UNIVERSITI PUTRA MALAYSIA

KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING CARDIOVASCULAR DISEASESS AND ITS RISK FACTORS AMONG MALE UNDERGRADUATE STUDENTS WITH NON-MEDICAL AND HEALTH SCIENCE BACKGROUND IN UNIVERSITI PUTRA MALAYSIA

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ABSTRACT

KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING RISK FACTORS FOR CARDIOVASCULAR DISEASE AMONG MALE UNDERGRADUATE STUDENTS WITH NON-MEDICAL AND HEALTH SCIENCE BACKGROUND IN UNIVERSITI PUTRA MALAYSIA

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Introduction: Cardiovascular diseases have been constantly being the leading causes of death in Malaysia. Even though older population is more susceptible towards cardiovascular disease, there is also high chances for the younger generation to get cardiovascular diseases if many of them is still not aware of the risk factors of cardiovascular disease especially male population. This study is conducted to identify the level of knowledge, attitude and practice regarding cardiovascular disease and its risk factors among male undergraduate students with non-medical and health science background. **Objective:** To determine the level of knowledge, attitude, and practice regarding risk factors of cardiovascular disease among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia. **Methods:** This study uses Simple Random and Stratified Random Sampling as the sampling method. A total of 169 male undergraduate students with non-medical and health science background from 4 chosen faculty participated in this research study. This research study used a self-administered questionnaire adapted from previous study about knowledge, attitude, and practice regarding risk factors of cardiovascular diseases which measure the level of knowledge, attitude, and practice regarding cardiovascular diseases and its risk factors (Mardiah Mahada, Nor Azlina, Nor Iza & Mainul Haque, 2016). SPSS 20 was used for data entry and analysis. **Results:** Overall there are 181 male respondents that involved in this study. 99.4% and 81.2% of the respondents showed good knowledge regarding cardiovascular diseases and its preventive measure, and high level of attitude regarding cardiovascular diseases while 85.6% showed intermediate levels of practice regarding cardiovascular diseases and its risk factor. **Conclusion:** This study showed the male undergraduates' students' levels of knowledge, attitude, and practice regarding cardiovascular disease and its risk factor serve as the baseline data for university's authorities to improve more health education and activities related to avoid the risk factors of cardiovascular diseases.

Keywords: Knowledge, Attitude and Practice, Cardiovascular Disease and its Risk Factors, University Students

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CHAPTER 1: INTRODUCTION

1.1 Background

According to WHO (2018), cardiovascular diseases had been identified as the number one cause of death where about 17.9 billion people died from cardiovascular diseases globally and annually. Out of these cardiovascular diseases' cases, there are about 31 percent death in global where 85 percent of them died from heart attack and stroke. National Health and Morbidity Survey in Malaysia (2019) stated that cardiovascular diseases contributed to 34.8 percent of deaths in Malaysia.

Furthermore, cardiovascular diseases are not only causing death on the spot but there will be disability-adjusted life year due to cardiovascular diseases. A report from the impact of noncommunicable diseases and their risk factors on Malaysia's gross domestic product stated 63.2 percent of males and 36.8 percent females from a total of 1 397 311 Malaysians suffered from disability-adjusted life year due to cardiovascular diseases in 2017 (Ministry of Health Malaysia, 2020). Therefore, cardiovascular diseases cases found to be more in males than females.

Cardiovascular diseases' modifiable risk factors that lead to cardiovascular diseases which were identified by National Health and Morbidity Survey for 2019 are poor diet management, lack of physical activity, use of tobacco and excessive consumption of alcohol where it will give effect to blood pressure, blood glucose, blood lipids where

these are known as major risks for cardiovascular diseases will then lead to developing complications related to cardiovascular diseases (Ministry of Health Malaysia, 2020). There are also non modifiable risk factors that will lead to cardiovascular diseases such as social, economic, and cultural change, population, poverty, stress, hereditary factor, and population ageing (World Health Organization,2017). A study by Mohammadnezhad, Mangum, May, Lucas, and Ailson (2016) showed that the main non-modifiable risk factor of cardiovascular diseases among Pacific Asian countries is age.

A study in Malaysia found that young people are having an increasing in cardiovascular diseases and its risk factor in Malaysia and many developing countries as it has become a crucial attention since the urbanization constancy. The same study also stated also stated that it is critical to assess knowledge, attitude, and practice level on young people such as the university students regarding cardiovascular diseases and its risk factors (Mardhiah Mahada, Nor Azlina, Nor Iza, & Mainul Haque, 2016). Therefore, another study done in the same country where the researchers of the study concluded that knowing the relationship between knowledge, attitude and practice which resulted positive will help the physicians to educate and encourage the community regarding cardiovascular diseases and assists people who want to change their way of life (Rosediani, Ranimah & Harmy, 2012).

1.2 Problem Statement

Statistics on Cause of Death in Malaysia in 2018 stated that Ischemic Heart Disease (IHD) remained as the principal cause of death and being the highest percent in the principal cause of death in Malaysia which is 13.9 percent in 2017 and increase to 15.6 percent in 2018 (Ministry of Health Malaysia, 2019). There are 18 267 patients suffering from IHD which consists of 12 510 male patients and 5 757 female patients where male patients are twice than female patients (Ministry of Health, 2017).

A study involving outpatient clinic in Pahang stated that both the knowledge and attitude have no influence towards practice regarding cardiovascular diseases and its risk factors as the practice among them is still not at optimum level even though they have high score in knowledge and attitude (Nursyafiza, Nor Azlina & Mainul Haque, 2018). A similar study has been conducted among women in Kelantan stated that their population study showed average knowledge, attitude, and practice since they have low education levels (Rosediani, Ranimah & Harmy, 2012). Finding from a study among public university student showed that there is no significant difference in knowledge regarding risk factors between male and female. However, this finding may be bias as the respondents came from Faculty of Medicine, Pharmacy, Dentistry, Nursing, Allied Health Sciences and Science because their level of knowledge on cardiovascular diseases is high (Mardhiah Mahada, Nor Azlina, Nor Iza, & Mainul Haque, 2016). Therefore, a study is important to be carry out among non-medical and health science background students. From the same study, the researchers have concluded that there is

no correlation of knowledge towards attitude and practice regarding cardiovascular diseases and its risk factor.

Hence, these previous studies could be the baseline on level of knowledge regarding cardiovascular diseases and its risk factors, but it is remained unknown whether they have great awareness and practices regarding risk factors that could lead to cardiovascular diseases. To the knowledge of the author, there is not many studies conducted in local setting, so this study is being proposed.

1.3 Significant of The Study

This finding of this study will help in having better understanding in student's level of knowledge, attitude and practice regarding cardiovascular diseases and its risk factors. Then, the finding of the study may be used by the higher authorities and managements to find the solution to increase the knowledge and having good attitude regarding cardiovascular diseases that can contribute to reducing the risks of getting cardiovascular diseases. This finding also may help the university managements in planning interventions to encourage healthier practice regarding cardiovascular diseases and its risk factors include increasing physical activity and having proper diet at young age.

1.4 Research Objectives

1.4.1 General Objectives

To determine the level of knowledge, attitude, and practice regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia.

1.4.2 Specific Objectives and Research Questions

Specific Objectives	Research Questions
i. To determine the level of knowledge regarding cardiovascular diseases and its preventive measures among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia.	i. What is the level of knowledge regarding cardiovascular diseases and its preventive measures among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia?
ii. To determine the level of attitude regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia.	ii. What is the level of attitude regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia?
iii. To determine the level of practice regarding cardiovascular diseases	iii. What is the level of practice regarding cardiovascular

and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia.	diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia?
iv. To identify the relationship between knowledge and practice regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia.	iv. What is the relationship between knowledge and practice regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia?
v. To identify relationship between attitude and practice regarding cardiovascular diseases and its risk factors among male	v. What is the relationship between attitude and practice regarding cardiovascular diseases and its risk factors among male undergraduate

	undergraduate students with non-medical and health science background in Universiti Putra Malaysia.		students with non-medical and health science background in Universiti Putra Malaysia?
vi.	To identify association between sociodemographic characteristics and level of knowledge, attitude, and practice regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia.	vi.	To identify association between sociodemographic data and level of knowledge, attitude, and practice regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia?

Table 1: Specific Objectives

1.5 Research Hypothesis

Knowledge and attitude do not influence the practices regarding cardiovascular diseases and its risk factors.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

In this chapter, literature review will be started by showing the prevalence and incidences of cardiovascular diseases and its risk factors following with knowledge, attitude and practices regarding cardiovascular diseases and its risk factors, relationship between knowledge, attitude and practice regarding cardiovascular diseases and its risk factors and association of sociodemographic background with knowledge, attitude and practice regarding cardiovascular diseases and its risk factors.

2.2 Prevalence and Incidences of Cardiovascular Diseases

According to World Health Organization, cardiovascular diseases have taken place in low- and middle-income countries by causing death more than 75 percent in those countries. There were about 31 percent people died globally which takes around 17.9 million people. Heart disease is the leading cause of death and every 36 seconds, there will be one person dies from cardiovascular diseases in United States (Centres for Disease Control and Prevention, 2020). As for another cardiovascular disease which is the coronary artery disease killed 365,914 people in 2017 and for the adults less than 65 years old, estimated 2 in 10 people will died because of this type of cardiovascular disease.

National Health and Morbidity Survey in Malaysia (2019) stated cardiovascular diseases contributed to 34.8 percent of deaths in Malaysia (Institute for Public Health (IPH) Ministry of Health Malaysia. 2020). Cardiovascular diseases will continue to be a great burden in Malaysia where the prevalence of obesity was 11.4 percent at that time (Yunus, Sherina. Nor Afiah, Rampal & Tiew, 2014). However, there is a decreasing in percentage of cases in ischemic heart disease where from 15.9 percent to 15.0 percent from 2018 to 2019 respectively, but it is remained as the principal cause of death in Malaysia where this disease also has high percentage in males than in women where in total of 16 325 people, 11 330 (69.4 percent) of them are males and another 4995 (30.6 percent) are from females (Ministry of Health Malaysia, 2020).

2.3 Knowledge Regarding Cardiovascular diseases and Its Preventive Measures

Finding in a study done shows a good knowledge regarding cardiovascular diseases and its risk factors as they are aware of cardiovascular diseases and understand the risk factors of cardiovascular disease (Nursyafiza, Nor Azlina & Mainul Haque, 2018). A previous study done among students in a public university where about 68 percent gave correct answer regarding conditions related to cardiovascular diseases as most of them are students coming from faculty that medicine and health science and dentistry that may have bigger chance of having basic knowledge regarding cardiovascular disease. (Mardhiah Mahada, Nor Azlina, Nor Iza & Mainul Haque, 2016). A study in rural community in Pakistan showed that more than half of the population study have good knowledge regarding risk factors of cardiovascular diseases (Sumaira Ejaz, Muhammad Afzal, Muhammad Hussain, Hajra Sarwar & Syed Amir Gilani, 2018).

However, a previous study in United States reported that the participants were not aware that cardiovascular diseases are a number one cause of deaths to women in that country (Bairey Merz et. al, 2017). Meanwhile, a study in Tanzania concluded that the respondents there which consists of young and middle-aged adults showed low level of knowledge regarding risk factors regarding cardiovascular diseases even though 65.7 percent of respondents know and heard about cardiovascular diseases (Muhihi et. al, 2020).

Finding of a study conducted among women in Kelantan, Malaysia showed that 55.6 percent of the respondents showed good knowledge regarding cardiovascular

diseases. The highest percentage in the items of knowledge regarding risk factors of cardiovascular diseases is 87.1 percent that answered smoking but is still undeniable that many of the respondents stated that they did not aware regarding cardiovascular diseases being the main cause of death in Malaysia where it was low than 40 percent (Rosediani, Ranimah & Harmy, 2012). Another study by Bairey Merz et. al (2017) showed that majority of the respondents which were women stated that 76 percent of them were not aware regarding cardiovascular diseases but 86 percent of them stated that they acknowledge the differences of symptoms of cardiovascular diseases between men and women.

2.4 Attitude Regarding Cardiovascular diseases and Its Risk Factors

According to a previous study done by Nursyafiza, Nor Azlina & Mainul Haque (2018) showed positive attitude regarding risk factors of cardiovascular diseases. Most of the subjects had positive attitude towards prefer walking than taking any other means of transportation, eat fruits and vegetables, and avoid carbonated drinks. However, in that same research study, only 52 percent respondents agreed on avoiding fast food and lazing around. In addition, study in Tehran also showed that most of the respondents which about 70 percent of them have a very positive attitude regarding risk factor of cardiovascular diseases (Koohi & Khalili, 2020). However, a previous study done at Iran by Mazloomy et. al (2014) reported that respondents that have family history with cardiovascular diseases history shows better attitude regarding risk factors of cardiovascular diseases than those who did not. Bairey Merz et. al (2017) also stated that the respondents which around 57 percent were aware that they must do many things to take care of their heart condition but sometimes they said that it was very overwhelming for them to manage this issue.

Furthermore, a study done among adults in rural community in Lahore, Pakistan by Sumaira Ejaz, Muhammad Afzal, Muhammad Hussain, Hajra Sarwar & Syed Amir Gilani (2018) revealed that only 28 percent of them agree that exercise could preserve a healthy lifestyle while only 11 percent of them stated that they disagree with eating food super late at night is good which showed that many of them agree with eating late at night is good thus overall result for the attitude regarding cardiovascular diseases was stated as poor and negative. On the other hand, a study done among women in Kelantan

stated that they get a good result regarding the population study's attitude where they also stated that their respondents are aware of leading a healthy lifestyle that had been promoted in the mass media on that time where it focuses on good eating behaviour and exercise regularly. However, in the same study in Kelantan, they also stated that there were 20 percent of the respondents that are a smoker did not agree to stop smoking but 70 percent of them showed good attitude to encourage other people to stop smoking (Rosediani, Ranimah & Harmy, 2012).

2.5 Practice Regarding Cardiovascular diseases and Its Risk Factors

According to the study among outpatient respondents reported that more than half are practicing good behaviour and practices regarding risk factors of cardiovascular diseases where they did more physical activities and eat healthy foods, only 11 percent of them practicing consuming fast food every day and half of the population seldomly consume fast food (Nursyafiza, Nor Azlina & Mainul Haque, 2018). However, a study involving public university students, reported that even though they have high knowledge on cardiovascular diseases and good attitude response, they did not practice their knowledge well as only 13.8 percent of the students willing to spend their free time with exercise (Mardhiah Mahada, Nor Azlina, Nor Iza & Mainul Haque, 2016). However, there were 51.6 percent of the respondents on the same study claimed that they walked for more than 10 minutes to get to and from places as their good practices regarding risk factors of cardiovascular diseases.

A study done in Pakistan among adults in rural community had a very poor practices regarding cardiovascular diseases where only 5 percent and 24 percent do daily exercise for 10 minutes and never eat fast food respectively (Sumaira Ejaz, Muhammad Afzal, Muhammad Hussain, Hajra Sarwar & Syed Amir Gilani, 2018). Furthermore, there is a study done in Malaysia also stated that only 50 percent women showed the practice of lowering the risk of cardiovascular diseases however it can still be considered as good towards a healthy lifestyle regarding risk factor of cardiovascular diseases. The study finding also commented that at that time there were many health campaigns that focuses on healthy lifestyle through mass media, but all the efforts

seemed not even effective as Ministry of Health also had inadequate certified dietitians and educator nurses in primary healthcare centers (Rosediani, Ranimah & Harmy, 2012).

