (PSS) produced a global stress score that was based on general questions. Initially, the PSS was a 14-item scale. It was then decreased to 10 items (Cohen et al., 1988) when researchers identified and removed four inefficient items. The PSS scales had been translated to several languages and countries, which showed the importance of stress among different societies in this era. The PSS was a 10-item questionnaire to assess the stress level in the respondents by evaluating feelings and thoughts during the last month. Each item was scaled from 0 (never) to 5 (very often) with a range of 0 to 40 for the total score of the scale. Higher scores will indicate higher stress levels on this scale (Cohen et al., 1983). Six items of the PSS-10 assessed for stress and 4 items measured for coping strategy to stress.

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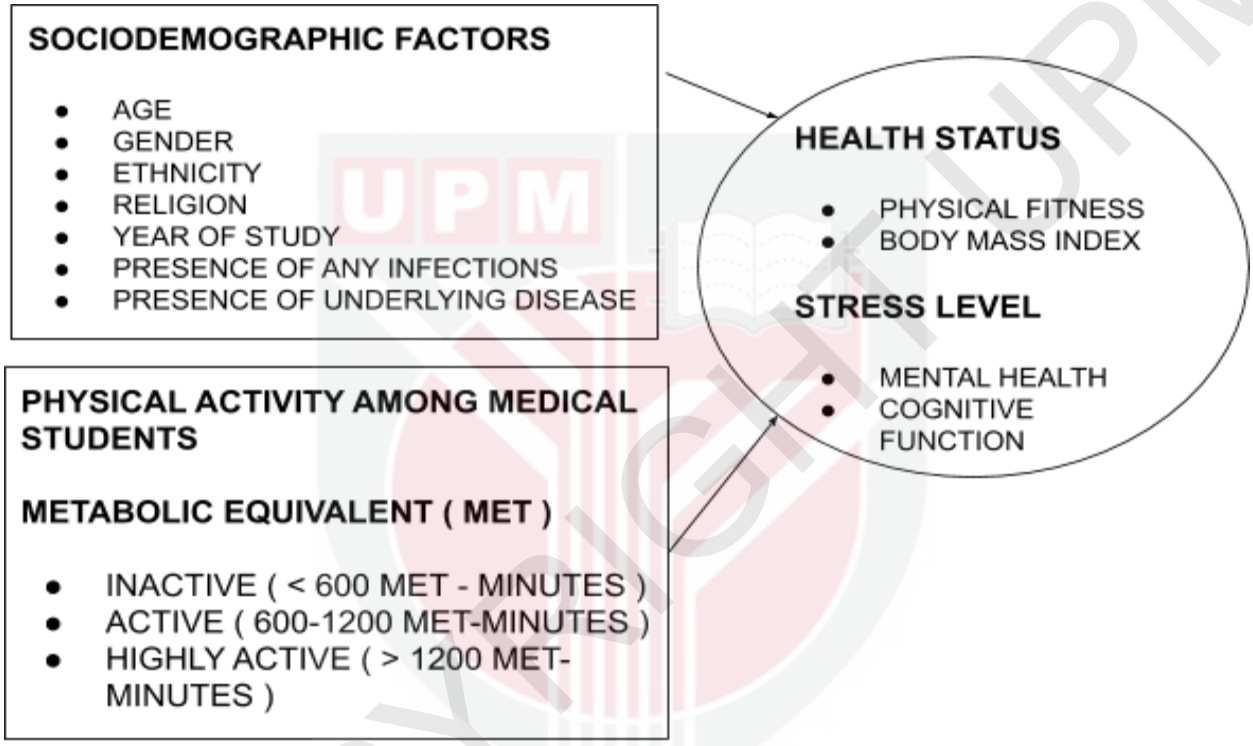
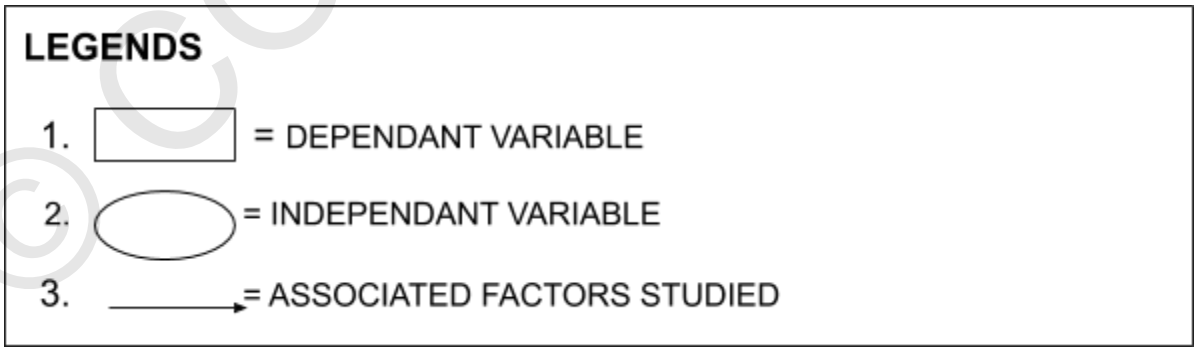
2.9 CONCEPTUAL FRAMEWORK

Below was a conceptual framework of physical activity among medical students in UPM and its dependent variables;sociodemographic factors, health status and stress level.





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CHAPTER 3

METHODOLOGY

3.1 STUDY LOCATION

The study was carried out in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia (UPM), Serdang, Selangor.

3.2 STUDY DESIGN

The study design that was used in this study was a cross-sectional study.

3.3 STUDY DURATION

The study duration started from 27th April 2020 until 9th October 2020.

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3.4 SAMPLING

3.4.1 Study population

The study population for this research consisted of all medical students from year 1 until year 4 of University Putra Malaysia. ***Year 5 students were not included in the study to avoid non-response bias as the students would be busy for their clinical posting.***

3.4.2 Sampling population

The sampling population were medical students from the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia(UPM) who could participate in this research.

3.4.3 Selection Criteria

3.4.3.1 Inclusion criteria

- Year 1 to year 4 medical students in Faculty of Medicine and Health Sciences (FMHS), UPM

3.4.4 Sampling Frame

List names of medical students from all years which is from year 1 to year 4 from University Putra Malaysia.

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3.4.5 Sampling Unit

The sampling unit was a medical student from the Faculty of Medicine and Health Sciences (FMHS), UPM that fulfills the inclusion criteria.

3.4.6 Sampling method

This research would be using a stratified random sampling method. There were four strata for this research, each consisting of a Year of Study from the MD programme, which was Year 1, Year 2, Year 3 and Year 4 respectively. Each stratum was represented proportionally in the total study population, which was counted by taking the number of medical students in a year divided by the total number of medical students and subsequently multiplying by the total sample size required. Thus, we would have a study sample that was represented by students from each year. For each stratum, each medical student would be assigned a number. Those whose assigned number matched a list of numbers generated via computer random number generator would be selected as a sample of this research.

3.4.7 Sampling size

This study was conducted to determine the effects of level of physical activities on health status and stress levels of medical students in University Putra Malaysia. The sample size was calculated based on the objectives of this study.

The table below was the sample size estimation according to the objectives.

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Objectives	Sample size estimation
1	265
2	107
3	11
4	160

Based on the table above, objective 1 was used to estimate the sample size for our study because we could get the highest number of sample sizes compared to other objectives.

Sample size calculation based on objective 1 were determined as follows:

Based on Objective 1: To determine the prevalence of stress among medical students in UPM.

The study by Edimansyah et al (2006) regarding the Prevalence and Associated Factors of Stress in Dental Healthcare Workers of a Higher Institution of Learning in Kelantan was used as a reference.

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$$n = \frac{z_{1-\alpha/2}^2}{d^2} P\,(1-P)$$

Where:

n = estimated total sample size

P = prevalence of stress, (22.2%)

Z (1α/2) = 1.96 for 95% CI

d = 0.05

Calculation:

n = 1.96^2 (0.222)(1-0.222)/0.05^2

n = 265.4 people

≈ 265 were minimum sample sizes required based on objective 1.

So the most optimum number of a sample size to choose was 265 based on population study.

+ 10% non-response bias.

Thus,

= 265 + (10% × 265)

= 292 respondents need to be sampled.

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Therefore, a total of 292 students were needed to estimate the population with a 95 percent level of confidence. This study used a stratified random sampling method to obtain equal representation from each year of study. The sample consisted of four strata based on the year of study in the Doctor of Medicine (MD) in FMHS, UPM. Each stratum contributed a certain percentage to the total sample size. For example, for Year 2, there were 116 students, and an estimated 413 medical students in total. Table 3.1 showed the distribution of the estimated sample size based on the year of study.