2.6 Relationship between Knowledge, Attitude and Practice regarding Cardiovascular diseases and Its Risk Factors

A research study done among adults in rural community in Pakistan concluded that there is no association between the knowledge in attitude and practices as majority of the respondents showed high knowledge regarding cardiovascular diseases, but they had pessimist attitude thus led them to had bad practice in preventing cardiovascular diseases (Sumaira Ejaz, Muhammad Afzal, Muhammad Hussain, Hajra Sarwar & Syed Amir Gilani, 2018). This finding also supported by Mardhiah Mahada, Nor Azlina, Nor Iza, and Mainul Haque on 2016 research study done among public university students in Malaysia where there is no correlation between knowledge and attitude and no correlation between knowledge and practices.

However, a study done among women in Malaysia showed that majority of the respondents have least knowledge regarding cardiovascular diseases and its risk factors, but they showed a good attitude regarding ways to prevent cardiovascular diseases and its risk factors even though only 50 percent of the respondents indicating good practices to prevent cardiovascular diseases and minimizing its modifiable risk factors where that 50 percent is considered not optimal by the researchers. There was no notable relationship between knowledge and attitude as they have low knowledge regarding cardiovascular diseases and its risk factors, but they showed best attitude regarding cardiovascular diseases. Other than that, 50 percent of the participants of the research

study still showed best practice even though they have poor knowledge regarding cardiovascular diseases and its risk factors (Rosediani, Ranimah & Harmy, 2012).

A study done in Eastern Nepal showed that there is also no correlation between knowledge and attitude as the respondents in the study showed average knowledge in cardiovascular diseases and its risk factors but they have good attitude regarding cardiovascular diseases and its risk factors while practices among them has no definite relation with their knowledge as the respondents have mixed practices such as they will not seek medical attention from physician if they are sick instead they will visit their traditional healers or drink alcohol even though consuming alcohol is one of the risk factors of cardiovascular diseases(Shrestha et. al, 2020). A similar study done in the same country among urban community showed that poor knowledge, attitude and practice regarding cardiovascular diseases and its risk factors and it could be said that there is no relation between knowledge with attitudes and practices as there is also patients of cardiovascular diseases but still showed poor attitude and practices towards cardiovascular diseases and its risk factors (Vaidya, Aryal & Krettek, 2013).

A study in Iran among adults attending healthcare centres showed significant relationship between knowledge and attitude but not between knowledge and practices regarding cardiovascular and its risk factors (Koohi & Khalili, 2020). Another study in the same country among women who works as health services' staffs showed a significant relationship between knowledge and attitude regarding cardiovascular

diseases however there was no relationship between knowledge and practice (Salahshoori et. al, 2017).

In addition, there was a correlation between knowledge with attitude and practice in a study done by Mazloomy et. al (2013) among women that were referred to the health centres where they showed that having a high knowledge regarding cardiovascular diseases and its risk factors led to having good attitudes and practices. On the other hand, a study done among the patients of metabolic syndrome in a teaching hospital in India showed that there is no correlation between knowledge and attitude as only 30 percent of the respondents have high knowledge regarding cardiovascular diseases and its risk factors but most of the respondents showed best attitude inn reducing risk factors of cardiovascular diseases while the respondents have poor practices regarding cardiovascular and its risk factors (Verma, Mehta, Mehta & Patyal, 2019).

2.7 Association Between Sociodemographic Background and Knowledge, Attitude and Practice regarding Cardiovascular diseases and Its Risk Factors

A study conducted among patients attending outpatient clinics in Kuantan reported that there was a significant difference between races and gender in level of knowledge regarding risk factors of cardiovascular diseases but there was no significant difference between different in levels of academic in knowledge regarding risk factors of cardiovascular diseases. In the same study reported that there are no significant differences in scores for attitude and practice section regarding cardiovascular diseases and its risk factors between varies genders, races, and level of educations. (Nursyafiza, Nor Azlina & Mainul Haque, 2018). However, another study done in the same country among public university student in Malaysia reported that there is no significant difference in knowledge regarding risk factors of cardiovascular diseases in both gender of males and females and the different years of study while there is a significant difference was found in knowledge regarding risk factors of cardiovascular diseases between the different faculties. The same study also found a significant difference between gender in attitude and practice where females have better attitude and practice than males regarding cardiovascular diseases and its risk factors. However, there was no statistical difference between the scores of total attitude and practice between the different faculties or between the different years of study. (Mardhiah, Mahada, Nor Azlina, Nor Iza & Mainul Haque, 2016). Another study that was also done in Malaysia reported that there are about half of the participants that came from low levels of income and education had average levels in knowledge, attitude and practice regarding cardiovascular diseases and its risk factors (Ranimah, Rosediani, & Harmy, 2012).

A study in the United States among women revealed that women in minorities ethnic, low income and education have low awareness regarding heart diseases. In that same study, younger and middle-aged participants showed low level of knowledge than older participants regarding cardiovascular diseases in women (Bairey Merz et. al, 2017). However, a study in Nepal among urban community showed different results where that participant who are younger have high knowledge regarding cardiovascular diseases than older participants. In the same study also reported that participants from Brahmin have satisfactory level of knowledge than Newer and Chhetri and other ethnicity where these ethnicities showed low knowledge regarding cardiovascular diseases. Furthermore, they also reported that respondents that went to high school and working in government and non-government sectors also showed that they have better knowledge than those who had low level of education and working in other sector than government and non-government .In addition, the researcher of the same study also reported that different gender, age, ethnicity and level of education does not have any significant difference when they were asked about warning sign regarding cardiovascular disease. There were also no significant differences between genders and knowledge, attitude, and practice. However, only level of attitude has no significant relationship towards age, ethnicity, and level of education. On the other hand, there was a significant difference between practice and age, ethnicity, and level of education. Participants age below than 35 years old have good practice than participants age more than 45 years old. Regarding ethnicity, Brahmin had good practices than another ethnicity in Nepal. Moreover, participants with no formal education had high knowledge than participants with high education levels but in terms of practice, the

participants with no formal education just had low levels in practice (Vaidya, Aryal & Krettek, 2013).

A study done in Eastern Nepal among municipal citizen which resulted most of the respondents had secondary education and had better knowledge about the risk factors of cardiovascular diseases such as and their knowledge regarding cardiovascular diseases increased as there was an increase in prevalence of cardiovascular diseases. On the other hand, in the same study also showed that the elder people still lack knowledge even though they are having bigger risk of having cardiovascular diseases. The study also showed that men in the population study have better knowledge than women as women in their population were lack of education. Furthermore, in the same study where most of the respondents were from men, have positive attitude regarding cardiovascular diseases and its risk factors and practice good behaviour if they have cardiovascular diseases. In addition, they also stated that they will get help from the physicians if they have heart disease and listened to physician's advice regarding their health status (Shrestha et. al, 2020). However, a study in Iran contradicts with the study in Eastern Nepal where the participants in Iran aged more than 40 years old knew more about cardiovascular diseases than respondents whose aged less than 40 years and it is reported that there is a significant association between age and knowledge regarding cardiovascular diseases and its risk factors. Furthermore, the study also revealed that their participants that have high education levels have great knowledge regarding cardiovascular diseases and its risk factors compared to those who have intermediate or low level of education. Nonetheless, in this same study, they did not find any significant

association between gender and level of knowledge among respondents, association between level of knowledge and family history of having any cardiovascular diseases and association between having high knowledge and having cardiovascular diseases compared to those who did not. The study also showed that respondents with high level of education will have high scores in attitude, nutrition, and behavioural of smoking than respondents with intermediate to low level of education. However, their attitude was significantly better in comparison to those who did not have such a family history. Regarding to practice, their study found that respondents with family history of cardiovascular diseases showed that they do not practice better behaviour and they did not score better in practices regarding cardiovascular diseases and its risk factors than respondents who did not have family history of having cardiovascular diseases. Furthermore, participants who have cardiovascular diseases and its risk diseases that could lead to cardiovascular diseases did not have a high knowledge, attitude, and practice in comparison to those who did not. (Koohi & Khalili, 2020).

Another study done among adults more than 18 years old in Cameroon showed that women have good knowledge compared to men regarding cardiovascular diseases and its risk factors and important signs of heart attack. Despite that, respondents who have high education level and income, family history of getting cardiovascular diseases and who had been involved as a smoker before having moderate to good knowledge regarding cardiovascular diseases (Aminde et. al, 2017). A similar study done among women referred to health centres in Iran showed that women also have high knowledge regarding cardiovascular diseases and its risk factors, but the difference was the women

had a history of family members regarding cardiovascular diseases have high knowledge regarding cardiovascular diseases compared to those who are not having family history regarding cardiovascular diseases. Furthermore, there is also a significant difference between level of knowledge regarding cardiovascular diseases and education level. In addition, participants have better attitude are respondents that had family with history of risk factors of cardiovascular diseases than the one with no such family history regarding cardiovascular diseases and its risk factors (Mazloomy et. al, 2013).

There is another study done among metabolic syndrome patients in a teaching hospital in India that showed respondents with small waist measurement and good fasting sugar level have high knowledge regarding cardiovascular diseases and its risk factors even though no significant association being identified. In the same study, the researchers managed to find association between gender with level of knowledge and attitude where male have higher knowledge and attitude regarding cardiovascular diseases than women. Therefore, having high knowledge and attitude and practice regarding cardiovascular diseases also associated with having high level of education and came from middle and upper class of socioeconomic compared to the lower class, but they found that the finding is insignificant. The study also stated that respondents in young age which is below 40 years old practice better lifestyle than old age respondents (Verma, Mehta, Mehta & Patyal, 2019). They also found that male have good practices compare to female where the difference between both genders was significant (Verma, Mehta, Mehta & Patyal, 2019). However, they also reported respondents with no known

level of education showed that they had poor practices of preventing cardiovascular diseases and its risk factors (Verma, Mehta, Mehta & Patyal, 2019).

A study done among public in Kuwait found that the respondents with high level of education, healthy eating, and having a family history of cardiovascular diseases have high knowledge regarding cardiovascular diseases. In the same study, knowledge regarding cardiovascular diseases were high in female compared to males and respondents aged 50-59 years old have high knowledge than other age group. It also reported that respondent's data such as monthly income, status of smoking, weight and exercise's frequency were not associated significantly with the knowledge of cardiovascular diseases. Furthermore, the study also showed that even though the respondents are having cardiovascular diseases or any cardiovascular diseases risk factors, they still have low level of knowledge regarding cardiovascular diseases and its risk factors (Awad & Al-Nafisi, 2014).

2.8 Conceptual Framework

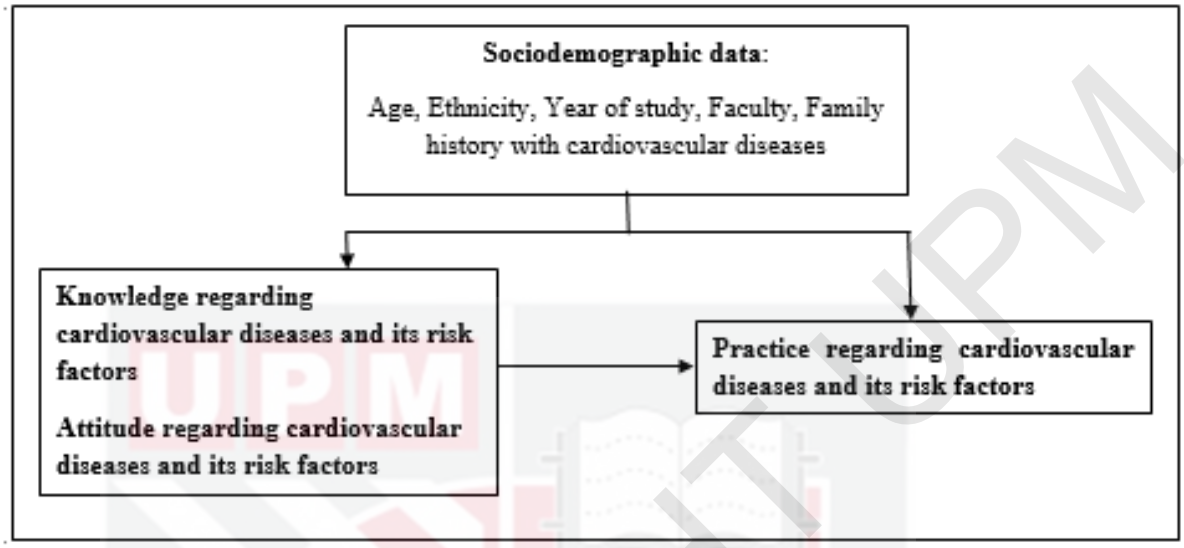


Figure 1: Conceptual Framework

From this figure, the independent variable is the knowledge and attitude regarding cardiovascular diseases and its risk factors while the dependent variable is the practice regarding cardiovascular diseases and its risk factors. This framework being created as to show the idea of this research where to observe whether sociodemographic data associate with both independent and dependent variable and whether the dependent variable is influenced by the independent variable.

CHAPTER 3: METHODOLOGY

3.1 Introduction

This chapter explains the method used to conduct this research. This chapter included the research study design, study setting, population, and sampling with its inclusion and exclusion criteria sample and sample size, data collection method and instruments used along with its reliability and validity, data collection process and analysis. Other than that, ethical consideration also being explained in this chapter. Gantt chart also being included in this chapter.

3.2 Study Design

The cross-sectional design was being used in this study to determine the level of knowledge, attitude, and practice regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia. The strength of cross-sectional study according to Wang and Cheng (2020) are there will be no difficulty in ethical issue, multiple results and exposures could be studied and data can be collected at one time. However, Wang and Cheng (2020) also stated the weakness of the cross-sectional study where this study will never be able to measure the incidence of the disease in the study and causal inference will be difficult to make. This study design was being used in this study because data collection had been collected at one point of time only. This design selected because it was relatively quick, easy to conduct and suitable to be conducted as the researcher only have limited time to complete the study. This design of research study also needs no prospective or retrospective follow-up.

3.3 Study Setting

This study was conducted at Universiti Putra Malaysia involving student from various faculty, course, and year of study. This study was conducted among undergraduates from Universiti Putra Malaysia as its aim to develop awareness among younger population and it is focused only on male population as male are known to be susceptible to cardiovascular diseases then female.

The faculties that had been chose were Faculty of Engineering, Faculty of Human Ecology, Faculty of Modern Languages and Communication, Faculty of Forestry except Faculty of Medicine and Health Science as to avoid bias where students from Faculty of Medicine and Health Science usually know better regarding cardiovascular diseases shown by previous study where students from medical and health science background have high knowledge and attitude regarding cardiovascular diseases.

3.4 Study Population

The target population for this study was male undergraduate with non-medical and health science background in Universiti Putra Malaysia students regardless their ethnicity and year of study.

There were around 1984 male undergraduate students in Universiti Putra Malaysia at Serdang from four faculties which were 945 male students from Faculty of Engineering, 200 male students from Faculty of Human Ecology,509 male students from Faculty of Modern Languages and Communication and 330 male students from Faculty of Forestry.

3.5 Inclusion & Exclusion Criteria of Sample

Inclusion Criteria	Exclusion Criteria
i. Voluntary participant ii. Male undergraduate's students iii. Malaysia citizen	i. Suffering from Cardiovascular Diseases (i.e.: coronary heart disease, stroke, transient ischemic attack, peripheral arterial disease, and aortic disease) ii. Non-Malaysian citizen or Foreigner iii. Undergraduate students from Faculty of Medicine and Health Science iv. Post-graduate students v. Foundation students vi. Students on defer their study and on long medical leave

Table 2: Inclusion and Exclusion Criteria of Sample

3.6 Sample Size

The sample size was calculated by using two sample proportions generated by Lwanga and Lemeshow in 1991 which the proportions needed will be obtained from previous study. In studies where the plan is to estimate the difference in proportions between two independent populations (i.e., to estimate the risk difference), the formula for determining the sample sizes required in each comparison group is derived from (https://select-statistics.co.uk/calculators/sample-size-calculator-two-proportions/) are as below:

After calculation done by using two sample proportions calculator, the estimated number of participants needed in this study was 164 respondents. Formula sample size:

$$\mathbf{n = ((Z_{\alpha/2}+Z_{\beta})^2)\ (p_1(1-p_1) + p_2(1-p_2))}$$

Where:

n = Required sample size in each group (i.e., =1,2)

$\mathbf{Z_{\alpha/2}}$ = value from the standard normal distribution reflecting the confidence level that will be used (e.g., for a confidence level of 95%, α is 0.05 and the value is 1.96)

$\mathbf{Z_{\beta}}$ = value from the standard normal distribution at β (e.g., for a power of 80%, β is 0.2 and the value is 0.842

p1 & p2 = proportions of successes in each comparison group.

Firstly, the sample size for testing two population proportions which the p1= 84% (0.84) was the proportion of students with medical and health science background which have good score in Knowledge Regarding Cardiovascular Diseases and its Risk Factors from Mardhiah Mahada, Nor Azlina, Nor Iza & Mainul Haque (2016) while p2=55.6% (0.556) was the proportion of public with non-medical and health science background which have good score in in Knowledge Regarding Cardiovascular Diseases and its Risk Factors from Rosediani, Ranimah & Harmy (2012). Sample size for was calculated as below:

$$\mathbf{n = ((Z_{\alpha/2} + Z_{\beta})^2) (p_1(1-p_1) + p_2(1-p_2)) / (p_1-p_2)^2}$$

$n = ((1.96 + 0.842)^2) (0.84(1-0.84) + 0.556(1-0.556)) / (0.84-0.556)^2$

$n = 37.1$

n= 38

Adjusted with 10% non-response rate=10% of 38=3.8. Hence, the total sample size needed is 41.8 which rounded off as **42**.

Secondly, the sample size for testing two population proportions which the p1= 66.7% (0.667) is the proportion of students with medical and health science background which have good score in Practice Regarding Cardiovascular Diseases and its Risk Factors from Mardhiah Mahada, Nor Azlina, Nor Iza & Mainul Haque (2016) while p2=51.1% (0.511) is the proportion of public with non-medical and health science background which have good score in in Practice Regarding Cardiovascular Diseases and its Risk Factors from Rosediani, Ranimah & Harmy (2012). Sample size for is calculated as below:

$$\mathbf{n = ((Z_{\alpha/2} + Z_{\beta})^2) (p_1(1-p_1) + p_2(1-p_2)) / (p_1-p_2)^2}$$

$n = ((1.96 + 0.842)^2) (0.667(1-0.667) + 0.511(1-0.511)) / (0.667-0.511)^2$

$n = 152.3$

n= 153

Adjusted with 10% non-response rate=10% of 153=15.3. Hence, the total sample size needed is 168.3 which rounded off as **169**.

Highest calculation will take to cover the population among students with the chosen faculty in Universiti Putra Malaysia. Therefore, the sample size needed for this study is **169**.

Then to get the sample size for each faculty, first, the population size for each faculty will be divided by the size of entire population then multiply by the size of entire sample. Stratified random sampling formula (Neyman, 1934):

nh = (Nh / N) * n

where:

nh= Sample size for hth stratum

Nh= Population size for hth stratum

N = Size of entire population

n = Size of entire sample

After the stratification of the population, the number for the sample needed for each faculty is shown in the following table:

FACULTY	STRATIFICATION OF POPULATION	TOTAL SAMPLE NEEDED
Engineering (n= 945)	(169/1984) x 945 =80.49	80
Forestry (n= 330)	(169/1984) x 330 = 28.11	28
Human Ecology (n= 200)	(169/1984) x 200 =17.04	17
Modern Languages and Communications (n= 509)	(168/1984) x 509 = 43.36	44
TOTAL	168.99	**169**

Table 3: Stratification of respondents needed according to the faculty.

Knowing that the total population of the sample size of the faculty that had been chose which the respondents were male undergraduate students with non-medical and health science background in Universiti Putra Malaysia is 1984 students, if the margin of error is set to 5% and the confidence level set to 95% with response distribution 50%, the minimum recommended sample size is 169 samples. Then, the respondents needed from each faculty were 80, 28, 17 and 44 from Faculty of Engineering, Faculty of Forestry, Faculty of Human Ecology and Faculty of Modern Languages and Communications.

3.7 Study Sampling

This study used probability sampling which was stratified random sampling. However, to choose the faculty involved in the study, simple random sampling had been used. Random draw of YES or NO had been used to choose which faculty in UPM will participate in this research study. Each faculty had 50% of probability to be chosen. Researcher had put two papers of YES and NO in a closed container then the researcher had followed the list of the faculties and say it out aloud. Next, the researcher had drawn whether the faculty get YES paper or NO paper. The faculty that got the YES paper had been included in this research and the faculty that get the NO paper had been excluded from this research. This method was being used to avoid bias and provide equal chances for the faculties to be chosen.

There are 4 faculties that had been getting the YES paper and been included in this research which were Faculty of Engineering, Faculty of Human Ecology, Faculty of Modern Languages and Communication, Faculty of Forestry.

Students from four faculties selected been selected using stratified random sampling. Stratified random sampling method focused on proportionate stratification where each faculty were having the same sampling fraction. This method provides better and equal precision for each respondent from each faculty. The stratified random sampling been conducted by gaining the total number of male students in each chosen faculty with the help of Student Representative for each faculty and using formula “nh =

(Nh / N) *n", the number of respondents needed for each faculty been gained with the same sampling fraction.

For the selection of the total respondents in each stratum from the faculties and departments, the proportionate allocation method in stratified random sampling was used as this method use sampling fraction in each of the strata that is proportional to that of the total population.

3.8 Data Collection Method and Instruments

In this study, the researchers were using self-administered questionnaire. The questionnaire was adapted from previous study about knowledge, attitude, and practice regarding risk factors of cardiovascular diseases (Mardiah Mahada, Nor Azlina, Nor Iza & Mainul Haque, 2012).

There were 4 main sections in the questionnaire which are Section A: Socio-Demographic characteristics which contains 7 items for the participants to provide information about personal questions which is age, year of study, faculty, ethnicity, family history of cardiovascular diseases and type of cardiovascular diseases from family history.

Next was the 17 items in Section B: Knowledge on risk factors of cardiovascular diseases and its preventive measure with questions that focused on the cardiovascular diseases' facts and situation related to cardiovascular diseases where these question items were constructed as close-ended questions with "Yes", "No" and "Don't Know" where "Yes" been scored as 3, "No" been scored as 1 and "Don't Know" been scored as 2. Some items had reverse scoring such as item number 5, 10,11, 12 and 13. To get the final score for knowledge levels, the total scale added had been given by the participants for the listed numbers. The maximum score was 51 and the minimum score was 17. Knowledge been categorized into two category that "GOOD' and "POOR'.

Mean been calculated from total score obtained from participant. Score above mean was categorized “GOOD” and score below mean was categorized as “POOR”.

Section C: Attitude regarding risk factors of cardiovascular diseases where it contained 14 items with five-point Likert scale with five choices ranging from “Strongly Agree” to “Strongly Disagree” items where “Strongly Agree” been scored as 5, “Agree” been scored as 4, “Uncertain” been scored as 3, “Disagree” been scored as 2 and “Strongly Disagree” been scored as 1. Some items had reverse scoring such as item number 6, 8 and 11. To get the final score for attitude levels, the total scale added had been given by the participants for the listed numbers. The maximum score was 70 and the minimum score was 14.

Attitude been categorized into three levels which are “High”, “Intermediate” and “Low” where high scores indicate for positive attitude while low scores indicated for negative attitude regarding cardiovascular and its risk factors. The cut off mean score is 1.33. According to Dehghani, Hayat, Kojuri and Esmi (2015), the three levels are based on mean interval which are “Low” level:1.00-2.33, “Intermediate” level: 2.34-3.67 and “High” level:3.68-5.00 by using the following formula:

$$\frac{\textit{Highest Possible Score} - \textit{Lowest Possible Score}}{\text{Categories}}$$

where:

$$\frac{Highest\ Possible\ Score\ (5) - Lowest\ Possible\ Score(1)}{\text{Categories } (3)}$$

$$= 1.33$$

Attitude Levels	Mean Score
Low	1.00-2.33
Intermediate	2.34-3.67
High	3.68-5.00

Table 4: Levels of Attitude and Practice regarding cardiovascular diseases and its risk factors and Mean Score

Section D: Practice regarding risk factors of cardiovascular diseases. Total questions for this section were 10 items which used the scheme of four answer choices: "Always", "Frequent", "Seldom" and "Never", centred on the practice towards the prevention of cardiovascular diseases risk factors [Always means at all times, Frequent means happening often, Seldom means not often or almost never, Never means not ever or not at any time]. Always" been scored as 1, "Frequent" been scored as 2, "Seldom" been scored as 3 and "Never" been scored as 4. Some items had reverse scoring such as item number 1,2, 3, 4, 5. 6. 8, and 9. To get the final score for practice levels, all the

total scale that had been added given by the participants for the listed numbers. The maximum score is 40 and the minimum score is 10.

Practice been categorized into three levels which are “High”, “Intermediate” and “Low” where high scores indicate for positive attitude and best practice while low scores indicate for negative attitude and poor practice regarding cardiovascular and its risk factors. The cut off mean score is 1.00. According to Dehghani, Hayat, Kojuri and Esmi (2015), the three levels are based on mean interval which are “Low” level:1.00-2.00, “Intermediate” level: 2.01-3.00 and “High” level:3.01-4.00 by using the following formula:

$$\frac{Highest\ Possible\ Score - Lowest\ Possible\ Score}{\text{Categories}}$$

where:

$$\frac{Highest\ Possible\ Score\ (4) - Lowest\ Possible\ Score(1)}{\text{Categories}\ (3)}$$

$$=1.00$$

Practice Levels	Mean Score
Low	1.00-2.00
Intermediate	2.01-3.00
High	3.01-4.00

Table 5: Levels of Practice regarding cardiovascular diseases and its risk factors and Mean Score

3.9 Operational Definition and Conceptual Definition

VARIABLE	CONCEPTUAL DEFINITION	OPERATIONAL DEFINITION
Knowledge	Information and understanding about a subject which a person has, or which all people have (Collins Cobuild Learner's Dictionary, 2020).	In this study, knowledge will be defined an information or understanding about risk factor of cardiovascular diseases. It is measure using 12 items in CVD KAP-29 tools by (Mardhiah Mahada, Nor Azlina, Nor Iza & Mainul Haque, 2012). The items used True, False and Don't know as their scale. The maximum score is 51 and the minimum score is 17. Knowledge will be categorized into two category that are "GOOD' and "POOR'. Mean will be calculated from total score obtained from participant. Score above mean is categorized as "good knowledge" and score below mean is categorized as "poor knowledge".

Attitude	The way a person thinks and feel about it, especially when this shows in the way the person behaves. (Collins English Dictionary, 2020).	In this study, attitude will be defined an action that the respondents should do regarding risk factors of cardiovascular diseases and will be measured by 10 items with five-point Likert scale with five choices ranging from "Strongly Agree" to "Strongly Disagree" items (Mardhiah Mahada, Nor Azlina, Nor Iza & Mainul Haque, 2012). The maximum score is 70 and minimum score is 14. Attitude is categorized into three, "Low", "Intermediate" and "High" (Dehghani, Hayat, Kojuri & Esmi, 2015).
Practice	Doing something regularly to be able to do it better. A practice is one of these periods of doing something (Collins Cobuild Learner's Dictionary, 2020).	In this study, practice will be defined as an action done by respondents towards prevention of cardiovascular diseases and will be measured by 10 items which used the scheme of four answer choices: "Always", "Frequent", "Seldom" and "Never", centred on the practice

		towards the prevention of cardiovascular diseases risk factors [Always means at all times, Frequent means happening often, Seldom means not often or almost never, Never means not ever or not at any time] (Mardhiah Mahada, Nor Azlina, Nor Iza & Mainul Haque, 2012). The maximum score is 40 and minimum score is 10. Practice is categorized into three, "Low", "Intermediate" and "High" (Dehghani, Hayat, Kojuri & Esmi, 2015).
Awareness	Awareness is the knowledge and perception of certain facts (Oxford Learner's Dictionaries, 2020).	This section will be defined as respondent's knowledge and information regarding risk factors of cardiovascular diseases.
Undergraduate	A student at a university	Undergraduate students are the population study in this research

	or college who is studying for his or her first degree (Collins COBUILD Advanced English Dictionary, 2020).	which are from any age, any ethnicity, any years of study, any faculty except undergraduate students from medical and health science faculty

Table 6: Operational Definition and Conceptual Definition

3.10 Data Collection Process

The flow chart below shows the process of data collection for this study:

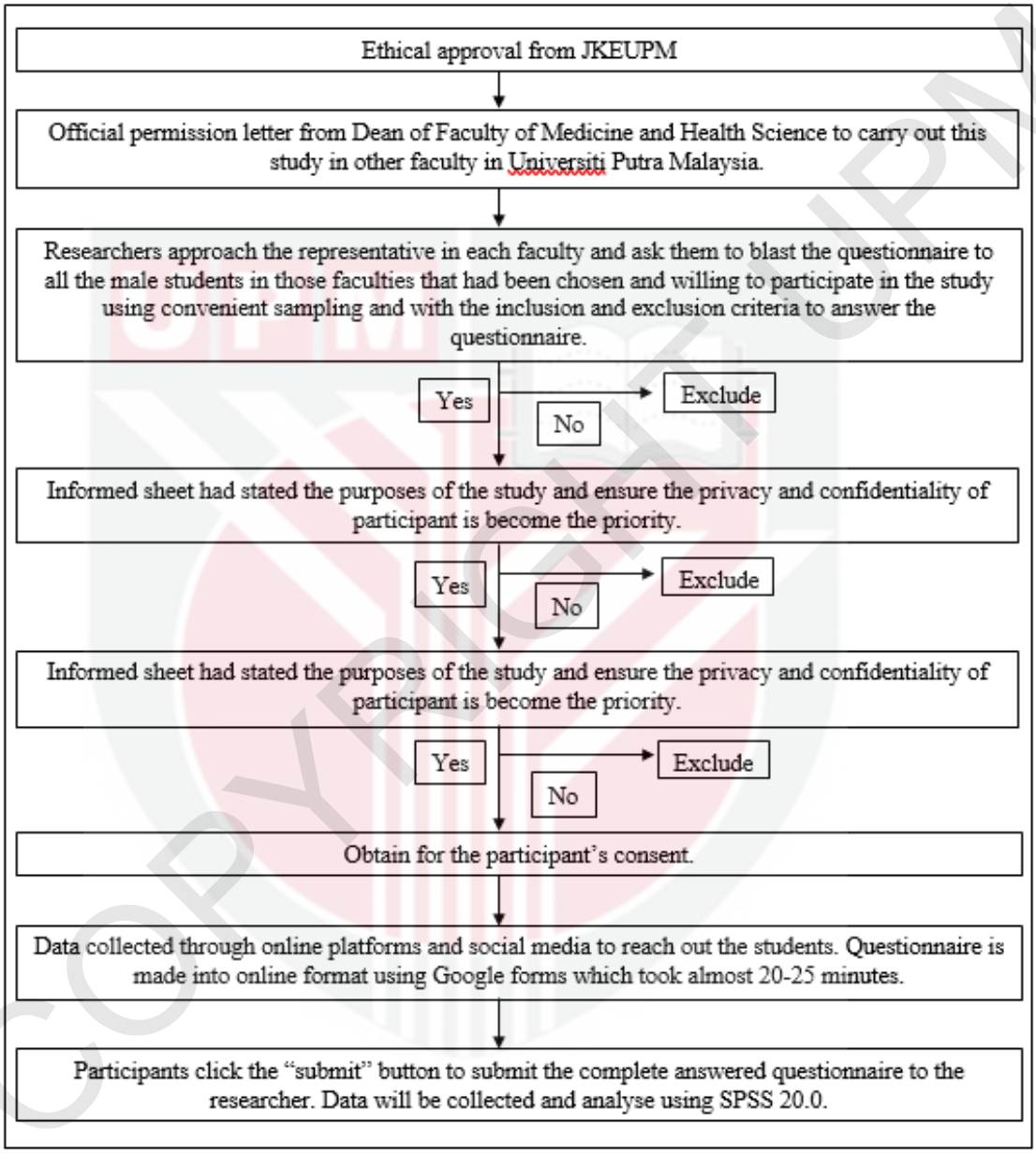


Figure 2: Data Collection Process

Data collection process been started when the researcher obtained the ethical approval from ethic committee of JKEUPM and permission letter from Official permission letter from Dean of Faculty of Medicine and Health Science to carry out this study. Researcher approached representative in each faculty and asked them to help to distribute the questionnaire to all the male students in those faculties that were available and willing to participate in the study.