$= \frac{116}{413}$ x 292

= 82 students

≈ 82 respondents from Year 2 medical students.

Table 3.1: Distribution of estimated sample size based on year of study.

Year of study	Estimated sample size
First Year	77
Second Year	82
Third Year	71
Fourth Year	62

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3.5 DATA COLLECTION

3.5.1 STUDY INSTRUMENT

Online questionnaires were adapted from previously developed questionnaires with the permission received from original authors. For those respondents who did not have internet access, we would send the physical questionnaire to their exact location, the respondent would be approached 4 times to make sure they will answer the questionnaire form. It was made up of 5 sections which include the sociodemographic aspects of respondents, questions on Covid-19 pandemic, GPAQ version 2, BMI and PSS-10.

Section A consisted of questions regarding the sociodemographic aspects of respondents. Age, gender, race, religion, year of study and lifestyle factors were obtained from the respondents in this section. Section B was to determine the participants' situation during Covid-19 pandemic. Section C was to determine the level of physical activities of respondents. Section D was set up to get the weight, height and BMI of participants. Lastly, section E was set up to obtain stress levels in respondents.

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3.5.2 RELIABILITY AND VALIDITY

A: Global Physical Activity Questionnaire(GPAQ)

Content validity and reliability: The questionnaire was taken from the World Health Organization (WHO) who developed this 16-item outcomes instrument. This questionnaire would be assessed by the members of supervisory teams. Comments were recorded and corrections were made if necessary. The reliability and validity tests for the questions were tested from previous studies and claimed to be highly reliable with the internal consistency, Cronbach's alpha of 0.83-0.96 (Herrmann et al., 2020).

B: Perceived Stress Scale 10 (PSS-10)

Content validity and reliability: The questionnaire was taken from a study by Cohen et al. (1988) who developed this self-administered ten-item outcomes instrument. This questionnaire would be assessed by the members of supervisory teams. Comments would be recorded and corrections will be made if necessary. The reliability and validity tests for the questions had been tested from previous studies and claimed to be highly reliable with the internal consistency, Cronbach's alpha of 0.754 (Huang et al., 2020).

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3.6 Data Analysis

For the statistical calculation, the statistical software package, IBM SPSS Statistics for Windows, Version 25.0 was used.

Firstly, for descriptive analysis, the categorical data was conducted and it was presented as frequency and percentage. For continuous data, mean and standard deviation were presented for normally distributed data while, for not normally distributed data, the median interquartile range (IQR) was reported. Lastly, Chi-square test was used to determine the association between the dependent and independent variables. The level of significance was set at $\alpha = 0.05$. All hypothesis testing used two-sided tests. The confidence interval is 95% without including 1.

3.7 Study Ethics

Ethics approval was attained from Jawatankuasa Etika Universiti Penyelidikan Melibatkan Manusia (JKEUPM) and the Dean of Faculty of Medicine and Health Sciences UPM with informed consents from participants before the study was conducted.

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3.8 Study Variables

3.8.1 Dependent Variables

The dependent variables in this study were the health status and stress levels of medical students in UPM.

3.8.2 Independent Variables

The independent variables in this study were sociodemographic factors and the level of physical activities of medical students in UPM.

3.9 Operational Definition

Level of physical activities: Physical activity was defined as any bodily movement produced by skeletal muscles that requires energy expenditure (WHO). Physical activity was assessed using GPAQ version 2 questionnaire, where 3 domains of activity(activity at work, travel, and recreation) was assessed. The level of physical activity referred to in the questionnaire was presented as a metabolic equivalent (MET). The physical activity was classified based on MET-minutes into three groups as: Inactive (<600 met- minutes), active (600-1200 met minutes) and highly active (>1200 met-minutes) (Sruthi M V, 2019).

Health status: Health status was defined as an individual's relative level of wellness and illness, taking into account the presence of biological or physiological dysfunction, symptoms, and functional impairment. In this study, it was evaluated by taking the respondents' medical

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condition, weight, height and body mass index(BMI)(Melam G R, et al.,2016). According to WHO classification (2004), BMI standards are as follows: < 18.5 is underweight, 18.5–24.9 Kg/m2 is normal, 25–29.9 Kg/m2 is overweight, 30-34.9 Kg/m2 is class I obesity, 35.0-39.9 Kg/m2 is class II obesity and more than 40 Kg/m2 is class III obesity.

Stress levels: Stress level was defined as a state of mental or emotional strain caused by adverse circumstances. In this study, questionnaires of the 10-item Perceived Stress Scale(PSS-10) were used to evaluate the respondents' stress level (Cohen et al.,1988). Higher scores indicate higher levels of perceived stress. The score between 11 and 26 is low stress level, 27-41 is moderate stress level, 42-56 indicates high-stress level.

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CHAPTER 4

RESULT

4.1 Response Rate

The calculated sample size was 292 respondents. We had sent out 380 responses for our study population but only received back 310 responses. Thus, the response rate was 81.58 %.

4.2 Normality test

4.2. Normality test and other statistical test

The Statistical Package for the Social Science (SPSS) version 25 had been used for the data analysis, data entry and normality testing. Body mass index(BMI) was tested for normality using the Kolmogorov-Smirnov test and Shapiro-Wilk test. Both tests showed p-value < 0.001. All tests done to indicate that body mass index was not normally distributed. The median was 21.386 kg/m^2 with an interquartile range of 4.9 kg/m^2.

Table 4.1: Tests of normality for continuous data

Variable	Kolmogorov-Smirnov		Shapiro-Wilk	
	Z-score	P-values	Z-score	P-values
Body mass index(BMI)	0.125	p<0.001	0.881	p<0.001

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Table 4.2: Skewness and Kurtosis for continuous data

Variable	Skewness	Std. Error	Kurtosis	Std. Error
Body mass index (BMI)	0.750	0.138	4.381	0.276

For descriptive statistics, categorical data (gender, ethnicity, religion, year of study, past infection and underlying illnesses) were analyzed into frequency and percentage, while the numerical data was analyzed using median as the variable was not normally distributed. For analytical statistics, the association between levels of physical activities with stress levels and body mass index were analyzed using Pearson Chi-Square test.

4.3 Descriptive Statistics

4.3.1 To determine the socio-demographic factors of medical students in UPM. (N=310)

Table 4.3 showed the distribution of respondents according to the socio-demographic factors. The majority of respondents were from the age group of more than 20 years old and were female (65%). The majority of ethnic composition was 181 Malay (58.2%). Regarding religion, most of the respondents were Islamic (59.8%). Among the respondents, the highest distribution of year of study was year 1 (29.6%).

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Table 4.3: Distribution of respondents according to the socio-demographic factors of medical students in UPM on relationship of physical activity level with health status and perceived stress score. (N=310)

Cases characteristics	Frequency (n)	Percentage (%)
Gender		
Male	108	34.7
Female	202	65.0
Age		
Less than 20 years old	34	10.9
More than 20 years old	276	88.7
Ethnicity		
Malay	181	58.2
Chinese	66	21.2
Indian	55	17.7
Other	8	2.6
Religion		

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Islam	186	59.8
Hindu	42	13.5
Buddha	48	15.4
Christian	32	10.3
Other	2	0.6
Year of Study in Bachelor in Doctor of Medicine		
Year 1	92	29.6
Year 2	91	29.3
Year 3	63	20.3
Year 4	64	20.6
Total number of people who have infections in the past 6 months		
Yes	66	21.2
No	244	78.5
Total number of people have any underlying diseases		
Yes	51	16.4
No	259	83.3

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4.3.2 To determine the prevalence of physical activity level among medical students in UPM. (N=310)

Table 4.4 showed the prevalence of physical activity level among medical students in UPM. In this study, Global Physical Activity Questionnaire (GPAQ) was used to measure MET minutes per week to evaluate the level of physical activity. For the GPAQ, questions on work, travel from places to places and recreational activities were asked. Moderate physical activity was equal to 4.0 METs and vigorous activity was equal to 8.0 METs. The MET-min per week was calculated as minutes of activity/day × days per week × MET level.The respondents were divided into three categories in which respondents with MET minutes per week of less than 600 were categorized as "inactive". In the meanwhile, respondents with MET minutes per week of between 600 and 1200 were categorized as "active". Lastly, respondents with MET minutes per week of more than 1200 were categorized as "highly active". The prevalence of "highly active" medical students was 49.8%. The prevalence of " active" medical students was 15.1% while the prevalence of "inactive" medical students was 34.7%.