The participants that had fulfilled the criteria given had been explained about the study. The participants that agreed to be participated in the study had been given information sheet and consent form had been obtained from them. After that, questionnaire had been given to the participant to answer. The questionnaire had been made into online format using Google form. The data for this study been collected through online platforms and social media to easily reach out students from another faculty.

The estimated time allocated for the participants to answer all the questionnaire is around 20-25 minutes. Participants will submit the complete questionnaire in the google form to the researcher. Finally, the data collected been analysed.

3.11 Data Analysis

All the data that had been collected entered computer and analysed using Statistical Package for Social Science (SPSS) version 20.0. Data coded, entered the system, and explored.

Specific Objectives	Variables	Type of Variables	Statistical Measurements
To determine the level of knowledge regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia.	Knowledge regarding risk factors of cardiovascular diseases.	Continuous (Score)	Mean and Standard Deviation
	Level of knowledge	Categorical	Frequency and Percentage

To determine the level of attitude regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia.	Attitude regarding risk factors of cardiovascular diseases	Continuous (Score)	Mean and Standard Deviation
	Level of attitude	Categorical	Frequency and Percentage
To determine the level of practice regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health	Practice regarding risk factors of cardiovascular diseases	Continuous (Score)	Mean and Standard Deviation

science background in Universiti Putra Malaysia.	Level of practice	Categorical	Frequency and Percentage
Specific Objective	**Dependent Variables**	**Independent variable**	**Analyse**
To identify relationship between level of knowledge and level of practice regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia.	Practice regarding risk factors of cardiovascular diseases (Continuous)	Knowledge regarding risk factors of cardiovascular diseases (Continuous)	Pearson Correlation
To identify relationship between level of attitude and	Practice regarding risk	Attitude regarding risk	Pearson Correlation

level of practice regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia.	factors of cardiovascular diseases (Continuous)	factors of cardiovascular diseases (Continuous)	
To identify the association between sociodemographic data and level of knowledge regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia.	Knowledge regarding risk factors of cardiovascular diseases. (Continuous)	Year of Study (Categorical)	One Way Independent ANOVA
		Age (Continuous)	Pearson Correlation
		Faculty (Categorical)	One Way Independent ANOVA
		Ethnicity (Categorical)	One Way Independent ANOVA

		Family history of Cardiovascular diseases (Categorical)	One Way Independent ANOVA
To identify the relationship between sociodemographic data and level of attitude regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia.	Attitude regarding risk factors of cardiovascular diseases. (Continuous)	Year of Study (Categorical)	One Way Independent ANOVA
		Age (Continuous)	Pearson Correlation
		Faculty (Categorical)	One Way Independent ANOVA
		Ethnicity (Categorical)	One Way Independent ANOVA

		Family history of Cardiovascular diseases (Categorical)	One Way Independent ANOVA
To identify the relationship between sociodemographic data and level of practice regarding cardiovascular diseases and its risk factors among male undergraduate students with non-medical and health science background in Universiti Putra Malaysia.	Practice regarding risk factors of cardiovascular diseases. (Continuous)	Year of Study (Categorical)	One Way Independent ANOVA
		Age (Continuous)	Pearson Correlation
		Faculty (Categorical)	One Way Independent ANOVA
		Ethnicity (Categorical)	One Way Independent ANOVA

		Family history of Cardiovascular diseases (Categorical)	One Way Independent ANOVA

3.12 Validity and Reliability

After the ethical committee approve this research study, the data had been collected in pilot study and tested for reliability and internal consistency using the Cronbach's alpha correlation coefficient. The Cronbach's alpha reliability coefficient normally ranges between 0 and 1. The Cronbach's alpha values between 0.70 and 0.80 are considered satisfactory (Bland & Altman, 1997). The general rule of thumb is that a Cronbach's alpha of .70 and above is good, .80 and above is better, and .90 and above is best. The Cronbach's alpha had been calculated for reliability of this research using the pilot study.

All the items in the questionnaire had been reviewed by my supervisor which is a nursing lecturer and an English teacher to ensure face validity.

3.13 Pilot Study

Pilot study had been carried out on 17 male students from the study setting in which was excluded from the sample. The pilot test's result had been analysed by using Statistical Package for the Social Science (SPSS) Version 20.0 to get the Cronbach's alpha value for reliability. The Cronbach's alpha for knowledge, attitude and practice are 0.739, 0.718 and 0.792 respectively.

3.14 Ethical Consideration

A written approval and permission have been obtained from Ethics Committee for Research Involving Human Subject (JKEUPM).

All the participants had been provided with a participant information sheet about their willingness to join the study. After they click the consent, it will be directly to the next page which contain the questionnaire. Participants are free to ask any clarification about the study since the contact information of the researchers are provided.

The participant that withdraws from the study would not be included in data collection. Informed consents are compulsory to be taken from the participants. The participants must clearly understand regarding the study before giving their consent.

Participant confidential information will be kept and cannot be traceable by other individual and be kept secured in Google Account can only be accessed by the researcher by using 2-steps verification and secured password. The downloaded data will be kept in a password-protected computer, password protected thumb-drive for 5 years and will be permanently destroyed.

3.16 Declaration of conflict of interest

There is no conflict of interest anticipated in this study.

3.17 Honorarium and Incentives to Respondents

There was no token of appreciation given since this study conducted by online platform.

CHAPTER 4: RESULT

4.0 Introduction

This study was carried out among students in in Universiti Putra Malaysia from different faculties which are Faculty of Engineering, Faculty of Human Ecology, Faculty of Modern Languages and Communication, Faculty of Forestry. The results of this study are based on the data collected via questionnaire which include four sections which are Section A, Section B, Section C and Section D. Section A is about socio-demographic characteristics, Section B is about knowledge on risk factors of cardiovascular diseases and its preventive measure with two sub-sections focused on the sources of cardiovascular diseases' information and conditions related to cardiovascular diseases and Section C and Section D is about attitude and practice regarding cardiovascular diseases and its risk factors.

In this chapter, the descriptive analysis of section A, Section B, Section C and Section D were carried out and presented in table form. Lastly, association between sociodemographic characteristics and level of knowledge, attitude, and practice regarding cardiovascular diseases and its risk factors were determined and discussed.

Normality test had been done which resulted skewness and kurtosis for knowledge is 0.177 and -0.522, while skewness and kurtosis for attitude is -0.828 and 0.976, and lastly skewness and kurtosis for practice is 0.177 and -0.520, which is all the variable is in normal range of skewness which from -3 to +3 while normal range for kurtosis is from -10 to +10 (Brown, 2006; Griffin & Steinbrecher, (2013). Thus, parametric test had been used to analyze the data which are Pearson Correlation and one-way independent ANOVA.

4.1 Socio-demographic Characteristics

Table 1: Distribution of respondents by age, year of study, faculty, ethnicity, family history of cardiovascular diseases (CVD) and type of cardiovascular diseases (CVD) from family history, (N=181).

CHARACTERISTIC	N= 181	%	MEAN ≠ SD
Age			
20 years old	17	9.4	22.43 ≠ 1.30
21 years old	28	15.5	
22 years old	45	24.9	
23 years old	47	26.0	
24 years old	40	22.1	
25 years old	4	2.2	
Year of Study			
Year 1	17	9.4	
Year 2	32	17.7	
Year 3	59	32.6	
Year 4	72	39.8	
Year 5	1	0.6	

CHARACTERISTIC	N= 181	%	MEAN ≠ SD
Faculty			
Modern Languages and Communications	49	27.1	
Forestry	27	14.9	
Human Ecology	31	17.1	
Engineering	74	40.9	
	40	22.1	
	4	2.2	
Ethnicity			
Malay	132	72.9	
Chinese	26	14.4	
Indian	21	11.6	
Others (Saban)	1	0.6	
Others (Penan)	1	0.6	

CHARACTERISTIC	N= 181	%	MEAN ≠ SD
Family history of cardiovascular diseases (CVD)			
Grandfather	4	2.2	
Grandmother	2	1.1	
Father	44	24.3	
Mother	38	20.9	
Sibling(s)	4	2.2	
Uncle	5	2.8	
Great Uncle	1	0.6	
None	82	45.3	
Other	1	0.6	
Type of cardiovascular diseases (CVD)			
Heart Attack	24	13.3	
Hypertension	41	22.7	
Diabetes	20	11.0	
Stroke	12	6.6	
Hypertension and Diabetes	1	0.6	
None	82	45.3	
Other (Cancer)	1	0.6	

The total number of respondents of this study is 181. The mean and standard deviation for age of the respondents is 22.43 ≠ 1.30 years old with the mode of 23 years old. Many of the respondents were from Year 4 (39.8%, n=72), follow by Year 3 (32.6%, n=59), Year 2 (17.7%, n=32), Year 1 (9.4%, n=17) and Year 5 (0.6%, n=1). Furthermore, many respondents come from Faculty of Engineering (40.9%, n=74), follow by Modern Languages and Communications (27.1%, n=49), Faculty of Human Ecology (17.1, n=31) and Faculty of Forestry (14.9%, n=27). Out of 181 respondents, more than half of the respondents are Malay (72.9%, n=132), follow by Chinese (14.4%, n=26), Indian (11.6%, n=21), and another ethnicity from Borneo such as Saban (0.6%, n=1) and Penan (0.6%, n=1). Around 45.3% (n=82) respondents stated that they have no family history of cardiovascular disease (CVD), follow by 24.3% (n=44) respondents' family history of cardiovascular disease involving their father, 20.9% (n=38) respondents' family history of cardiovascular disease involving their mother, 2.8% (n=5) respondents' family history of cardiovascular disease involving their uncle, 2.2% (n=4) respondents' family history of cardiovascular disease involving their grandfather and another 2.2% (n=4) respondents' family history of cardiovascular disease involving sibling(s), 1.1% (n=2) respondents' family history of cardiovascular disease involving their grandmother, 0.6% (n=1) respondent's family history of cardiovascular disease involving great uncle and another 0.6% (n=1) stated others. For the type of cardiovascular disease from the family history stated previously, 45.3% (n=82) of the respondents stated none, follow by 22.7% (n=41) of the respondents stated hypertension, 13.3% (n=24) of the respondents stated heart attack, 11.0% (n=20) of the respondents stated diabetes, 6.6% (n=12) of the respondents stated stroke, 0.6%

(n=1) of the respondent stated hypertension and diabetes and another 0.6% (n=1) of the respondent stated others for cancer but not stated specifically the type of cancer.

4.2 Knowledge on risk factors of cardiovascular diseases and its preventive measure

Table 2: Distribution of respondents' answer regarding knowledge on risk factors of cardiovascular diseases and its preventive measure among male undergraduates' students with non-medical and health science background in Universiti Putra Malaysia, (N=181).

	QUESTION	3 TRUE N (%)	2 FALSE N (%)	1 DON'T KNOW N (%)
1	Cardiovascular diseases are the leading cause of death in Malaysia.	133 (73.5)	3 (1.7)	45 (24.9)
2	Light walking is a preventive factor for cardiovascular diseases.	170 (93.9)	7 (3.9)	4 (2.2)
3	Adequate exercise can prevent cardiovascular diseases.	173 (95.6)	3 (1.7)	5 (2.8)
4	Eating fruits or vegetables can prevent form cardiovascular diseases.	169 (93.4)	4 (2.2)	8 (4.4)

(*) = Negative statement

	QUESTION	3 TRUE N (%)	2 FALSE N (%)	1 DON'T KNOW N (%)
5	Most cardiovascular diseases cases are hereditary. (*)	102 (56.4)	23 (12.7)	56 (30.9)
6	Controlling high fat food consumption is essential.	146 (80.7)	13 (7.2)	22 (12.2)
7	Cardiovascular disease is a disease that is related to heart.	176 (97.2)	2 (1.1)	3 (1.7)
8	Cardiovascular disease is a disease that is related to blood vessels.	139 (76.8)	36 (19.9)	6 (3.3)
9	Tobacco cessation programs are available in your hometown.	44 (24.3)	20 (11.0)	117 (64.6)
10	Irregular eating patterns has no harm to your health. (*)	47 (26.0)	95 (52.5)	39 (21.5)
11	Cardiovascular diseases are the disease of women only. (*)	9 (5.0)	161 (89.0)	11 (6.1)
12	Doing housework as an exercise is enough for a day. (*)	29 (16.0)	55 (30.4)	97 (53.6)
13	If you have a slim body, you do not need to exercise. (*)	15 (8.3)	83 (45.9)	83 (45.9)

(*) = Negative statement

	QUESTION	3 TRUE N (%)	2 FALSE N (%)	1 DON'T KNOW N (%)
14	Cardiovascular diseases can occur to young people.	148 (81.8)	19 (10.5)	14 (7.7)
15	High density lipoprotein (HDL) is a good type of cholesterol.	94 (51.9)	11 (6.1)	76 (42.0)
16	Body Mass Index (BMI) more than 30 is considered as obese.	170 (93.9)	2 (1.1)	9 (5.0)
17	Prayer can help to reduce stress	162 (89.5)	7 (3.9)	12 (6.6)

(*) = Negative statement

The mode score for Section B for knowledge on risk factors of cardiovascular diseases and its preventive measure in this study is 45 while the mean and standard deviation score is 43.41 ≠ 2.92. Based on the result, almost all the respondents scored GOOD (99.4%, n=180) and only 1 (0.6%) respondent scored BAD for questions about knowledge on risk factors of cardiovascular diseases and its preventive measure.

The statement that has the highest number of respondents who answered correctly is "cardiovascular disease is a disease that is related to heart" (97.2%, n=176) follow by the statement "Adequate exercise can prevent cardiovascular diseases"

(95.6%, n=173). Other than that, other statement that majority of the respondents answered correct and equally the same which is (93.9%, n=170) are “Light walking is a preventive factor for cardiovascular diseases” and “Body Mass Index (BMI) more than 30 is considered as obese”. Moreover, most of the respondents give correct responses about eating fruits or vegetables can prevent form cardiovascular diseases (93.4%, n=169), prayer can help to reduce stress (89.5%, n=162) and cardiovascular diseases are the disease of women only (89.0%, n=161).

High number of respondents also answered that cardiovascular diseases can occur to young people (81.8%, n=148), controlling high fat food consumption is essential (80.7%, n=146), cardiovascular disease is a disease that is related to blood vessels (76.8%, n=139) cardiovascular diseases are the leading cause of death in Malaysia (73.5%, n=133) which all of them are correct. However, almost half of the respondents answered most cardiovascular diseases cases are hereditary (56.4%, n=102) which is false. Most of the respondents answered correctly regarding the statement high density lipoprotein (HDL) is a good type of cholesterol (51.9%, n=94) but there are almost half of the respondents that did not know about it (42.0%, n=76) and a little number of respondents stated that the statement is false (6.1%, n=11).