Table 4.4: Distribution of respondents according to the prevalence of physical activity level among medical students in UPM. (N=310)

Characteristics	Frequency (n)	Percentage (%)
Inactive	108	34.8

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Active	47	15.2
Highly Active	155	50
Total	310	100

4.3.3 To determine the prevalence of body mass index among medical students in UPM. (N=310)

Table 4.5 showed the prevalence of body mass index among medical students in UPM. BMI was calculated by using the formula kg/m^2. The respondents were categorized into six groups. Respondents with BMI of less than 18.5 were categorized as "underweight", meanwhile respondents with BMI in between 18.5 and 24.9 were categorized as "normal weight". Moreover, respondents with BMI in between 25.0 and 29.9 were categorized as "overweight" while respondents with BMI in between 30.0 and 34.9 were categorized as "obesity class I ". Lastly, respondents with BMI in between 35.0 and 39.9 were categorized as "obesity class II" while respondents with BMI of more than 40.0 were categorized as "obesity class III".

Table 4.5: Distribution of respondents according to the prevalence of body mass index among medical students in UPM. (N=310)

Characteristics	**Frequency (n)**	**Percentage (%)**

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Underweight	54	17.4
Normal weight	196	63.2
Overweight	34	11.0
Class 1 obesity	14	4.5
Class 2 obesity	10	3.2
Class 3 obesity	2	0.6
Total	310	100

4.3.3 To determine the prevalence of perceived stress scale among medical students in UPM. (N=310)

Table 4.6 showed the prevalence of perceived stress scale among medical students in UPM. Perceived Stress Scale of 10 item(PSS-10) was used to measure the prevalence of perceived stress scale among medical students in UPM. All of the scores in each question were added while the scores for questions 4, 5, 7, and 8 were reversed to get a total score. The respondents were categorized into three groups. Respondents with scores ranging from 0-13 would be considered low stress while respondents with scores ranging from 14-26 would be considered moderate stress. Besides, respondents with scores ranging from 27-40 would be considered high perceived stress.

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Table 4.6: Distribution of respondents according to the prevalence of perceived stress scale among medical students in UPM. (N=310)

Stress Level	Frequency (n)	Percentage (%)
Low stress	95	30.5
Moderate stress	182	58.5
High perceived stress	33	10.6

4.4 Analytic Statistics

4.4.1 To determine the association between socio-demographic factors and stress level among medical students in UPM.

Table 4.7 Association between socio-demographic factors and stress levels among medical students in UPM (N=310)

Cases characteristics	Frequency (n)			Percentage (%)			P - value
	Low stress	Moderate stress	High perceived stress	Low stress	Moderate stress	High perceived stress	

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Age							
Less than 20 years	12	18	4	35.3	52.9	11.8	0.767
More than 20 years	83	164	29	30.1	59.4	10.5	
Gender							
Male	41	59	8	38.0	54.6	7.4	0.082
Female	54	123	25	26.7	60.9	12.4	
Ethnicity							
Malay	45	119	17	24.9	65.7	9.4	< 0.001
Chinese	35	25	6	53.0	37.9	9.1	
Indian	15	31	9	27.3	56.4	16.4	
Others	0	7	1	0	87.5	12.5	
Religion							
Islam	46	123	17	24.7	66.1	9.1	< 0.001
Hindu	10	25	7	23.8	59.5	16.7	
Buddha	28	17	3	58.3	35.4	6.3	

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Christian	11	16	5	34.4	50	15.6	
Others	0	1	1	0	50	50	
Year of study							
Year 1	34	52	6	37	56.5	6.5	0.041
Year 2	19	58	13	21.1	64.4	14.4	
Year 3	20	37	6	31.7	58.7	9.5	
Year 4	22	35	7	34.4	54.7	10.9	
Previous infection in the past 6 months							
Yes	16	43	7	24.2	65.2	10.6	0.424
No	79	139	26	32.4	57.0	10.7	
Underlying disease							
Yes	15	27	9	29.4	52.9	17.6	0.203
No	80	155	24	30.9	59.8	9.3	

According to Table 4.7, Chi-Square test was performed to test for significance of association between sociodemographic factors and stress level. The majority of respondents (18)

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from age group less than 20 years old had moderate stress while most of the respondents (164) from age group more than 20 years old had moderate stress. Chi-Square test showed that there was no significant association between age group and stress level with a p-value ($p=0.767$) .

As for gender, the majority of males (59) were grouped into moderate stress whereas the majority of females (123) were grouped into moderate stress. Analysis test was performed and p value ($p=0.082$) showed that there was no significant association between gender and stress level.

As for ethnicity, Malays and Indians had the highest frequency of moderate stress of 119 and 31 respectively among their races. In the meanwhile, the Chinese had the highest frequency (35) of low stress among their races while other ethnicities had the highest frequency (7) of moderate stress. Chi-square test was performed and the p value ($p<0.05$) showed a significant association between ethnicity and stress level.

Four major religions were Islam, Christian, Hindu and Buddha. Once again, Chi-Square test was performed and it showed a significant association ($p<0.05$).

As for the year of study, the students of year 1, year 2, year 3 and year 4 in UPM had moderate stress. Chi-Square test showed a significant association between year of study and stress level ($p=0.041$).

As for infection in the past 6 months, the analysis test showed there was no significant association between infection in the past 6 months and stress level with p value ($p=0.424$).

Lastly, Chi-square test showed there was no significant association ($p=0.203$) between

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underlying illnesses and stress level. The majority of the respondents who had underlying illnesses had moderate stress (27). As among those who had no underlying illnesses, most of them (155) had moderate stress.

4.4.2 To determine the association between level of physical activities and stress levels among medical students in UPM during Covid-19 pandemic. (N=310)

Table 4.8 Association between level of physical activities and stress levels among medical students in UPM during Covid-19 pandemic. (N=310)

Cases characteristics	Frequency (n)			Percentage (%)			P - value
	Low stress	Moderate stress	High perceived stress	Low stress	Moderate stress	High perceived stress	
Physical activity level							
Inactive	37	62	9	34.3	57.4	8.3	0.306
Active	16	23	8	34.0	48.9	17.0	
Highly Active	42	97	16	30.6	58.7	10.6	

Based on Table 4.8, Chi-square test was performed to test the association between level of physical activities and stress levels. There were 3 categories of physical activity level and

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among them, most of the respondents were highly active as it had the highest frequency which was 155 out of 310 respondents (50%) while “active” respondents with the lowest frequency which was 47 (15.1%). All three levels of physical activities had no significant p-values (p=0.306). Therefore, levels of physical activities had no significant association with stress levels.

4.4.3 To determine the association between level of physical activities and body mass index among medical students in UPM during Covid-19 pandemic. (N=310)

Table 4.9 Association between level of physical activities and body mass index among medical students in UPM during Covid-19 pandemic. (N=310)

Cases characteristics	Frequency (n)						Percentage (%)						P-value
	Underweight	Normal weight	Overweight	Class I obesity	Class II Obesity	Class III Obesity	Underweight	Normal weight	Overweight	Class I obesity	Class II Obesity	Class III Obesity	
Physical activity level													
Inactive	22	85	12	6	3	0	20.4	60.2	11.1	5.6	2.8	0.0	

Active	6	30	4	2	5	0	12.8	63.8	11.6	3.9	1.3	0.0	0.172
Highly Active	54	196	34	14	10	2	17.4	63.2	11.0	4.5	3.2	0.6	

Table 4.9 showed the association of level of physical activities and body mass index among medical students in UPM during Covid-19 pandemic. The hypothesis of the association of level of physical activities and body mass index among medical students was analyzed using the Chi-Square test. This test showed that the p-value is 0.172. This meant the value was not statistically significant. There was no significant association between levels of physical activities and body mass index among medical students in UPM during Covid-19 pandemic.

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CHAPTER 5

DISCUSSION

5.1 Prevalence of physical activity level

From this study, it was revealed that the prevalence of "inactive" medical students in UPM was 34.7%. A study carried out in Bangalore, India showed results whereby among 259 medical students aged from 18 to 22 years old had a prevalence of "highly active" medical students was 41.3%, the prevalence of "active" medical students was 43.2 % while the prevalence of "inactive" medical students was 15.2% (Padmapriya K, Krishna P, Rasu T., 2013). In our study, the prevalence of "inactive" medical students in UPM was higher compared to study conducted in Bangalore, India. COVID-19 circumstances and quarantine period during our study duration caused practices of sedentary lifestyles among medical students in UPM. Packed online classes, assessments and online exams restricted medical students in UPM to have less movements and activities while spending most of their time sitting in front of their laptops or computers.

5.2 Prevalence of perceived stress levels

In our study, only 10.6% of the respondents were recorded to have severe stress. According to a study carried out by Amel Farooq Al Shahwi et al (2018) in Anbar, Iraq shows the higher severe stress (30.2%). Study in Iraq was conducted when students were at their hostels and with the examination was around the corner in comparison to our study where medical

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students were at home to study and to attend classes online during our research study. On top of that, exams were postponed as well, which enables the students to relax and study easily. Besides the study in Iraq concluded that the examinations, course load and hectic timetable were the major reasons for their results of higher severe stress level. A comfortable atmosphere in our study leads to a low number of students to have severe stress.

5.3 Prevalence of body mass index

Our analysis shows that the highest record was the prevalence of average weight of medical students at UPM was 63.2%. A total of 100 students took part in a study in United States of America, 52% were normal weight, 28% were overweight, and 13% were obese (Shalom Kayafa Katuka et al. 2016) .Study findings found that normal weight among students has the highest prevalence, followed by underweight with the lowest overweight and classes of obesity. This clearly indicates a propensity for medical students to have a high weight condition rather than low weight disorders. Most of the medical students in both research studies showed a highest percentage in normal weight that indicates a healthy lifestyle practices.

5.4 Association between sociodemographic factors and perceived stress levels

5.4.1 Age

There was no significant association recorded between age group and stress level ($p = 0.767$). However, the highest number of respondents under the age group of more than 20 years were recorded to have moderate stress compared to respondents under the age group of less than 20 years. A study carried out in Tamil Nadu, India showed statistically

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significant association between age group and stress level with $p < 0.001$. The study also reported a high prevalence of age groups more than 20 years compared to age groups less than 20 years (R. Anuradha et al, 2017). Medical students under the age group of more than 20 years belong to the year of study of 2,3 and 4. Stress levels were seen prevalent for this age group as the medical students were facing their examinations and clinical presentations during our research study. According to research by Neimi and Vainiomaki (2017) stated that during the course, the level of stress steadily increased to reach as high as 40 % by the end of the duration of clinical training.Results from other North American studies also indicate that mental health deteriorates after students enter a medical school and remain poor during the course, especially during the transition from basic science to clinical training (M.R. Thomas et al , 2008).

5.4.2 Gender

There was no significant association recorded between gender and stress levels among medical students in UPM ($p = 0.082$). However, there was a high number of female medical students in UPM, 123 and 25 respondents to have moderate and high perceived stress respectively compared to male respondents. In another study carried out in Riyadh, Saudi Arabia showed no significant association between gender and stress levels as well. According to Kessler psychological distress scale (K 10), mean stress score was higher among females (26.9 ± 8.2) than males (25.6 ± 10.4) with no statistical significance (Abdullah A. Saeed et al, 2016). Females in our study displayed higher levels of stress than males but there is no statistical significance. The number of female medical students is greater than that of male students. In most of the

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literature reviews, women were far more stressed than men. This could be due to social and educational disparities. Women are more likely to sense obstacles and threats as stressful than men.Women have an entirely different hormonal system , which causes them to respond to stress differently and become emotionally drained (Sinha R. et al, 2008).

5.4.3 Ethnicity

There was a statistically significant association between ethnicity and stress levels among medical students in UPM ($p< 0.001$). Out of 310 respondents, Malays (119) showed the highest frequency of moderate stress compared to other ethnicities. A study carried out in Universiti Teknologi Malaysia showed no statistically significant association between ethnicity and stress levels. However, in the studies the stress was also shown to be more prevalent among Malays (Sanil S. et al, 2018). In our study, the respondents were mainly Malay medical students which may contribute to higher frequency of stress among them. Cultural differences and religious practises might attribute the increase in emotional distress among Malays and other races (Chee P. Wong et al, 2017).

5.4.4 Religion

There was a statistically significant association between religion and stress levels among medical students in UPM ($p< 0.001$). Muslim medical students have the highest stress levels compared to other religion. A study was carried out in Georgian Southern University showed no statistically significant association between religion and perceived stress levels with $p=0.468$ (Brianna N. Carter, 2016). In our study, the respondents were mostly Muslim medical students

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which may contribute to higher frequency of stress among them. The higher emotional distress among muslims and others could be attributed to the cultural differences and religious practice (Chee P. Wong et al, 2017). Moreover, higher stress and increasing anxiety symptoms in this population might be explained by the presence of social stigma, which is especially strong within the Muslim community (Ciftci A et al., 2013).

5.4.5 Year of study

Our research found that there was a statistically significant association between year of study and stress levels among UPM medical students ($p=0.041$).The prevalence of stress was highest among second year students compared to other years of study. According to a study carried out by Bashaer Mahboub Al Alwani et al (2018) in Saudi Arabia stated that there was an association between year of study and stress level ($p < 0.001$). Research in Saudi Arabia showed the prevalence of stress was highest among the fourth year students (21.1%) while the lowest stress level was highest among the first-year students (4.8%). In contrast, another study found that first year students have the highest stress level and the level decreased in the subsequent years but increased in their final year (Saeed A et al, 2016). Our research determined the highest prevalence of stress among second year students as they might be busy in preparing for their research study, attending online classes and busy revising for their professional exam 1.

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5.4.6 Presence of any infections and underlying disease

Our study shows no statistically significant association between presence of any infections and underly immune system that eventually manifests a disease. According to a research by Mohd. Ring disease (p= 0.424) and stress levels (p= 0.203) among medical students. However, respondents who had no underlying infection for any infections or underlying disease for the past 6 months were less stress compared to those had the infection or disease.presence of underlying disease because the risk of underlying disease such as obesity, cardiac disease, depression, gastrointestinal issues, and asthma tends to worsen. Studies have shown that the immune system has been strengthened by short-term stress, but chronic stress has a huge influence on theazali Salleh (2008), it was reported that the correlation between stressful life events and psychiatric illness is stronger than the correlation with medical or physical illness.

5.5 Association between physical activity and stress level

There was no statistically significant correlation recorded between physical activity and stress level among medical students in UPM (p= 0.306) in our study. This is contradicting with another study carried out in Kancheepuram, India, the relationship between physical activity and stress level was found to be statistically significant with $p<0.001$ (Satya Raj and Shankar Kanagasabapathy, 2018). As stress affects the brain, the rest of the body experiences the effect as well, with its many nerve connexions.Exercise and physical activity produce endorphins, chemicals in the brain that act as natural painkillers and also improve the ability to sleep, which in turn reduces stress.The stress levels were found to be elevated if the participant indulged in low physical activity (Tsatsoulis A, 2006).Our results may have been confounded with medical

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students involved in the study more than doing physical activity. The participation in sports and social events had beneficial consequences in order to help relieve stress. In particular, the use of exercise has been beneficial in students, with the population reporting enhanced capacity to cope with medical school stress. Our study confirmed these claims of 97 out of 310 medical students who reported taking part in high physical activity and found that 58.7 % had negligible stress levels in their lives (table 4.8)

5.6 Association between body mass index and physical activity

There was no statistically significant association between body mass index and physical activity among medical students in UPM through our study (p= 0.172). However, our study revealed that 192 respondents who were physically active have normal body weight.From a study in India, it was shown that a high prevalence of students (69 %) had average body mass index while practising physical activity (Darshan B et al , 2012). It is well established that physical activity practise can have major health benefits in terms of both preventive and therapeutic effects. A variety of studies carried out to assess university students' physical activity, diet, and fitness status have shown that students ' physical condition and dietary behaviours are very much correlated with their own attitudes towards health promotion and disease prevention.

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CHAPTER 6

CONCLUSION

6.1 Limitations

Albeit this study was successfully conducted in University Putra Malaysia via online questionnaires, there lies a few limitations to our study. First and foremost, the results obtained were affected mainly by a number of methodological limitations. Given the cross-sectional nature of our current study, inferences pertaining to causality and directionality could not be made. Therefore, the temporal sequence of exposure and effect may be difficult to determine. Besides, this study is relatively quick to be conducted since the point of contact with the respondents is only once. Moreover, the nature of this research is single-centered as only one university was chosen. Thus, the results and findings of our study cannot be generalised to apply to every single medical student in all the medical schools located in Malaysia. Furthermore, our literature review on the prevalence of stress among students during the Covid-19 pandemic are limited due to the lack of previous research conducted in Malaysia.

6.2 Recommendations

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Based on the research that we have conducted, we would like to suggest to other researchers to extend their research to the medical students in other medical schools located in Malaysia as our research only covers the medical students in FMHS, UPM. Secondly, we recommend to other researchers to carry out more studies regarding the association between physical activity level and health status and between physical activity level and stress level among medical students in Malaysia. We also recommend to other researchers to guide and explain the definition for each variable to respondents before answering the questionnaire. Last but not least, we suggest to other researchers to surveill the respondent while answering the questionnaire.