More than half of the respondents did not know (64.6%, n=117) whether tobacco cessation programs are available in their hometown but there is a little number of respondents (26.0%, n=44) answered that indicate that there is tobacco cessation in their hometown and another number of respondents answered that indicate that there is

no tobacco cessation in their hometown (11.0%, n=20). There is also majority number answered correctly regarding irregular eating patterns has no harm to your health (52.5%, n=95). There are high number of respondents that answer did not know (53.6, n=97) doing housework as an exercise is enough for a day. There are also almost half of the respondents answered equally correct (45.9%, n=83) and did not know (45.9%, n=83) on statement “If you have a slim body, you do not need to exercise”.

4.3 Attitude regarding cardiovascular diseases and its risk factor.

Table 3: Distribution of respondents' answer regarding attitude regarding cardiovascular diseases and its risk factors among male undergraduates' students with non-medical and health science background in Universiti Putra Malaysia.

	QUESTION	1	2	3	4	5
		SD	D	U	A	SA
		N (%)	N (%)	N (%)	N (%)	N (%)
1	I should be doing exercise to maintain a healthy lifestyle.	3 (1.7)	0 (0.0)	0 (0.0)	34 (18.8)	144 (79.6)
2	If I need to go to places somewhere near, I choose to walk rather than taking any other mean of transportation (E.g., Going to class or café).	2 (1.1)	4 (2.2)	35 (19.3)	64 (35.4)	76 (42.0)

(*) = Negative Statement, SD=Strongly Disagree, D=Disagree, Uncertain, A=Agree, SA=Strongly Agree

	QUESTION	1	2	3	4	5
		SD	D	U	A	SA
		N (%)	N (%)	N (%)	N (%)	N (%)
3	I know smoking is bad for health.	3 (1.7)	0 (0.0)	1 (0.6)	36 (19.9)	141 (77.9)
4	I should maintain my weight according to my Body Mass Index (BMI).	1 (0.6)	1 (0.6)	6 (3.3)	41 (22.7)	132 (72.9)
5	I should take less oily food for healthy lifestyle.	2 (1.1)	0 (0.0)	10 (5.5)	44 (24.3)	125 (69.1)
6	I prefer to play with my laptop instead of doing exercise. (*)	21 (11.6)	41 (22.7)	82 (45.3)	35 (19.3)	2 (1.1)
7	I read the nutrition information of each product that I intended to buy.	1 (0.6)	13 (7.2)	103 (56.9)	44 (24.3)	20 (11.0)

(*) = Negative Statement, SD=Strongly Disagree, D=Disagree, Uncertain, A=Agree, SA=Strongly Agree

	QUESTION	1	2	3	4	5
		SD	D	U	A	SA
		N (%)	N (%)	N (%)	N (%)	N (%)
8	I choose to eat or buy fast food when going out with friends. (*)	59 (32.6)	74 (40.9)	34 (18.8)	10 (5.5)	4 (2.2)
9	I can manage my stress.	4 (2.2)	5 (2.8)	36 (19.9)	77 (42.5)	59 (32.6)
10	I should avoid drinking carbonated drinks.	3 (1.7)	1 (0.6)	13 (7.2)	76 (42.0)	88 (48.6)
11	Sometimes, I eat supper late at night before sleep. (*)	63 (34.8)	80 (44.2)	22 (12.2)	11 (6.1)	5 (2.8)

(*) = Negative Statement, SD=Strongly Disagree, D=Disagree, Uncertain, A=Agree, SA=Strongly Agree

	QUESTION	1	2	3	4	5
		SD	D	U	A	SA
		N (%)	N (%)	N (%)	N (%)	N (%)
12	I believe walking a lot can give benefits to my health.	1 (0.6)	1 (0.6)	5 (2.8)	53 (29.3)	121 (66.9)
13	I should take fruit or vegetable in my diet for maintaining my health.	1 (0.6)	0 (0.0)	3 (1.7)	35 (19.3)	142 (78.5)
14	I should control my stress to avoid from getting any disease.	0 (0.0)	3 (1.7)	14 (7.7)	56 (30.9)	108 (59.7)

(*) = Negative Statement, SD=Strongly Disagree, D=Disagree, Uncertain, A=Agree, SA=Strongly Agree

The mode score for Section C for attitude regarding cardiovascular diseases and its risk factor in this study is 56 while the mean and standard deviation score is $55.31 \neq 4.57$. Based on the result, almost all the respondents scored HIGH level (81.2%, n=147) while 33 (18.2%) respondents scored INTERMEDIATE level, and 1 (0.6%) respondent scored LOW level regarding questions about attitude regarding cardiovascular diseases and its risk factor.

The statement that has the highest number of respondents answered strongly agree is “I should be doing exercise to maintain a healthy lifestyle.” (79.6%, n=144) follow by the statement “I should take fruit or vegetable in my diet for maintaining my health.” (78.5%, n=142). Other than that, other statement that majority of the respondents answered strongly agree is “I know smoking is bad for health.” (93.9%, n=170) follow by the statement “I should maintain my weight according to my Body Mass Index (BMI).” (72.9%, n=132). Moreover, most of the respondents strongly agree about take less oily food for healthy lifestyle (69.1%, n=125), walking a lot can give benefits to health (66.9%, n=121) and control stress to avoid from getting any disease (59.7%, n=108).

However, more than half of the respondents are uncertain regarding the statements “I read the nutrition information of each product that I intended to buy.” (56.9%, n=103). Another statement that most of the respondents answered uncertain is “I prefer to play with my laptop instead of doing exercise.” (45.3%, n=82). Most of the respondents answered disagree the most for the statement “Sometimes, I eat supper late at night before sleep.” (44.2%, n=80) and “I choose to eat or buy fast food when going out with friends.” (40.9%, n=74). On the other hand, the statements that most respondents answered agree is “I can manage my stress” which is (42.5%, n=77)

48.6% (n=88) of the respondents answered strongly agree for the statement “I should avoid drinking carbonated drinks.” follow by the statement “If I need to go to places somewhere near, I choose to walk rather than taking any other mean of

transportation (E.g., Going to class or café).” (42.0%, n=76).

4.4 Practice regarding cardiovascular diseases and its risk factors

Table 4: Distribution of respondents' answer regarding practice regarding Cardiovascular diseases and its risk factors among male undergraduates' students with non-medical and health science background in Universiti Putra Malaysia.

	QUESTION	1	2	3	4
		ALWAYS	FREQUENTLY	SELDOM	NEVER
		N (%)	N (%)	N (%)	N (%)
1	Do you take any supplement or special diet? (E.g., Evening Primrose Oil, Oat diet, etc.) (*)	114 (63.0)	44 (24.3)	21 (11.6)	2 (1.1)
2	Does your daily activity involve vigorousactivity? (E.g., heavy lifting, digging)	4 (2.2)	26 (14.4)	60 (33.1)	91 (50.3)

(*) = Negative statement

	QUESTION	1	2	3	4
		ALWAYS	FREQUENTLY	SELDOM	NEVER
		N (%)	N (%)	N (%)	N (%)
3	Do you walk for at least 10 minutes to get toand from places? (E.g., from café, classes, mosques, etc.) (*)	4 (2.2)	60 (33.1)	77 (42.5)	40 (22.1)
4	Do you spend your leisure time to exercise atleast 20 minutes per session? (*)	75 (41.4)	70 (38.7)	27 (14.9)	9 (5.0)
5	How often do you take fruits in your diet? (*)	0 (0.0)	39 (21.5)	65 (35.9)	77 (42.5)
6	How often do you take vegetables in your diet? (*)	3 (1.7)	49 (27.1)	58 (32.0)	71 (39.2)
7	How often do you eat fast food?	41 (22.7)	99 (54.7)	38 (21.0)	3 (1.7)

(*) = Negative statement

	QUESTION	1	2	3	4
		ALWAYS	FREQUENTLY	SELDOM	NEVER
		N (%)	N (%)	N (%)	N (%)
8	Do you like to eat in between main meals? (E.g.,snacking, eating biscuits, etc.)	49 (27.1)	102 (56.4)	29 (16.0)	1 (0.6)
9	Do you take fried food as your main course?	57 (31.5)	91 (50.3)	29 (16.0)	4 (2.2)
10	Do you lead a stressful life?	16 (8.8)	39 (21.5)	120 (66.3)	5 (2.8)

(*) = Negative statement

The mode score for Section D for practice regarding cardiovascular diseases and its risk factor in this study is 25 while the mean and standard deviation score is 24.28 ≠ 3.06. Based on the result, almost all the respondents scored INTERMEDIATE level (85.6%, n=155), 22 (12.2%) respondents scored LOW level, and 4 (2.3%) respondents scored HIGH level regarding questions about attitude regarding cardiovascular diseases and its risk factor.

The statement that has the highest number of respondents answered seldom is "Do you lead a stressful life?" (66.3%, n=120) follow by the statement "Do you walk for at least 10 minutes to get to and from places? (E.g., from café, classes, mosques, etc.)" (42.5%, n=77). Other than that, other statement that majority of the respondents answered always is "Do you take any supplement or special diet? (E.g., Evening Primrose Oil, Oat diet, etc.)" (63.0%, n=114) follow by the statement "Do you spend your leisure time to exercise at least 20 minutes per session?" (41.4%, n=75). Moreover, more than half of the respondents answered frequently where they like to eat in between main meals (E.g., snacking, eating biscuits, etc.) (56.4%, n=102), eat fast food (54.7%, n=99) and take fried food as their main course (50.3%, n=91).

However, most of the respondents never take fruits in their diet (42.5%, n=77) and never take vegetables in their diet (39.2%, n=71). There are also quite half from the respondents answered that they never involve vigorous activity in their daily activity (E.g., heavy lifting, digging) (50.3%, n=91).

4.5 Level of knowledge, attitude and practice regarding cardiovascular diseases and its risk factors

Table 5: Distribution of respondents' answer to determine the level of knowledge on risk factors of cardiovascular diseases and its preventive measure among male undergraduates' students with non-medical and health science background in Universiti Putra Malaysia.

VARIABLE	POOR	GOOD
	N (%)	N (%)
KNOWLEDGE	1 (0.6)	180 (99.4)

Based on analysis, it had showed that the respondents have good regarding knowledge on risk factors of cardiovascular diseases and its preventive measure.

Table 6: Distribution of respondents' answer to determine the level of attitude and practice regarding cardiovascular diseases and its risk factors among male undergraduates' students with non-medical and health science background in Universiti Putra Malaysia.

VARIABLE	LOW	INTERMEDIATE	HIGH
	N (%)	N (%)	N (%)
ATTITUDE	1 (0.6)	33 (18.2)	147 (81.2)
PRACTICE	22 (12.2)	155 (85.6)	4 (2.3)

Based on analysis, it had showed that the respondents achieve high level of attitude and intermediate level of practice regarding risk factors of cardiovascular diseases and its preventive measure.

4.6 Relationship between knowledge and practice regarding cardiovascular diseases and its risk factors

Table 7: Distribution of relationship between knowledge on risk factors of cardiovascular diseases and its preventive measure and practice regarding cardiovascular diseases and its risk factors among male undergraduates' students with non-medical and health science background in Universiti Putra Malaysia.

VARIABLES	PRACTICE	
	r	p- value
KNOWLEDGE	0.316	0.000

*$p \leq 0.05$ considered as statistically significant

Pearson correlation analysis had showed that there is a significant relationship between knowledge on risk factors of cardiovascular diseases and its preventive measure and practice regarding cardiovascular diseases and its risk factors among male undergraduates' students with non-medical and health science background in Universiti Putra Malaysia.

4.7 Relationship between attitude and practice regarding cardiovascular diseases and its risk factors

Table 8: Distribution of relationship between attitude and practice regarding cardiovascular diseases and its risk factors among male undergraduates' students with non-medical and health science background in Universiti Putra Malaysia.

VARIABLES	PRACTICE	
	r	p- value
ATTITUDE	0.263	0.000

*$p \leq 0.05$ considered as statistically significant

Pearson correlation analysis had showed that there is a significant relationship between attitude and practice regarding cardiovascular diseases and its risk factors among male undergraduates' students with non-medical and health science background in Universiti Putra Malaysia.

4.8 Association between sociodemographic characteristics and level of knowledge on risk factors of cardiovascular diseases and its preventive measure.

Table 7: Distribution of association between sociodemographic characteristics and level of knowledge on risk factors of cardiovascular diseases and its preventive measure among males' undergraduates' students with non-medical and health science background in Universiti Putra Malaysia.

CHARACTERISTIC	KNOWLEDGE ON RISK FACTORS OF CARDIOVASCULAR DISEASES AND ITS PREVENTIVE MEASURE		
	Mean (95% CI)	df	p-value
Age	r = 0.018		0.814

*p ≤ 0.05 considered as statistically significant

CHARACTERISTIC	KNOWLEDGE ON RISK FACTORS OF CARDIOVASCULAR DISEASES AND ITS PREVENTIVE MEASURE		
	Mean (95% CI)	**df**	**p-value**
Year of Study		4	0.167
Year 1	42.65 (41.17- 44.12)		
Year 2	43.34 (42.55 - 44.13)		
Year 3	43.54 (42.71 - 44.38)		
Year 4	43.61 (42.93 - 44.29)		
Year 5	37.00 (00.00 – 00.00)		

*$p \leq 0.05$ considered as statistically significant

CHARACTERISTIC	KNOWLEDGE ON RISK FACTORS OF CARDIOVASCULAR DISEASES AND ITS PREVENTIVE MEASURE		
	Mean (95% CI)	**df**	**p-value**
Faculty		3	0.076
Modern Languages and Communications	43.98 (43.22 - 44.74)		
Forestry	43.44 (42.38 - 44.51)		
Human Ecology	44.03 (42.86 - 45.21)		
Engineering	42.77 (42.08 - 43.46)		

*$p \leq 0.05$ considered as statistically significant

CHARACTERISTIC	KNOWLEDGE ON RISK FACTORS OF CARDIOVASCULAR DISEASES AND ITS PREVENTIVE MEASURE		
	Mean (95% CI)	**df**	**p-value**
Ethnicity		4	0.003
Malay	43.45 (42.97 – 43.94)		
Chinese	43.35 (42.19 – 44.51)		
Indian	43.95 (42.74 – 45.17)		
Others (Saban)	33.00 (00.00 – 00.00)		
Others (Penan)	39.00 (00.00 – 00.00)		

*$p \leq 0.05$ considered as statistically significant

CHARACTERISTIC	KNOWLEDGE ON RISK FACTORS OF CARDIOVASCULAR DISEASES AND ITS PREVENTIVE MEASURE		
	Mean (95% CI)	**df**	**p-value**
Family history of cardiovascular diseases (CVD)		8	0.000
Grandfather	46.25 (43.86 – 48.64)		
Grandmother	46.50 (14.73 – 78.27)		
Father	44.09 (43.20 – 44.98)		
Mother	43.31 (42.33 – 44.30)		
Sibling(s)	44.00 (39.89 – 48.11)		
Uncle	45.80 (43.76 – 47.84)		

*$p \leq 0.05$ considered as statistically significant

CHARACTERISTIC	KNOWLEDGE ON RISK FACTORS OF CARDIOVASCULAR DISEASES AND ITS PREVENTIVE MEASURE		
	Mean (95% CI)	**df**	**p-value**
Family history of cardiovascular diseases (CVD)			
Great Uncle	33.00 (00.00 – 00.00)		
None	42.72 (42.15 - 43.30)		
Other	46.67 (45.23 – 48.10)		

*$p \leq 0.05$ considered as statistically significant

One-way independent ANNOVA is used to determine the association between year of study, faculty of the study population, ethnicity, and family history of cardiovascular diseases with level of knowledge on risk factors of cardiovascular diseases and its preventive measure. The result had showed that there is no significant association between year of study, and faculty of the study population and level of knowledge on risk factors of cardiovascular diseases and its preventive measure. The result also

showed that there is significant association between ethnicity, and family history of cardiovascular diseases and level of knowledge on risk factors of cardiovascular diseases and its preventive measure.