6.3 Strength

This has been one of the first few studies conducted on this particular topic of physical activity level, health status and stress level among the medical students in university during the Covid-19 pandemic in Malaysia. This study also gives awareness to the medical students on health status and stress level so that they can know whether they are affected since they will be mailed if they are evaluated to be obese or highly stress. Thus, they can take preventive measures if they are found to be obese or highly stress. Furthermore, this study provides us with baseline information on physical activity level, health status and stress level during the pandemic. This would be of great help for future researchers to compare their data since they know the baseline information as to how many obese or highly stress students exist in the tertiary university.

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6.4 Conclusion

In conclusion, ethnicity, religion and year of study of medical students in UPM are the socio-demographic factors that have association with the perceived stress scale among medical students. Based on the results, we can observe that there was no association between physical activity levels and health status as well as stress levels of medical students in UPM during the Covid-19 pandemic. Most of the medical students in UPM are having moderate stress. Thus, future prospective cohort studies are encouraged to investigate whether being physically active would benefit the stress level of students and would lead to the improvement of medical student performance in the medical field. Other contributing factors causing moderate stress level in the medical student can be further studied to improve the mental health among them.

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APPENDIX

APPENDIX 1: CONSENT FORM

PENERANGAN DAN PERSETUJUAN RESPONDEN

Sila baca maklumat berikut dengan teliti. Sekiranya anda mempunyai sebarang pertanyaan, sila kemukakan kepada penyelidik./*Please read the following information carefully and do not hesitate to discuss any questions you may have with the researcher.*

1.TAJUK KAJIAN/ *STUDY TITLE*

Hubungan antara Tahap Tekanan dan Status Kesihatan dengan Aktiviti Fizikal antara Pelajar Perubatan di Universiti Putra Malaysia semasa Pandemik Covid-19./ *Relationship of Stress Level and Health Status with Physical Activities among Medical Students in UPM during Covid-19 Pandemic.*

2. PENGENALAN/ INTRODUCTION

Kajian ini merupakan sebuah projek yang dijalankan oleh pelajar sarjana muda dan berlangsung dari 27 April 2020 ke 9 Oktober 2020. Kajian ini melibatkan responden daripada kalangan

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pelajar doktor perubatan di Fakulti Perubatan dan Sains Kesihatan Universiti (FPSK) Universiti Putra Malaysia (UPM)./ *This study is done by degree program students from* 27 April 2020 till 9 October 2020. *This study involves respondents from the medical students of Faculty of Medicine and Health Sciences (FMHS) of University Putra Malaysia (UPM).*

Oleh itu, kajian ini akan dijalankan untuk menganalisa kesan aktiviti fizikal jangka pendek terhadap status kesihatan dan tahap tekanan pelajar perubatan di Universiti Putra Malaysia (UPM). / *This study is carried out to determine the effects of level of physical activity on health status and stress level of medical students in Universiti Putra Malaysia(UPM).*

3.APAKAH YANG PERLU ANDA LAKUKAN?

Responden dikehendaki untuk mengisi borang soal selidik yang mengandungi 4 bahagian: Bahagian A, Bahagian B, Bahagian C dan Bahagian D. Responden dibenarkan untuk berhenti daripada menjawab kajian soal selidik ini pada bila-bila masa tanpa sebarang halangan. Responden boleh menolak untuk menyertai kajian ini dan kajian ini tidak akan menjejaskan proses pembelajaran masing-masing. / *Respondents are asked to fill up the questionnaire that has 4 sections:Section A, Section B, Section C and Section D. Respondents are allowed to stop answering the questionnaire at any point of time.* ***The respondents have the right to decline participation and this would not jeopardize their learning process.***

4.SIAPA YANG TIDAK BOLEH MENYERTAI KAJIAN INI?

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Mana-mana pihak yang bukan daripada kalangan pelajar doktor perubatan Fakulti Perubatan dan Sains Kesihatan,Universiti Putra Malaysia. / *Whoever that are not from the medical students of Faculty of Medicine and Health Sciences (FMHS) of University Putra Malaysia (UPM).*

5.APAKAH FAEDAH MENYERTAI KAJIAN INI?

a)KEPADA ANDA SEBAGAI PESERTA?

Penyertaan responden akan membantu pihak pengkaji dalam mengkaji hubungan antara aktiviti fizikal mengenai status kesihatan dan tahap tekanan pelajar perubatan di UPM. Dengan menilai hubung kait antara pemboleh ubah, tindakan susulan akan diambil seperti aktiviti fizikal dan senaman otak dapat dipromosikan dalam kalangan pelajar doktor perubatan di universiti./ *Participation of respondents will help the researchers to determine the association between level of physical activity on health status and stress level among medical students in UPM. By evaluating the association between the variables, appropriate steps can be taken, such as regular physical activity and brain exercise can be promoted to among medical students in the university.*

b)KEPADA PENYELIDIK?

Data yang diperoleh daripada maklum balas responden akan membantu penyelidik untuk menentukan kesan aktiviti fizikal terhadap status kesihatan dan tahap tekanan pelajar perubatan di UPM. Kajian ini juga dapat memberi sumbangan kepada orang ramai kerana dapat membantu pihak berkuasa kesihatan dalam mengembangkan polisi kesihatan dan memberikan input tambahan untuk pembuat dasar sebelum memulai program kurikulum baru dan memberikan bukti untuk mengesyorkan aktiviti fizikal secara berkala bagi pelajar di sekolah. / *Data that is*

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obtained from the feedback of respondents will assist the researchers to determine the effects of level of physical activities on health status and stress levels among medical students in UPM. This study can also contribute to the public as it can assist health authorities in developing health policies and provide additional input for policy-makers before embarking on new curriculum programs and supply the evidence for recommending regular physical activity for students in school.

6.ADAKAH IA BERISIKO?

Tiada apa-apa risiko terhadap peserta yang mengambil bahagian dalam menjawab soal selidik ini. Segala maklumat mengenai identiti responden akan disimpan dan tidak akan didedahkan kepada mana-mana pihak./ *There is no risk towards the participants that take part in answering the questionnaire. All information regarding the identities of respondents will be kept confidential.*

7.ADAKAH MAKLUMAT DAN IDENTITI SAYA KEKAL RAHSIA?

Segala bentuk maklumat dan identiti responden yang dinyatakan dalam borang soal selidik tidak akan didedahkan kepada mana-mana pihak./ *All forms of information and identities of respondents that is mentioned in the questionnaire will be kept confidential.*

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

Dr Niazlin binti Mohd Taib (012-3926110) niazlin@medic.upm.edu.my
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Siti Mariam bt Abdul Rashid (01111485570) 199935@upm.edu.my

Sila tandatangan disini sekiranya anda telah membaca dan memahami kandungan halaman ini……...

9.PERSETUJUAN

Saya…….No. Kad Pengenalan……..

Beralamat……

…….....

dengan ini bersetuju untuk mengambil bahagian secara sukarela dalam penyelidikan yang tersebut di atas *(kajian klinikal/ percubaan ubat-ubatan/rakaman video/kumpulan sasaran/temuduga/soal selidik).

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

Saya*berminat / tidak berminat untuk mengetahui keputusan kajian yang melibatkan saya. Saya *setuju / tidak bersetuju untuk imej/ gambar rakaman video /rakaman suara digunakan dalam apa jua bentuk penerbitan atau pembentangan.(sekiranya berkaitan)

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*potong yang tidak berkenaan

Tandatangan…… Tandatangan……

(Responden) (Saksi)

Tarikh:…….

Nama:……..

No. K/P:……

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

Tarikh:…….

Tandatangan……

›9. AGREEMENT

I ……IC No……..

Address……

……

……..with this voluntarily agree to take part in this above study *(clinical research/ medicine trial/ videotaping/ target group/ interview/ questionnaire).

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I have received a clear explanation regarding this study in aspects of methodology, risks and complications. I understand that I have the right to withdraw from this study at any point of time without giving reasons. I also understand that any information that is related to my identity will be kept confidential.

I am * interested/not interested to know the results of the study that is involving me.

I * agree/not agree for pictures, video recording/ voice recording in all forms of publishing and presentations.

*cross-out the irrelevant ones.

Signature…… Signature……

(Respondent) (Witness)

Date:…….

Name:……..

No. K/P:……

I hereby confirm that I have explained characteristics and purpose of the study to this respondent.

Date :..... Signature:……...(researcher)

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APPENDIX 2: BUDGET PLANNING

Item	Cost (RM)
Printing	30.00
Photostatting	20.00
Binding	10.00
Total	60.00

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Appendix 3a: Questionnaire(English Version)

TITLE: Effects of Level of Physical Activities on Health Status and Stress Levels among Medical Students in Universiti Putra Malaysia.

Section A: Sociodemographic factors

1. Gender:

❑ Male

❑ Female

2. Age:

❑ Less than 20 y/o

❑ More than 20 y/o

3. Ethnicity

❑ Malay

❑ Chinese

❑ Indian

❑ Other: _____

4. Religion

❑ Islam

❑ Christian

❑ Hindu

❑ Buddha

❑ Other: _____

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5. Year of study in Bachelor in Doctor of Medicine

❏ Year 1

❏ Year 2

❏ Year 3

❏ Year 4

6. Do you have any infection for the past 6 months?

❏ Yes

❏ No

7. Do you have any chronic illnesses?

❏ Yes

❏ No

If Yes, what is the illness that you have?

❏ Asthma

❏ Congenital disease

❏ Allergy

❏ Others: _____

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Section B: Questions on Covid-19 Pandemic

The following questions are relevant to your condition during Covid-19 pandemic.

1. Have you ever been

A. Diagnosed of having Covid-19?

❏ Yes

❏ No

B. Staying with people diagnosed with Covid-19?

❏ Yes guess

No

C. Had been quarantined for Covid-19

❏ Yes

❏ No

The following will be open-ended questions. You can give more than 1 answer.

For the past 6 months during Covid-19 pandemic,

1. Where do you stay?

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- ❑ Hometown
- ❑ In the Hostel
- ❑ Others: _____

2. How many people were staying with you in each location answered in 1. _____
3. How was your financial condition or support during this period?
   - ❑ Good
   - ❑ Not good
4. Did you take care of other people(children, elderly or people with physical disabilities) during the period?
   - ❑ Yes
   - ❑ No
   - ❑ If Yes, how many people?_____
5. How did you cope with your studies?
   - ❑ Good
   - ❑ Not Good

Section C: Global Physical Activity Questionnaire(GPAQ)

Physical Activity
Next I am going to ask you about the time you spend doing different types of physical activity in a typical week. Please answer these questions even if you do not consider yourself to be a physically active person. Think first about the time you spend doing work. Think of work as the things that you have to do such as paid or unpaid work, study/training, household chores,

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harvesting food/crops, fishing or hunting for food, seeking employment. [Insert other examples if needed]. In answering the following questions 'vigorous-intensity activities' are activities that require hard physical effort and cause large increases in breathing or heart rate, 'moderate-intensity activities' are activities that require moderate physical effort and cause small increases in breathing or heart rate. Please answer the following questions with regard to your activities for the past 6 months.		
Question	**Response**	**Code**
Work		
Does your work involve vigorous-intensity activity that causes large increases in breathing or heart rate like [carrying or lifting heavy loads, digging or construction work] for at least 10 minutes continuously?	Yes 1 No 2 If No, go to P4	P1
In a typical week, on how many days do you do vigorous-intensity activities as part of your work?	Number of days _____	P2
How much time do you spend doing vigorous-intensity activities at work on a typical day?	Hours : minutes _____ : _____	P3
Does your work involve moderate-intensity activity that causes small increases in breathing or heart rate such as brisk walking [or carrying light loads] for at least 10 minutes continuously?	Yes 1 No 2 If No, go to P7	P4
In a typical week, on how many days do you do moderate intensity activities as part of your work?	Number of days ____	P5
How much time do you spend doing moderate-intensity activities at work on a typical	Hours : minutes _____ : _____	P6

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day?		
Travel To and From Places		
The next questions exclude the physical activities at work that you have already mentioned. Now I would like to ask you about the usual way you travel to and from places. For example to work, for shopping, to market, to place of worship.		
Do you walk or use a bicycle (pedal cycle) for at least 10 minutes continuously to get to and from places?	Yes 1 No 2 If No, go to P10	P7
In a typical week, on how many days do you walk or bicycle for at least 10 minutes continuously to get to and from places?	Number of days ____	P8
How much time do you spend walking or bicycling for travel on a typical day?	Hours : minutes _____ : _____	P9
Recreational Activities		
The next questions exclude the work and transport activities that you have already mentioned. Now I would like to ask you about sports, fitness and recreational activities (leisure).		
Do you do any vigorous-intensity sports, fitness or recreational (leisure) activities that cause large increases in breathing or heart rate like [running or football] for at least 10 minutes continuously?	Yes 1 No 2 If No, go to P13	P10
In a typical week, on how many days do you do vigorous-intensity sports, fitness or recreational (leisure) activities?	Number of days ____	P11
How much time do you spend doing vigorous-intensity sports, fitness or recreational	Hours : minutes _____ : _____	P12

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activities on a typical day?		
Do you do any moderate-intensity sports, fitness or recreational (leisure) activities that cause a small increase in breathing or heart rate such as brisk walking, [cycling, swimming, volleyball] for at least 10 minutes continuously?	Yes 1 No 2 If No, go to P16	P13
In a typical week, on how many days do you do moderate-intensity sports, fitness or recreational (leisure) activities?	Number of days ____	P14
How much time do you spend doing moderate-intensity sports, fitness or recreational (leisure) activities on a typical day?	Hours : minutes _____ : _____	P15
Sedentary Behaviour		
The following question is about sitting or reclining at work, at home, getting to and from places, or with friends including time spent sitting at a desk, sitting with friends, traveling in car, bus, train, reading, playing cards or watching television, but do not include time spent sleeping.		
How much time do you usually spend sitting or reclining on a typical day?	Hours : minutes _____ : _____	P16

Section D: Monitoring Index on Health Status

	Results
Height (m)	
Weight (kg)	

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BMI (kg/m2)	

Section E: Perceived Stress Scale-10(PSS-10)

For each question, choose from the following alternatives:

0 - never 1 - almost never 2 - sometimes 3 - fairly often 4 - very often

_____ l. In the last month, how often have you been upset because of something that happened unexpectedly?

_____ 2. In the last month, how often have you felt that you were unable to control the important things in your life?

_____ 3. In the last month, how often have you felt nervous and stressed?

_____ 4. In the last month, how often have you felt confident about your ability to handle your personal problems?

_____ 5. In the last month, how often have you felt that things were going your way?

_____ 6. In the last month, how often have you found that you could not cope with all the things that you had to do?

_____ 7. In the last month, how often have you been able to control irritations in your life?

_____ 8. In the last month, how often have you felt that you were on top of things?

_____ 9. In the last month, how often have you been angered because of things that happened that were outside of your control?

_____ 10. In the last month, how often have you felt difficulties were piling up so high that you could not overcome them?

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Appendix 3b: Questionnaire(Malay Version)

Tajuk: Kesan Aktiviti Fizikal Terhadap Status Kesihatan dan Tahap Tekanan Pelajar Perubatan di Universiti Putra Malaysia

Section A: Faktor Sosiodemografi

1. Jantina

❑ Lelaki

❑ Perempuan

2. Umur

❑ Lebih daripada 20 tahun

❑ Kurang daripada 20 tahun

3. Bangsa

❑ Melayu

❑ Cina

❑ India

❑ Lain-lain

4. Agama

❑ Islam

❑ Christian

❑ Buddha

❑ Lain-lain

5. Tahun Pengajian

❑ Tahun 1

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❑ Tahun 2

❑ Tahun 3

❑ Tahun 4

Section B : Soalan Mengenai Pandemik COVID-19

Soalan-soalan berikut adalah berkaitan dengan keadaan anda semasa pandemik COVID-19.

1. Adakah anda pernah

A) Dikenalpasti menghidapi Covid-19

❑ Ya

❑ Tidak

B)Tinggal bersama dengan pesakit covid-19

❑ Ya

❑ Tidak

C) Kuarantin untuk pengesahan covid-19

❑ Ya

❑ Tidak

Berikut merupakan soalan terbuka di mana anda boleh memilih lebih dari satu jawapan

Selama 6 bulan yang lepas semasa covid-19,

1. Di manakah anda tinggal ?

❑ Rumah

❑ Hostel

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- ❑ Lain-lain :

2. Berapa ramai orang yang tinggal bersama anda di lokasi yang dijawab dalam soalan 1
3. Bagaimana status kewangan anda ketika tempoh kuarantin tersebut?
    - ❑ Bagus
    - ❑ Tidak bagus
4. Adakah anda menjaga orang lain (anak, ibu bapa atau orang kurang upaya) semasa kuarantin tersebut ?
    - ❑ Ya
    - ❑ Tidak
    - ❑ Jika ya , berapa ramai orang ?
5. Bagaimana anda menyesuaikan kehidupan anda dengan pelajaran ?
    - ❑ Bagus
    - ❑ Tidak bagus

Section C: Global Physical Activity Questionnaire Malay Version (GPAQ-M)