Pearson correlation is used to determine the association between age and level of knowledge on risk factors of cardiovascular diseases and its preventive measure. The result had showed that there is no significant association between age and level of knowledge on risk factors of cardiovascular diseases and its preventive measure.

4.9 Association of association between sociodemographic characteristics and level of attitude regarding cardiovascular diseases and its risk factors.

Table 8: Distribution of association between sociodemographic characteristics and level of attitude regarding cardiovascular diseases and its risk factors among male undergraduates' students with non-medical and health science background in Universiti Putra Malaysia.

CHARACTERISTIC	ATTITUDE REGARDING CARDIOVASCULAR DISEASES AND ITS RISK FACTORS		
	Mean (95% CI)	df	p-value
Age	r = -0.101		0.174

*$p \leq 0.05$ considered as statistically significant

CHARACTERISTIC	ATTITUDE REGARDING CARDIOVASCULAR DISEASES AND ITS RISK FACTORS		
	Mean (95% CI)	**df**	**p-value**
Year of Study		4	0.122
Year 1	56.12 (54.45 - 57.78)		
Year 2	55.53 (54.34 - 56.72)		
Year 3	55.54 (54.00 - 57.09)		
Year 4	54.99 (54.07 - 55.90)		
Year 5	44.00 (00.00 - 00.00)		

*$p \leq 0.05$ considered as statistically significant

CHARACTERISTIC	ATTITUDE REGARDING CARDIOVASCULAR DISEASES AND ITS RISK FACTORS		
	Mean (95% CI)	**df**	**p-value**
Faculty	55.73	3	0.133
Modern Languages and Communications	(54.76 - 56.71)		
Forestry	55.56		
	(53.66 - 57.45)		
Human Ecology	56.55		
	(55.30 - 57.80)		
Engineering	54.42		
	(53.16 - 55.67)		

*$p \leq 0.05$ considered as statistically significant

CHARACTERISTIC	ATTITUDE REGARDING CARDIOVASCULAR DISEASES AND ITS RISK FACTORS		
	Mean (95% CI)	**df**	**p-value**
Ethnicity		4	0.000
Malay	55.68 (55.00 – 56.36)		
Chinese	54.73 (53.13 – 56.34)		
Indian	55.52 (53.77 – 57.28)		
Others (Saban)	25.00 (00.00 – 00.00)		
Others (Penan)	47.00 (00.00 – 00.00)		

*$p \leq 0.05$ considered as statistically significant

CHARACTERISTIC	ATTITUDE REGARDING CARDIOVASCULAR DISEASES AND ITS RISK FACTORS		
	Mean (95% CI)	**df**	**p-value**
Family history of cardiovascular diseases (CVD)		8	0.000
Grandfather	59.00 (56.09 – 61.91)		
Grandmother	58.00 (19.88 – 96.12)		
Father	55.86 (54.65 – 57.07)		
Mother	56.11 (54.70 – 57.53)		
Sibling(s)	57.25 (49.74 – 64.76)		

*$p \leq 0.05$ considered as statistically significant

CHARACTERISTIC	ATTITUDE REGARDING CARDIOVASCULAR DISEASES AND ITS RISK FACTORS		
	Mean (95% CI)	**df**	**p-value**
Family history of cardiovascular diseases (CVD)			
Uncle	55.80 (51.74 – 59.86)		
Great Uncle	25.00 (00.00 -00.00)		
None	54.64 (53.79 – 55.49)		
Other	56.33 (44.59 – 68.07)		

*$p \leq 0.05$ considered as statistically significant

One-way independent ANNOVA is used to determine the association between year of study, faculty of the study population, ethnicity, and family history of cardiovascular diseases and level of attitude regarding cardiovascular diseases and its risk factors. The result had showed that there is no significant association between year of study, and faculty of the study population and level of attitude regarding cardiovascular diseases and its risk factors. The result also showed that there is significant association between ethnicity, and family history of cardiovascular diseases and level of attitude regarding cardiovascular diseases and its risk factors.

`Pearson correlation is used to determine the association between age and level of attitude regarding cardiovascular diseases and its risk factors. The result had showed that there is no significant association between age and level of attitude regarding cardiovascular diseases and its risk factors.

4.10 Association of association between sociodemographic characteristics and level of practice regarding cardiovascular diseases and its risk factors.

Table 9: Distribution of association between sociodemographic characteristics and level of practice regarding cardiovascular diseases and its risk factors among male undergraduates' students with non-medical and health science background in Universiti Putra Malaysia.

CHARACTERISTIC	PRACTICE REGARDING CARDIOVASCULAR DISEASES AND ITS RISK FACTORS		
	Mean (95% CI)	df	p-value
Age	r = -0.164		0.028

*p ≤ 0.05 considered as statistically significant

CHARACTERISTIC	PRACTICE REGARDING CARDIOVASCULAR DISEASES AND ITS RISK FACTORS		
	Mean (95% CI)	**df**	**p-value**
Year of Study		4	0.324
Year 1	25.71 (23.73 – 27.68)		
Year 2	24.31 (23.24 – 25.39)		
Year 3	24.25 (23.49 – 25.02)		
Year 4	23.93 (23.22 – 24.63)		
Year 5	25.00 (00.00 – 00.00)		

*$p \leq 0.05$ considered as statistically significant

CHARACTERISTIC	PRACTICE REGARDING CARDIOVASCULAR DISEASES AND ITS RISK FACTORS		
	Mean (95% CI)	**df**	**p-value**
Faculty		3	0.381
Modern Languages and Communications	24.63 (23.66 – 25.60)		
Forestry	24.30 (23.01 – 25.58)		
Human Ecology	24.77 (23.67 – 25.87)		
Engineering	23.82 (23.17 – 24.47)		

*$p \leq 0.05$ considered as statistically significant

CHARACTERISTIC	PRACTICE REGARDING CARDIOVASCULAR DISEASES AND ITS RISK FACTORS		
	Mean (95% CI)	**df**	**p-value**
Ethnicity		4	0.098
Malay	24.13 (23.58-24.68)		
Chinese	25.58 (24.61 – 26.55)		
Indian	23.90 (22.60 – 25.20)		
Others (Saban)	20.00 (00.00 – 00.00)		
Others (Penan)	22.00 (00.00 – 00.00)		

*$p \leq 0.05$ considered as statistically significant

CHARACTERISTIC	PRACTICE REGARDING CARDIOVASCULAR DISEASES AND ITS RISK FACTORS		
	Mean (95% CI)	**df**	**p-value**
Family history of cardiovascular diseases (CVD)		8	0.000
Grandfather	26.00 (20.97 – 31.03)		
Grandmother	28.00 (28.00 – 28.00)		
Father	24.07 (23.08 – 25.06)		
Mother	23.35 (22.40 – 24.28)		
Sibling(s)	30.25 (24.83 – 35.67)		

*$p \leq 0.05$ considered as statistically significant

CHARACTERISTIC	PRACTICE REGARDING CARDIOVASCULAR DISEASES AND ITS RISK FACTORS		
	Mean (95% CI)	df	p-value
Family history of cardiovascular diseases (CVD)			
Uncle	24.40 (22.32 – 26.48)		
Great Uncle	20.00 (00.00 – 00.00)		
None	24.28 (23.66 – 24.90)		
Other	26.67 (21.50 – 31.84)		

*$p \leq 0.05$ considered as statistically significant

One-way independent ANNOVA is used to determine the association between year of study, faculty of the study population, ethnicity, and family history of cardiovascular diseases and level of practice regarding cardiovascular diseases and its risk factors. The result had showed that there is no significant association between year of study, faculty of the study population and ethnicity, and level of practice regarding cardiovascular

diseases and its risk factors. The result also showed significant association between family history of cardiovascular diseases and level of attitude regarding cardiovascular diseases and its risk factors.

Pearson correlation is used to determine the association between age and level of practice regarding cardiovascular diseases and its risk factors. The result had showed that there is significant association between age and level of practice regarding cardiovascular diseases and its risk factors.

CHAPTER 5: DISCUSSION AND CONCLUSION

5.0 Introduction

The findings of this study are discussed further in this chapter based on the objectives set. The discussion includes all the results of the descriptive findings of the respondents' sociodemographic characterize by age, year of study, faculty, ethnicity, family history of cardiovascular diseases and type of cardiovascular diseases from the family history. The descriptive result of knowledge on risk factors of cardiovascular diseases and its preventive measure, attitude and practice regarding cardiovascular diseases and its risk factors will also be discussed. Furthermore, the level of knowledge on risk factors of cardiovascular diseases and its preventive measure, attitude and practice regarding cardiovascular diseases and its risk factors will be explored in this chapter. The relationship between knowledge on risk factors of cardiovascular diseases and its preventive measure and attitude regarding cardiovascular diseases and its risk factors towards practice regarding cardiovascular diseases and its risk factors will be studied. Finally, the association between sociodemographic characteristics and level of knowledge on risk factors of cardiovascular diseases and its preventive measure, level of attitude and practice regarding cardiovascular diseases and its risk factors will also be explored in this chapter.

5.1 Characteristics of Sociodemographic

In this study, the age of the respondents varies from 20 to 25 years old with the mean and standard deviation for age of the respondents is 22.43 ≠ 1.30 years old with the mode of 23 years old. The mean age is similar as the study done by Mardhiah Mahada, Nor Azlina, Nor Iza and Mainul Haque (2016) where they have 22.5 ± 1.3 as their average of of the respondents. All the respondents are undergraduate students which is similar to the same study done by Mardhiah Mahada, Nor Azlina, Nor Iza and Mainul Haque (2016) where their respondents also involving undergraduates' students from every year of study, but the different characteristics present in this study as only male students were involved in this while in their study were involving female and male student.

Furthermore, this study involving students from faculties which excludes students from Faculty of Medical and Health Sciences as it had been presumed that the respondents are from health and science faculty thus they will have basic knowledge regarding health condition such as cardiovascular diseases and its risk factor which consistent with the result of the study where majority of the respondents from Faculty of Science, Pharmacy, Medicine, Allied Health Sciences, Dentistry and Nursing have high knowledge regarding the cardiovascular diseases and its risk factors (Mardhiah Mahada, Nor Azlina, Nor Iza & Mainul Haque, 2016).

Other than that, majority of the respondents for this study are Malays which is 72.9% where it is quite similar to studies done by Nursyafiza, Nor Azlina, and Mainul Haque (2018) and Ranimah, Rosediani and Harmy (2012) which is 86% and 98.4% respectively. However, the distribution of the respondents from year 1 to Year 4 is not consistent with the same study by Mardhiah Mahada, Nor Azlina, Nor Iza and Mainul Haque (2016) as in this study the distribution of Year 1, Year 2, year 3 and Year 4 is 9.4%, 17.7%, 32.6% and 39.8% respectively while the other study's distribution of Year 1, Year 2, year 3 and Year 4 is 21%, 30%, 27% and 22% respectively.

As for the family history of cardiovascular diseases, the result for this study did not consistent with the other study done by Mardhiah Mahada, Nor Azlina, Nor Iza and Mainul Haque (2016) where there is 39%, 30%, 6%, and 25% respectively for the respondents' fathers, mothers, siblings and others whose have history of Cardiovascular Disease in that study whereas in this study there is 24.3%, 20.9%, 2.2% and 7.3% respectively for the respondents' fathers, mothers, siblings and others whose have history of Cardiovascular Disease. Other than that, the type of Cardiovascular Diseases that the respondents' family and relatives suffering in this study is by 22.7%, 13.3%, 11.0%, 6.6% and 1.1% for hypertension, heart attack, diabetes, stroke and other diseases related to Cardiovascular Disease, respectively while other study stated their distribution of the respondents' relatives suffered from hypertension, heart attack, stroke or other types of chronic diseases is 58%, 19%, 13%, and 10%, respectively (Mardhiah Mahada, Nor Azlina, Nor Iza & Mainul Haque, 2016).

5.2 Knowledge Regarding Cardiovascular diseases and Its Risk Factors

The mode and median score for knowledge on risk factors of cardiovascular diseases and its preventive measure in this study is 45 and 43.00 respectively, while the mean and standard deviation score is 43.41 ≠ 2.92 where the median score is similar with another study by and Mardhiah Mahada, Nor Azlina, Nor Iza and Mainul Haque (2016) which is also 43. Based on the result, almost all the respondents scored GOOD (99.4%, n=180) and only 1 (0.6%) respondent scored BAD for questions about knowledge on risk factors of cardiovascular diseases and its preventive measure.

The studies in Malaysia involving knowledge regarding cardiovascular diseases and its preventive measures shows that most of the respondents showed that they have good level of knowledge. A study done by Nursyafiza, Nor Azlina, and Mainul Haque (2018) in the North-East coast of Malaysia shows that their respondents showed good level of knowledge regarding cardiovascular diseases as the mean and standard deviation score obtained from this study was 60.75 ≠ 4.82 from the full scores of 75.00 and majority of them which scored the highest in the survey which is 88% of the respondents able to know that irregular eating patterns could bring harm and 88% of the respondents also able to identify that eating fruits or vegetables and prayer could reduce stress as the preventive measures for cardiovascular diseases. There is some different regarding the result in this study as 26% of the respondents able to know that irregular eating patterns could bring harm but 93.4% of the respondents agreed that eating fruits or vegetables and 89.5% of the respondents in this study agreed that prayer could reduce stress as the preventive measures for cardiovascular diseases.

However, there is some opposite stand between the study by Nursyafiza, Nor Azlina, and Mainul Haque (2018) and Mardhiah Mahada, Nor Azlina, Nor Iza and Mainul Haque (2016) where Nursyafiza, Nor Azlina, and Mainul Haque (2018) stated that light walking could not prevent cardiovascular diseases but Mardhiah Mahada, Nor Azlina, Nor Iza and Mainul Haque (2016) stated that answering light walking can prevent cardiovascular diseases are their expected answer from the respondents. According to Chastin et al. (2019) casual walking, doing household chores or any activity daily living are included in Light-Intensity Physical Activity (LIPA) and there is other study by Batacan et. al (2015) concluded that there is no evidence that could support the statement of Light-Intensity Physical Activity (LIPA) have effect on any positive changes towards cardiovascular diseases risk factors in healthy adults. As this study, happened to have permission on having the questionnaires from Mardhiah Mahada, Nor Azlina, Nor Iza and Mainul Haque (2016), so this study follows the expected answer that light walking can prevent cardiovascular diseases as there is also a study done by Murtagh, Murphy and Boone-Heinonen (2010) stated there is evidence of epidemiological research study suggests that it is preferable for there is little improvements in daily walking than having no walking, and having high improvements could give big amount of benefits in cardiovascular health. Patients may see short-term improvements in term of fitness, body composition, blood pressure, and lipid profiles while the long-term advantages include a lower risk of coronary heart diseases, coronary events, and death. Therefore, the study also concluded that there is minimal risk of injury with this form of physical activity.

Another separated study where it also took place at the North-East coast of Malaysia showed the mean and standard deviation for knowledge regarding cardiovascular disease scored 36.8 ≠ 7.14 with the percentage score was 55.6% which shows that more than half of the respondent acknowledge matters regarding cardiovascular diseases where they are considered of having average knowledge regarding cardiovascular diseases and most of the respondents in the study stated that they could get the information regarding cardiovascular diseases from many sources such as 52.2% of the respondents stated that they gain knowledge regarding cardiovascular diseases from the television or book and 26.8% of the respondents stated that they gain knowledge regarding cardiovascular diseases from health care worker (Ranimah, Rosediani and Harmy, 2012).