Aktiviti Fizikal
Seterusnya, saya akan menyoal anda berkenaan dengan tempoh masa yang anda luangkan untuk melakukan pelbagai kegiatan aktiviti fizikal yang berbeza dalam satu minggu yang biasa. Sila jawab soalan-soalan ini walaupun anda menganggap diri anda tidak aktif. Fikirkan dahulu tentang masa yang anda gunakan untuk bekerja. Anggapkan pekerjaan sebagai perkara yang anda perlu lakukan untuk kehidupan seperti kerja yang berbayar atau tidak berbayar, belajar/ berlatih, kerja di rumah, menuai hasil tanaman, memancing atau memburu untuk

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makanan, mencari pekerjaan, dan sebagainya. Ketika menjawab soalan-soalan berikut, 'aktiviti berat' ialah aktiviti-aktiviti yang memerlukan keupayaan fizikal yang tinggi dan mengakibatkan peningkatan kadar pernafasan ataupun denyutan jantung yang banyak; 'aktiviti sederhana' ialah aktiviti-aktiviti yang memerlukan keupayaan fizikal yang sederhana dan mengakibatkan peningkatan kadar pernafasan ataupun denyutan jantung yang sedikit. Sila jawab soalan berikut berkaitan dengan aktiviti anda selama 6 bulan yang lepas.		
Soalan-soalan	**Maklumbalas**	**Kod**
Aktiviti Fizikal Berkaitan Pekerjaan		
Adakah pekerjaan anda melibatkan aktiviti kerja berat yang mengakibatkan peningkatan yang banyak dalam kadar pernafasan ataupun denyutan jantung seperti berlari, membawa atau mangangkat barang yang berat, menggali, mencangkul, menuai, berkebun, memburu atau melakukan kerja pembinaan sekurang-kurangnya 10 minit secara berterusan?	Ya 1 Tidak 2 Jika tidak, sila ke P4	P1
Biasanya dalam seminggu, berapa harikah anda melakukan kerja-kerja berat dalam pekerjaan anda?	Jumlah hari _____	P2
Pada hari biasa yang anda lakukan kerja berat, berapa lamakah anda melakukannya?	Jam : Minit _____ : _____	P3
Adakah pekerjaan anda melibatkan aktiviti kerja sederhana yang mengakibatkan peningkatan yang sedikit dalam kadar	Ya 1 Tidak 2 Jika tidak, sila ke P7	P4

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pernafasan ataupun denyutan jantung seperti berjalan pantas, membawa barang yang ringan, memancing, membuat kerja rumah, mencuci kereta atau mengecat rumah sekurang-kurangnya 10 minit secara berterusan?		
Biasanya dalam seminggu, berapa harikah anda melakukan kerja-kerja sederhana dalam pekerjaan anda?	Jumlah hari ____	P5
Pada hari biasa yang anda lakukan kerja sederhana, berapa lamakah anda melakukannya?	Jam : Minit _____ : _____	P6
Aktiviti Fizikal Berkaitan Perjalanan		
Soalan-soalan seterusnya TIDAK termasuk aktiviti fizikal semasa bekerja yang telah anda nyatakan. Sekarang, saya ingin bertanya mengenai kaedah yang biasa anda gunakan untuk bergerak dari satu tempat ke tempat yang lain (seperti ke tempat kerja, pasar, membeli-belah, masjid, dan sebagainya).		
Adakah anda berjalan atau berbasikal secara berterusan sekurang-kurangnya 10 minit untuk menuju ke, dan dari sesuatu tempat?	Ya 1 Tidak 2 Jika tidak, sila ke P10	P7
Dalam satu minggu yang biasa, berapa harikah anda berjalan atau berbasikal secara berterusan sekurang-kurangnya 10 minit untuk menuju ke, dan dari sesuatu tempat?	Jumlah hari ____	P8
Dalam satu hari yang biasa, berapa lamakah anda berjalan	Jam : Minit _____ : _____	P9

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atau berbasikal untuk bergerak dari satu tempat ke tempat yang lain?		
Aktiviti Fizikal Pada Waktu Lapang		
Soalan-soalan seterusnya TIDAK termasuk aktiviti semasa bekerja dan semasa perjalanan yang telah anda nyatakan. Sekarang, saya ingin bertanya tentang aktiviti yang anda lakukan untuk rekreasi, kecergasan, dan sukan.		
Pada masa lapang, adakah anda melakukan aktiviti sukan, kecergasan atau riadah yang lasak yang mengakibatkan peningkatan yang banyak dalam kadar pernafasan ataupun denyutan jantung, seperti berlari, jogging, aerobik atau bermain bola sepak, sekurang-kurangnya 10 minit secara berterusan?	Ya 1 Tidak 2 Jika tidak, sila ke P13	P10
Biasanya dalam seminggu pada waktu lapang, berapa harikah anda melakukan aktiviti-aktiviti sukan, kecergasan atau riadah yang lasak?	Jumlah hari ____	P11
Dalam satu hari yang biasa, berapa lamakah anda melakukan aktiviti-aktiviti sukan, kecergasan atau riadah yang lasak?	Jam : Minit _____ : _____	P12
Pada masa lapang, adakah anda melakukan aktiviti sukan, kecergasan atau riadah yang sederhana yang mengakibatkan peningkatan yang sedikit dalam kadar	Ya 1 Tidak 2 Jika tidak, sila ke P16	P13

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pernafasan ataupun denyutan jantung, seperti berjalan pantas, berbasikal, berenang, menanam pokok bunga atau bermain bola tampar, sekurang-kurangnya 10 minit secara berterusan?		
Biasanya dalam seminggu pada waktu lapang, berapa harikah anda melakukan aktiviti-aktiviti sukan, kecergasan atau riadah yang sederhana?	Jumlah hari ____	P14
Dalam satu hari yang biasa, berapa lamakah anda melakukan aktiviti-aktiviti sukan, kecergasan atau riadah yang sederhana?	Jam : Minit _____ : _____	P15
Aktiviti Sedentari Atau Tidak Aktif		
Soalan berikut adalah berkaitan dengan aktiviti duduk atau baring/sandar di tempat kerja, di rumah, semasa dalam perjalanan, atau semasa bersama rakan- rakan. Contohnya, duduk menulis, mengguna komputer, duduk bersama rakan- rakan, perjalanan dalam kereta, bas, keretapi, duduk membaca, bermain kad atau menonton televisyen, TETAPI TIDAK TERMASUK waktu tidur.		
Dalam satu hari yang biasa, berapakah jumlah masa yang anda gunakan untuk duduk atau baring/bersandar?	Jam : Minit _____ : _____	P16

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Section D : Indeks Pemantauan untuk Status Kesihatan

	Keputusan
Ketinggian (m)	
Berat badan (kg)	
BMI (kg/m2)	

Section E : Malay Version of the 10-item Perceived Stress Scale (PSS-10)

Soalan-soalan pada skala ini bertanya tentang perasaan dan fikiran anda sejak bulan lalu.

Dalam setiap kes, anda akan diminta untuk menunjukkan dengan mengisi seberapa kerapkah yang anda merasa atau berfikir dengan cara tertentu.

0 = Tidak pernah; 1 = Hampir Tidak pernah; 2 = Kadang-kadang; 3 = Agak kerap; 4 = Sangat Kerap

1) Pada bulan lalu, berapa kerapkah anda merasa kecewa kerana sesuatu yang terjadi di luar jangkaan anda? _____
2) Pada bulan lalu, berapa kerapkah anda merasa bahawa anda tidak mampu mengawal isu-isu penting dalam hidup anda? _____
3) Pada bulan lalu, berapa kerapkah anda merasa gugup dan tertekan ("stres")? _____
4) Pada bulan lalu, berapa kerapkah anda merasa yakin tentang kemampuan anda untuk menangani masalah-masalah peribadi anda ? _____
5) Pada bulan lalu, berapa kerapkah anda merasa bahawa semuanya berjalan mengikut rancangan anda? _____

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6) Pada bulan lalu, berapa kerapkah anda mendapati bahawa anda tidak mampu mengatasi semua perkara yang anda perlu lakukan? _____

7) Pada bulan lalu, berapa kerapkah anda mampu mengawal perasaan marah dalam hidup anda? _____

8) Pada bulan lalu, berapa kerapkah anda merasa bahawa anda berjaya di atas segala sesuatu? _____

9) Pada bulan lalu, berapa kerapkah anda menjadi marah kerana hal-hal yang berada di luar kawalan anda? _____

10) Pada bulan lalu, berapa kerapkahanda merasa kesulitan yang menimbun begitu tinggi sehingga anda tidak mampu menanganinya? _____

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Appendix 4: Calculation for sample size estimation

Sample size calculation based on objective 2 were determine as follows:

Based on Objective 2 : To determine the association between demographic factors and stress levels among medical students in UPM.

The study by Sani M et al (2012) which is Prevalence of stress among medical students in Jizan University, Kingdom of Saudi Arabia was used as a reference.

$$n = \frac{\{[z_{(1-\alpha/2)} * \sqrt{2\bar{P}(1-\bar{P})}] + [z_{(1-\beta)} * \sqrt{P_1(1-P_1) + P_2(1-P_2)}]\}^2}{(P_1-P_2)^2}$$

Where :

n= Total sample size

$\overline{P}$ = (P1 + P2)/2

P1 = prevalence for female, 0.77 (Sani M et al)

P2 = prevalence for male, 0.64

Z (1-α/2) = 1.96 for 95% CI ; z =1.645 for 90% CI; z = 2.58 for 99% CI

z (1-β) = power = 80% = 0.84

Calculation :

$n = \{[1.96 * \sqrt{2(0.705)(1-0.705)}] + [0.84 * \sqrt{0.77(1-0.77) + 0.64(1-0.64)}]\}$

= 106.7

= 107 people

Sample size calculation based on objective 3 were determined as follows:

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Based on Objective 3: To determine the association between physical activity and stress level (PSS-10 score) among medical students in Universiti Putra Malaysia(UPM).

The study by Magalhaes Das Neves MK et al. (2014) that was conducted in Indonesia on brain gym to increase the academic performance of children aged 10-12 Years Old was used as a reference.

$$n = (z_{1-\alpha/2})^2 (\sigma)^2 / (d)^2$$

Where:

σ = estimated standard deviation (assumed to be equal each group)(6.64) (Magalhaes Das Neves MK et al, 2014)

d = difference to be detected (4)(Magalhaes Das Neves MK et al, 2014)

z(1-α/2) = 95%CI = 1.96; 90% = 1.645; 99% = 2.58

Calculation:

$$n = (z_{1-\alpha/2})^2 (\sigma)^2 / (d)^2$$

N1 = [(1.96 x 1.96) (6.64 x 6.64)] / 4^2

N1 = 169,37 / 16 = 10.59= 11 subjects total

Sample size estimation based on objective 4 were determined as follows:

Based on Objective 4 : To determine the association between physical activities and health status among medical students in UPM.

The study by El-Kholy and Elsayed(2015) regarding the association of physical activity and health status with intelligence quotient of high school students in Jeddah was used as a reference.

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

Where:

r = correlation coefficient, 0.22 (El-Kholy and Elsayed, 2015)

C= correlation

Using the formula above, we calculate and get the result C=0.2237. After determining the value of correlation, we used that value to calculate using the formula below;

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

Where:

N= Total sample size

Z_α= 95%CI = 1.9600

Z_β = 0.8416

Calculation:

$N = [(1.96 + 0.8416)/0.2237]^2 + 3$

$N = [(2.8016)/0.2237]^2 + 3 = 160$ people

≈ 160 were minimum sample sizes required.

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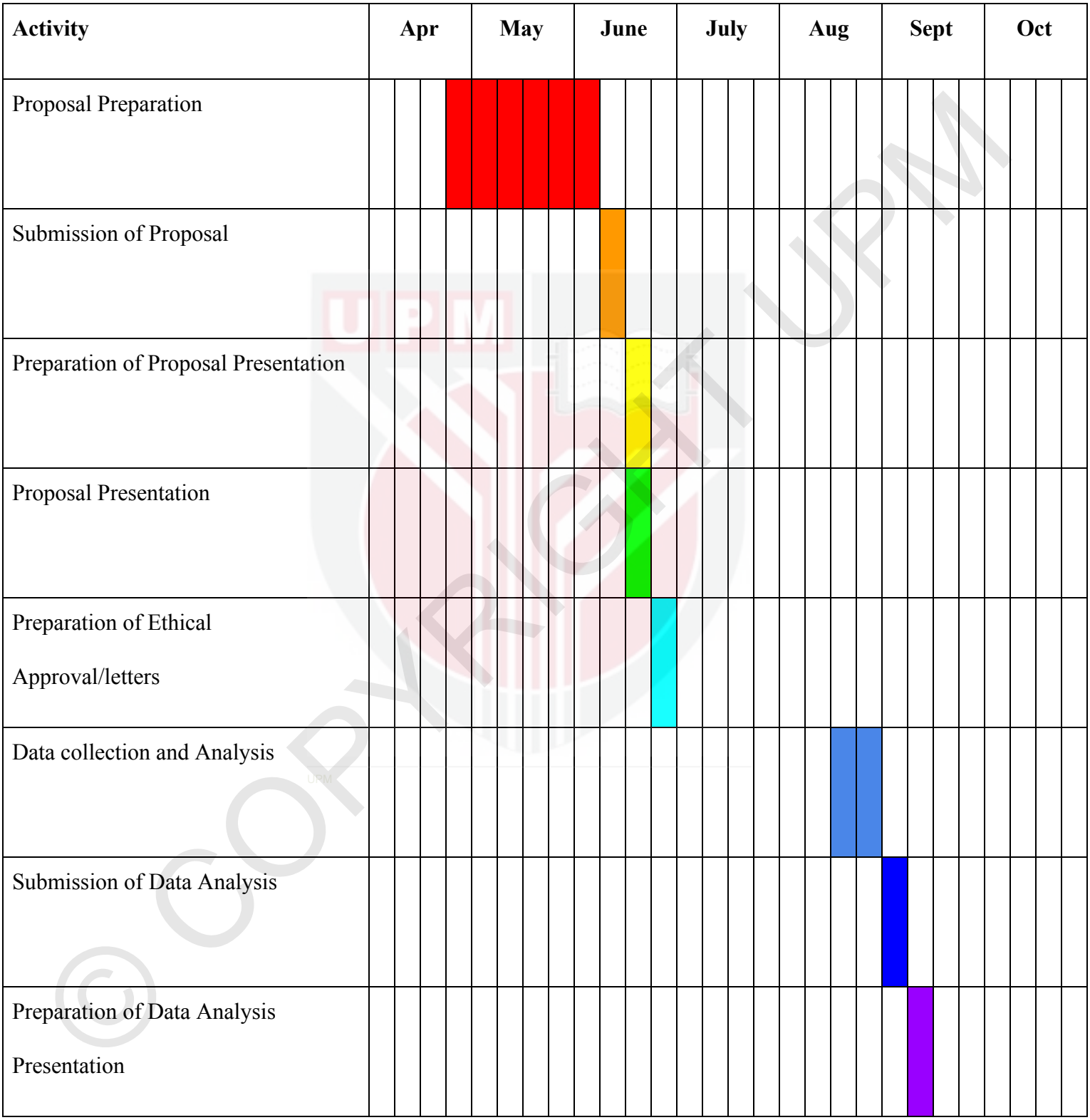
Appendix 5: Gantt Chart



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Data Analysis and Presentation																											
Report Writing and Poster Preparation																											
Submission of Final Reports and Scientific Article																											
Preparation of Final Presentation and Poster Competition																											
Final Presentation																											
Correction of Final Report and Scientific Article																											
Submission of Log Book and Final Reports																											

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Appendix 6: Dummy Table

Section A: Sociodemographic Factors

No.	Sociodemographic Factors	Categories	N	%
1.	**Gender**	**Male**		
		Female		
2.	**Age(years)**	**Less than 20**		
		More than 20		
3.	**Ethnic**	**Malay**		
		Chinese		
		Indian		
		Others		
4.	**Religion**	**Islam**		
		Christian		
		Hindu		
		Buddha		
		Others		
5.	**Year of Study**	**Year 1**		
		Year 2		
		Year 3		
		Year 4		

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Section C: Global Physical Activity Questionnaire(GPAQ)

No		Categories	N	%
1.	**Level of physical activity(MET)**	**Inactive(<600 met- minutes)**		
		Active(600-1200 met- minutes)		
		Highly active(>1200 met-minutes)		

Section D: Body Mass Index(BMI)

No.	Health status index	Categories	N	%
1.	BMI (kg/ m^2)	< 18.5 (underweight)		
		18.5-24.9 (normal)		
		25-29.9(overweight)		

Section E: Perceived Stress Scale(PSS)

Items	Ordinal Scores	N	%
Item 1	1		
	2		
	3		
	4		
	5		
Item 2	1		
	2		

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	3		
	4		
	5		
Item 3	1		
	2		
	3		
	4		
	5		
Item 4	1		
	2		
	3		
	4		
	5		
Item 5	1		
	2		
	3		
	4		
	5		
Item 6	1		
	2		
	3		
	4		
	5		
Item 7	1		
	2		

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	3		
	4		
	5		
Item 8	1		
	2		
	3		
	4		
	5		
Item 9	1		
	2		
	3		
	4		
	5		
Item 10	1		
	2		
	3		
	4		
	5		

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