In addition, a study involving students from public university in Malaysia by Mardhiah Mahada, Nor Azlina, Nor Iza and Mainul Haque (2016) where it resulted majority of the respondents in the study have good knowledge regarding cardiovascular diseases and its preventive measures where they scored the mean and standard deviation of total knowledge scores which is 42.98±2.46 regarding cardiovascular diseases and its preventive measures. The question which all the respondents answer true is prayer could reduce stress as the preventive measures for cardiovascular diseases which quite similar as majority of the respondents which is 89.5% of the respondents in this study agreed on the same question. A study done by Sadeghimoghaddam, Alavi, Mehrabi, and Bankpoor-Fard (2019) stated that the interventions of prayer therapy are effective on promoting hope and decrease the anxiety in patients with coronary artery diseases and

provide optimal, short-term, and simple-to-implement options to meet the goals of patients with heart disease and improve their psychological indicators.

Furthermore, there is also study done by foreign country such as Iran where it is exactly 80% respondents achieved highly satisfactory level of knowledge regarding cardiovascular diseases and there is more than 70% of the respondents acknowledge minimally one symptoms of cardiovascular diseases and aware that the death in Iran is mainly cause by cardiovascular diseases (Koohi & Khalili, 2020). Another study done by Sumaira Ejaz, Muhammad Afzal, Muhammad Husain, Haira Sarwar and Syed Amir Gilani (2018) involving rural community in Pakistan showed that they are having high level of knowledge regarding cardiovascular diseases and its preventive measures. This suggested that knowledge could be obtained even when the respondents are staying at home as every issue around the world could be obtained by the tips of our finger. 63.6% of the respondents in a study by Sumaira Ejaz, Muhammad Afzal, Muhammad Husain, Haira Sarwar and Syed Amir Gilani (2018) answered smoking is the risk factor of cardiovascular diseases. Other than that, in the same study by Sumaira Ejaz, Muhammad Afzal, Muhammad Husain, Haira Sarwar and Syed Amir Gilani (2018), majority of the respondents on the study answered that cardiovascular diseases is related to blood vessels and heart which consistent with the result of this study where 97.2% stated that they agreed cardiovascular diseases is a disease that is related to heart and another 76.8% of respondents agreed that cardiovascular diseases is a disease that is related to blood vessels which both of the question answered by majority of the respondents which is true since according to National Health Services (NHS) of United

Kingdom stated that cardiovascular disease is a general term that had been used for conditioning affecting blood vessels and heart.

The result from Sumaira Ejaz, Muhammad Afzal, Muhammad Husain, Haira Sarwar and Syed Amir Gilani (2018) research study quite similar with another study done at sub-metropolitan city in Banke District of Nepal showed that 23.3% of the respondents had good knowledge and 40.7% of the respondents having average knowledge where the study indicated that their respondents are having adequate knowledge as they interpret respondents with good and average knowledge as having adequate knowledge where there are 88.7% respondents which could be considered as majority of the respondents had known the meaning of cardiovascular disease as the condition of a group of disorder that involving heart and blood vessel (Tharu & Rawal, 2021).

On the other hand, a study done involving African American young adults showed that the result of the respondents having knowledge regarding cardiovascular diseases varies and inconsistent (Winham & Jones, 2011). 87.8% of the respondents of the study by Winham and Jones (2011) stated that family history of heart diseases will be the major causes of heart disease which quite similar where almost half of the respondents answered that most cardiovascular diseases case are hereditary. According to Centers for Disease Control and Prevention (CDC) (2019), hereditary process is when members of family are passing the genetic traits from one generation to another

generation and genetic inheritance are likely to play role in high blood pressure, heart disease and other related cardiovascular diseases conditions and the risk will be increasing when they share the same environments and other factors that could contribute to high risk of getting heart diseases.

5.3 Attitude Regarding Cardiovascular diseases and Its Risk Factors

The mode and median score for Section C for attitude regarding cardiovascular diseases and its risk factor in this study is 56 and 56.00 respectively, while the mean and standard deviation score is 55.31 ≠ 4.57. Based on the result, almost all the respondents scored HIGH level (81.2%, n=147) while 33 (18.2%) respondents scored INTERMEDIATE level, and 1 (0.6%) respondent scored LOW level regarding questions about attitude regarding cardiovascular diseases and its risk factor.

A research study done by Nursyafiza, Nor Azlina, and Mainul Haque (2018) where their research respondents showed positive attitude regarding cardiovascular diseases which is consistent with this research study where 96% of the respondents answered strongly agree and agree for doing exercise where it is almost similar with this research study where 79.6% of the respondents answered strongly agree on the statement "I should be doing exercise to maintain a healthy lifestyle" and 18.8% answered agree on the same statement where in total are 98.4% repondents answered strongly agree and agree for the same statement. According to Nystoriak, and Bhatnagar (2018) regular physical activity can improve many types of risk factors of cardiovascular diseases such as dyslipidemia or hypertension.

Another separated study where it also took place at the North-East coast of Malaysia showed the mean and standard deviation for knowledge regarding cardiovascular disease scored at 30.6 ≠ 5 with the percentage of 55.1% respondents

indicating that they are having good attitude regarding cardiovascular diseases (Ranimah, Rosediani & Harmy, 2012). In the study done by Ranimah, Rosediani and Harmy (2012), majority of the respondents agreed that they should know their level of blood cholesterol, reduce the sugar and fat intake which is consistent with this study as 48.6% and 42.0% of the respondents in this study strongly agreed and agreed that they should avoid drinking carbonated drinks as carbonated drinks usually have high content of sugar and 69.1% and 24.3% respondents in this study strongly agreed and agreed with the statement that they should take less oily food for healthy lifestyle.

In addition, a study involving students from public university in Malaysia by Mardhiah Mahada, Nor Azlina, Nor Iza and Mainul Haque (2016) where it resulted majority of the respondents in the study have showed average level of attitude towards cardiovascular diseases and its risk factors. The statement that get the highest positive respond in the study by Mardhiah Mahada, Nor Azlina, Nor Iza and Mainul Haque (2016) was "I know smoking is bad for health" where around 93.7% of the respondents answered strongly agree while in this study there are about 77.9% of the respondents answered strongly agree for the same statement. According to Center for Diseases Control and Prevention (CDC) (n.d.) stated that there will be a forming of plaque in blood vessels which is increasing by smoking thus lead to having coronary heart disease when the plaque narrows or there is a clot that block the arteries that provide blood to the heart muscle. In addition, the cigarette smoke contains chemicals that cause blood to thicken that will led to blood clot inside the veins and arteries.

Furthermore, there is also study done by foreign country such as Iran where it is exactly 70% of the respondents on the research study had a highly satisfactory attitude regarding cardiovascular diseases (Koohi & Khalili, 2020). According to Koohi and Khalili (2020), their respondents having high level of knowledge possibly due to the IraPEN program implementation in primary health centers which is a modification of the WHO Package of essential NCD (PEN) where it is a scoring tools according to a laboratory-based WHO risk score that assesses the 10-year risk pf cardiovascular diseases of anyone that had to be referred to health centers due to having various risk factors.

Another study done by Sumaira Ejaz, Muhammad Afzal, Muhammad Husain, Haira Sarwar and Syed Amir Gilani (2018) involving rural community in Pakistan showed that they are having negative attitude regarding cardiovascular diseases and its risk factors. In the survey done by Sumaira Ejaz, Muhammad Afzal, Muhammad Husain, Haira Sarwar and Syed Amir Gilani (2018) related to attitude regarding cardiovascular disease is the statement for “I can manage my stress” where 52 out of 110 respondents answered uncertain for the statement while the highest respond in this study for the same statement is 77 respondents out of 181 answered agree for the statement. There are some possibilities for the choice of answer in both of Sumaira Ejaz, Muhammad Afzal, Muhammad Husain, Haira Sarwar and Syed Amir Gilani (2018) study and this study where community in rural did not know whether they can manage their stress or not as there is a study done by Mumford, Minhas, Akhtar, Akhter and Mubbashar (2000) that take place in rural community where they stated that 25% of

the respondents from the survey done are suffering from anxiety and depressive disorder and it is increased by age. In addition, they also stated that women are getting stress when they lived in a joint household than living in unitary family household. Furthermore, Mumford, Minhas, Akhtar, Akhter and Mubbashar (2000) also stated their opinions where these conditions of getting distress is because of healthy people migrate to cities and living an urban life which they considered will be more helpful to a good mental health in Pakistan. Coincidentally, this opinion quite fit for Sumaira Ejaz, Muhammad Afzal, Muhammad Husain, Haira Sarwar and Syed Amir Gilani (2018) research study as their respondents are oversampled with women which took 70% of the population study as women are more likely to be available at home and join the research study.

5.4 Practice Regarding Cardiovascular diseases and Its Risk Factors

A study done by Nursyafiza, Nor Azlina, and Mainul Haque (2018) in the North-East coast of Malaysia shows that their respondents showed non-optimal practice regarding cardiovascular diseases. However, more than half of the respondents in the study Nursyafiza, Nor Azlina, and Mainul Haque (2018) were doing vigorous activities for more than 10 minutes which is consistent with this study where there are also half of the respondents including vigorous activity in their daily activity. According to a research study done by Tian and Meng (2019), they also take the suggestion from American Heart Association where they said the general recommended intensity of exercise for humans to prevent cardiovascular disease is 25 minutes until at least 75 minutes per week of vigorous activity where they could also separate their own vigorous activities for a day of doing some parts of 10 to 15 minutes per day.

Another separated study where it also took place at the North-East coast of Malaysia showed the respondents' practice that was still not optimal (Ranimah, Rosediani & Harmy, 2012). The respondents in the study by Ranimah, Rosediani and Harmy (2012) displayed that 15.2 % of the respondents taking fatty food less than 3 times per week which indicated that another 84.8% are taking fatty food more than 3 times per week which it will contribute in increasing risk of getting cardiovascular diseases. According to Briggs, Petersen, and Kris-Etherton (2017), their research study stated that not all fatty acids are bad for health as they are providing strong prove that in order to consume fatty foods while giving benefit to cardiovascular health, the consumer have to replace the products with saturated fatty acids to products with

unsaturated fatty acids, mono-unsaturated fatty acids and poly-unsaturated fatty acids, and carbohydrates from whole grains that rich with fibre.

In addition, a study involving students from public university in Malaysia by Mardhiah Mahada, Nor Azlina, Nor Iza and Mainul Haque (2016) where it resulted majority of the respondents in the study have poor practice regarding cardiovascular diseases and its risk factor. This is because in their study, more than half of the respondents stated that they seldom spend their leisure time to exercise. Furthermore, it is almost half of the respondents from the same study stated that they frequently took fried food as their main course which is quite consistent with this study where half of the respondents also answered that they also frequently take fried food as their main course. A study done by Abdel-Megeid, Abdelkarem, and El-Fetouh (2011) stated that the students that joined their research study as the respondents which took place in university located at Riyadh also resulted that most of the students practice unhealthy habits for eating where they often eat snacks every day and most of the students had low intake of vegetables, beans, and grain while having high intake of salty and foods rich with fat.

Furthermore, there is also study done by foreign country such as Iran where the respondents achieved sufficient practice for physical activity behavior and highly satisfactory for nutrition and smoking behavior regarding cardiovascular diseases and its risk factor (Koohi & Khalili, 2020). The study by Koohi and Khalili (2020)

consistent with another study by Vaidya, Aryal and Krettek (2013) where their respondents also showed that most of them are trying to lead a healthy lifestyle where they stated that they already have good changes and positive practices in their daily life as most of them stated that they want to feel better, they have read about information regarding cardiovascular diseases and its risk factors, the healthcare workers encourage them, for the sake of family and friends, avoid taking medications and other reasons that will be benefitting them in their life thus keep their cardiovascular healthy.

Another study done by Sumaira Ejaz, Muhammad Afzal, Muhammad Husain, Haira Sarwar and Syed Amir Gilani (2018) involving rural community in Pakistan showed they also have poor practices regarding cardiovascular diseases and its risk factors in their life. The highest proportion regarding survey related to practice is more than half of the respondents answered that they seldom and never took fruits in their diet. A study done by Zhao et. al (2017) stated that there are many supports came from experimental research study where they agreed that fruit have the protective role towards cardiovascular disease. Some types of fruits could help in regulating the metabolic risk factors such as hypertension, diabetes, obesity, inhibits atherosclerosis and others which all these risk factors could lead people of getting cardiovascular diseases.

On the other hand, a study done involving metabolic syndrome patients in India where they also showed poor practices in regards of taking care of their cardiovascular diseases and its risk factors and their research study result is inconsistent with this presence study as respondents in this study showed intermediate level of practice (Verma, Mehta, Mehta & Patyal 2019). In the study by Verma, Mehta, Mehta and Patyal (2019), the respondents more than 40 years old showed that only some of them would follow the physician's advice and only did some good practices when they felt something is not right with their body but then back to their old habit of not practicing good lifestyle practices when their body felt like in normal condition back. In this presence study, the respondents are from university students, so their practices are still not high level, but it can be the benchmarks for others to acknowledge the level of practices among them as many believes that the pandemic even of COVID-19 also plays roles in influencing themselves to practice good habit in their lives.

5.5 Relationship Between Knowledge and Attitude Towards Practice Regarding Cardiovascular Diseases and Its Risk Factors

Pearson correlation analysis in this study had showed that there is a significant relationship between knowledge on risk factors of cardiovascular diseases and its preventive measure and attitude regarding cardiovascular diseases and its risk factors towards practice regarding cardiovascular diseases and its risk factors among male undergraduates' students with non-medical and health science background in Universiti Putra Malaysia. However, the respondent of this study still shows intermediate level of practice regarding cardiovascular diseases and its risk factor where it is not highly satisfactory as they showed that they have good level of knowledge regarding cardiovascular diseases and its preventive measure and good level of attitude regarding cardiovascular diseases and its risk factors.

Even though, the respondents are having good knowledge regarding cardiovascular diseases and its preventive measures and also high level of attitude regarding cardiovascular diseases and its risk factor, their level of practice just achieved intermediate level as it may be that they have the knowledge and the appropriate attitude as they are undergraduates students but the they still have some hindrance towards practicing good habit to avoid from suffering cardiovascular diseases and having the possibility to adapt the risk factor that will lead to cardiovascular diseases.

A similar study done by Mardhiah Mahada, Nor Azlina, Nor Iza and Mainul Haque (2016) also involving Malaysian public university student showed that there was a significant association between attitude and practice while there is no significant association between knowledge and practice. Meanwhile, a study by Ranimah, Rosediani and Harmy (2012) located at the East-Coast of peninsula of Malaysia which knowledge and attitude showed strong significant of association towards practice regarding cardiovascular diseases where it is the same as this presence study.

Vaidya, Aryal, and Krettek (2013) had stated that there was a big difference between knowledge, attitude and practice and resulted poor relation between these three as they stated that is a linear association between knowledge, attitude and practice might not present in health of cardiovascular. They also stated that no general involvement that could refine every one's knowledge, attitude, and practice in a community.

5.6 Association Between Sociodemographic Background and Knowledge, Attitude and Practice regarding Cardiovascular diseases and Its Risk Factors

One-way independent ANNOVA is used to determine the association between year of study, faculty of the study population, ethnicity, and family history of cardiovascular diseases with level of knowledge regarding cardiovascular diseases and its preventive measure, attitude, and practice on cardiovascular diseases and its risk factor.

The result had showed that there is no significant association between year of study, and faculty of the study population with level of knowledge on risk factors of cardiovascular diseases and its preventive measure, attitude and practice regarding cardiovascular diseases and its risk factors. This finding is consistent with a study done by Mardhiah Mahada, Nor Azlina, Nor Iza and Mainul Haque (2016) where their study also displayed no significant association between faculty of the study population and year of study with level of attitude and practice regarding cardiovascular diseases and its risk factor and between year of study with level of knowledge regarding cardiovascular disease and its preventive measure. However, it is not consistent with another result in the same study by Mardhiah Mahada, Nor Azlina, Nor Iza and Mainul Haque (2016) where there is a significant association between faculty with level of knowledge regarding cardiovascular disease and its preventive measure.

The result had showed that there is no significant association between ethnicity and level of practice regarding cardiovascular diseases and its risk factors. This result is

consistent with a research study done by Nursyafiza, Nor Azlina, and Mainul Haque (2018) where there is no significant association between ethnicity and level of practice regarding cardiovascular disease. However, it is not consistent with another study done by Siti Munira, Mohamad Rodi, Nurhuda, Leny Suzana (2020) where there is a significant association between ethnicity with level of practice regarding cardiovascular disease and its risk factor.

The result also showed that there is significant association between ethnicity, and family history of cardiovascular diseases with level of knowledge on risk factors of cardiovascular diseases and its preventive measure and level of attitude regarding cardiovascular diseases and its risk factors. The result for this study is consistent with a study done by Nursyafiza, Nor Azlina, and Mainul Haque (2018) where there is significant association between ethnicity with level of knowledge on risk factors of cardiovascular diseases and its preventive measure. However, the same study by Nursyafiza, Nor Azlina, and Mainul Haque (2018) have different result where there is no significant association between ethnicity and level of attitude regarding cardiovascular diseases and its risk factors. There is also a study that have no significant association of family history of cardiovascular diseases with level of knowledge and level of practice regarding cardiovascular disease and its risk factor (Koohi & Khalili (2020).

The result also showed that there is significant association between family history of cardiovascular diseases with level of attitude regarding cardiovascular diseases and its risk factors. This is consistent with the study done by Koohi and Khalili (2020) where there is also significant association between family history of cardiovascular diseases with level of attitude regarding cardiovascular diseases and its risk factors.

Pearson correlation is used to determine the association between age and level of knowledge on risk factors of cardiovascular diseases and its preventive measure, attitude, and practice on cardiovascular diseases and its risk factor.

The result had showed that there is no significant association between age with level of knowledge on risk factors of cardiovascular diseases and its preventive measure and level of attitude on cardiovascular diseases and its risk factor. The result for this study is consistent with a study done by Verma, Mehta, Mehta and Patyal (2019) where there is no significant association between age with level of knowledge on risk factors of cardiovascular diseases and its preventive measure and level of attitude on cardiovascular diseases and its risk factor. However, the result of this study did not consistent with a study done by Tharu and Rawal (2021) where there is a significant association between age with level of knowledge and attitude regarding cardiovascular disease and its risk factor. A study by Koohi and Khalili (2020) resulted that there is no significant association between age and level of attitude regarding cardiovascular

diseases and its risk factor while there is a significant association between age with level of knowledge on risk factors of cardiovascular diseases and its preventive measure.

The result had showed that there is significant association between age and level of practice regarding cardiovascular diseases and its risk factors. The result for this study is consistent with a study done by Verma, Mehta, Mehta and Patyal (2019) and Siti Munira, Mohamad Rodi, Nurhuda, Leny Suzana (2020) where there is a significant association between age with level of practice regarding cardiovascular diseases and its risk factor. However, the result of this study did not consistent with a study done by Koohi and Khalili (2020) where there is no significant association between age with level of practice regarding cardiovascular disease and its risk factor.

5.7 Conclusion

In conclusion, the study had found that the mean score and standard deviation for knowledge on risk factors of cardiovascular diseases and its preventive measure in this study is 43.41 ≠ 2.92 while the mean score and standard deviation for attitude and practice regarding cardiovascular diseases and its risk factors are 55.31 ≠ 4.57 and 24.28 ≠ 3.06, respectively. The respondents showed good knowledge and high level of attitude but intermediate level of practice regarding cardiovascular diseases and its risk factors. This shows that being knowledgeable and having positive attitudes does not reflect that one will be really practice healthy habits in their life to prevent cardiovascular diseases and its risk factor.

There are many things that will affect the respondents' way of practicing the good habits in their daily lives while there are some things that need time to be practiced and difficult to be changed. Therefore, it is still important to instill the understanding and creating awareness of cardiovascular diseases and its risk factors among younger generations so that they can still work and practice healthy lifestyle on their best condition of age to prevent the cardiovascular diseases. As time goes by, there will be many improvements on their healthy lifestyle practices when they had earlier exposure regarding cardiovascular diseases and its risk factor.

CHAPTER 6: LIMITATIONS AND RECOMMENDATIONS

6.0 Introduction

This study is a cross-sectional study that had been conducted within a short period of time by using simple random sampling, stratified random sampling and convenience sampling for the data collection. Thus, there are several limitations identified during research period will be discussed in this chapter.

6.1 Limitations

Firstly, the study design used was a cross-sectional study, which only could identify the prevalence and does not allow the identification of causes and effect of the variables. Next, the number of the respondents were not evenly distributed even though I had done the stratified random sampling and allocated the desired number of the respondents according to the distribution of all the students in its respective faculty causing difficulties in making exact comparison between groups. Besides, recall bias might happened when answering the online survey leading to the underestimation or overestimation of the knowledge, attitude and practice regarding cardiovascular diseases and its risk factors among the respondents. Moreover, there is limited similar or related study about knowledge, attitude and practice regarding cardiovascular diseases and its risk factors in Malaysia. Furthermore, convenience sampling method and small sample size were recruit in this study had caused the findings of the study may not be generalized to all the students in Universiti Putra Malaysia, Selangor, and Malaysia population.

6.2 Implication and recommendation

This study had concluded that having good knowledge and high level of attitude regarding cardiovascular diseases and its risk factors does not guarantee that one's will have high level of practice in daily life. But, having the knowledges and proper attitude is still crucial to enhance the awareness regarding cardiovascular diseases to public, despite the practice is just in intermediate level. Furthermore, this data obtained does not represent all the undergraduates' students in Universiti Putra Malaysia so it is important to create more awareness regarding cardiovascular diseases and its risk factor that may affect these younger generations thus lead to more comorbidities awaiting while they are being older. The awareness program or campaign can be done directly and indirectly but it will be more effective in an organizing program which include activities that involve all possible facts and statistics and real case report related to people who have been suffering from cardiovascular diseases no matter what their age is.

Further studies should be conducted more extensively regarding factors that affect the knowledge, attitude and practice regarding cardiovascular diseases and its risk factors towards younger generation especially the undergraduates' students. This is because factors that being identified can be modified earlier for them as a precaution towards any type of cardiovascular diseases. Besides, as we lived in pandemic era where everything has been done online, less outdoor activities that can be done, changes of lifestyle and dietary consume because of economy restrictions and other unknown

external and internal factors could also affects the respondent's choice in answering the surveys.

The study of relationship between the level of knowledge on risk factors of cardiovascular diseases and its preventive measure and attitude regarding cardiovascular diseases and its risk factors towards practice regarding cardiovascular diseases and its risk factors are found to have significant relationship. This study also found that factors such as age, ethnicity, and family history of having cardiovascular diseases could affect the level of knowledge on risk factors of cardiovascular diseases and its preventive measure and attitude regarding cardiovascular diseases and its risk factors towards practice regarding cardiovascular diseases and its risk factors of the university students. The findings of this study provide an additional baseline information for the university authorities regarding the prevalence of mental health problem among their students. Also, it could help to improve the health education regarding cardiovascular diseases and its risk factors among university students.

REFERENCES

Abdel-Megeid F. Y., Abdelkarem, H. M., El-Fetouh, A. M. (2011). Unhealthy Nutritional Habits in University Students are Risk Factor for Cardiovascular Diseases. Saudi Med J 2011; Vol. 32 (6): 621-627. Retrieved from Unhealthy-Nutritional-Habits-in-University-Stu-dents-Are-Risk-Factor-for-Cardiovascular-Diseases.pdf (researchgate.net)

Aljefree, N., Ahmed. F. (2015). Prevalence of Cardiovascular Disease and Associated Risk Factors among Adult Population in the Gulf Region: A Systematic Review. Hindawi. Retrieved from https://www.hindawi.com/journals/aph/2015/235101/ DOI: https://doi.org/10.1155/2015/235101

Aminde, L. N., Takah, N., Ngwasiri, C., Noubiap, J. J., Tindong, M., Dzudie, A., Veerman, J. L. (2017). *Population awareness of cardiovascular diseases and its risk factors in Buea, Cameroon. BMC Public Health, 17(1).* Retrieved from https://doi.org/10.1186/s12889-017-4477-3

Amiri, M., Majid, H. A., Hairi, F., Thangiah, N., Bulgiba, A., Su, T. T. (2014). Prevalence and determinants of cardiovascular diseases risk factors among the residents of urban community housing projects in Malaysia. BMC Public Health. 2014;14 Suppl 3(Suppl 3): S3. Retrieved from https://pubmed.ncbi.nlm.nih.gov/25436515

Australian Institute of Health and Welfare. Cardiovascular Disease. (2020). Retrieved from https://www.aihw.gov.au/reports/heart-stroke-vascular-

diseases/cardiovascular-health-compendium/contents/how-many-australians-have-cardiovascular-disease

Awad, A., Al-Nafisi, H. (2014). Public knowledge of cardiovascular diseases and its risk factors in Kuwait: a cross-sectional survey. *BMC Public Health* **14,** 1131 https://doi.org/10.1186/1471-2458-14-1131

Bairey, Merz, C. N., Andersen, H., Sprague, E., Burns, A., Keida, M., Walsh, M. N., Greenberger, P., Campbell, S., Pollin, I., McCullough, C., Brown, N., Jenkins, M., Redberg, R., Johnson, P., Robinson, B. (2017). Knowledge, Attitudes, and Beliefs Regarding Cardiovascular diseases in Women: The Women's Heart Alliance. *Journal of the American College of Cardiology*. 70(2):123-132. Retrieved from Knowledge, Attitudes, and Beliefs Regarding Cardiovascular diseases in Women: The Women's Heart Alliance - ScienceDirect

Batacan, R. B., Duncan, M. J., Dalbo, V. J., Tucker, P. S., Fenning, A. S. (2015). BioMed Research International. Article ID 596367. Hindawi Publishing Corporation. Retrieved from http://dx.doi.org/10.1155/2015/596367

Briggs, M. A., Petersen, K. S., & Kris-Etherton, P. M. (2017). Saturated Fatty Acids and Cardiovascular Disease: Replacements for Saturated Fat to Reduce Cardiovascular Risk. Healthcare (Basel, Switzerland), 5(2), 29. https://doi.org/10.3390/healthcare5020029

Byrne, B. M. (2010). Structural equation modeling with AMOS: Basic concepts, applications, and programming. New York: Routledge.

Cardiovascular Diseases (2018). National Health Services (NHS) United Kingdom. Retrieved from https://www.nhs.uk/conditions/cardiovascular-disease/

Centers for Disease Control and Prevention. (2020). Heart Diseases Facts. Retrieved from https://www.cdc.gov/heartdisease/facts.htm

Chang, C. T., Lee, P. Y., & Cheah, W. L. (2012). The prevalence of cardiovascular risk factors in the young and middle-aged rural population in Sarawak, Malaysia. *The Malaysian journal of medical sciences: MJMS*, *19*(2), 27–34. Retrieved from https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3431746/#b3-mjms-19-2-027

Chastin, Sebastien, F. M., De Craemer, M., De Cocker, K., Powell, L., Van Cauwenberg, J., Dall, P., Hamer, M., Stamatakis, E., Sebastien, D., Chastin, F. M. (2019). How does light-intensity physical activity associate with adult cardiometabolic health and mortality? Systematic review with meta-analysis of experimental and observational studies. Br J Sports Med 53:370–376. Retrieved from DOI: 10.1136/bjsports-2017-097563

Collins COBUILD Advanced English Dictionary (2020). Attitude. HarperCollins Publishers. Retrieved from https://www.collinsdictionary.com/dictionary/english/attitude

Collins COBUILD Advanced English Dictionary (2020). Practice. Retrieved from https://www.collinsdictionary.com/dictionary/english/practice#:~:text=variable%20noun,these%20periods%20of%20doing%20something.

Collins COBUILD Advanced English Dictionary (2020). Undergraduate. Retrieved from https://www.collinsdictionary.com/dictionary/english/undergraduate#:~:text=(%

CA%8Cnd%C9%99%CA%B3gr%C3%A6d%CA%92u%C9%99t%20),the%20brightest%20in%20the%20university.

Collins English Dictionary (2020). Risk Factor. HarperCollins Publishers. Retrieved from https://www.collinsdictionary.com/dictionary/english/risk-factor

Colllins COBUILD Advanced English Dictionary (2020). Knowledge. HarperCollins Publishers. https://www.collinsdictionary.com/dictionary/english/knowledge

Dehghani, M. R., Hayat, A. A., Kojuri, J., Esmi, K. (2015). Role of organizational citizenship behavior in promoting knowledge sharing. Journal of Health Man & Info. 2(4):126-131. Retrieved from https://applications.emro.who.int/imemrf/J_Health_Manag_Inform/J_Health_Manag_Inform_2015_2_4_126_131.pdf

Department of Statistic Malaysia. (2020). Statistics on Cause of Death, Malaysia, 2020. Retrieved from https://www.dosm.gov.my/v1/index.php?r=column/cthemeByCat&cat=401&bul_id=QTU5T0dKQ1g4MHYxd3ZpMzhEMzdRdz09&menu_id=L0pheU43NWJwRWVSZklWdzQ4TlhUUT09

Dobronte, A. (2013). The importance of socio-demographics in online surveys. Retrieved from https://www.checkmarket.com/blog/socio-demographics-online-surveys/. Retrieved from DOI: 10.1186/1471-2458-14-S3-S3

Griffin, M. M., Steinbrecher, T. D. (2013). Large-Scale Datasets in Special Education Research International Review of Research in Developmental Disabilities. 45 (155-183). Retrieved from https://doi.org/10.1016/B978-0-12-407760-7.00004-9

Go, A. S., Mozaffarian, D., Roger, V. L., Benjamin, E. J., Berry, J. D., Borden, W. B., Bravata, D. M., Dai, S., Ford, E. S., Fox, C. S., Franco, S., Fullerton, H. J., Gillespie, C., Hailpern, S. M., Heit, J. A., Howard, V. J., Huffman, M. D., Kissela, B. M., Kittner, S. J., Lackland, D. T., Lichtman, J. H., Lisabeth, L. D., Magid, D., Marcus, G. M., Marelli, A., Matchar, D. B., McGuire, D. K., Mohler, E. R., Moy, C. S., Mussolino, M. E., Nichol, G., Paynter, N. P., Schreiner, P. J., Sorlie, P. D., Stein, J., Turan, T. N., Virani, S. S., Wong, N. D., Woo, D., Turner, M. B. (2013). American Heart Association Statistics Committee and Stroke Statistics Subcommittee. Heart disease and stroke statistics—2013 update: a report from the American Heart Association.Circulation.127: 6-245. Retrieved from https://www.heart.org/idc/groups/heart-public/@wcm/@sop/@smd/documents/downloadable/ucm_319577.pdf

Heart Disease (2019). National Center for Chronic Disease Prevention and Health Promotion, Division for Heart Disease and Stroke Prevention. Retrieved from https://www.cdc.gov/heartdisease/risk_factors.htm

Institute for Public Health (IPH), National Institutes of Health, Ministry of Health Malaysia. 2020. [Online]National Health and Morbidity Survey (NHMS) 2019: Vol. I: NCDs – Non-Communicable Diseases: Risk Factors and other Health Problems. Retrieved from http://iku.moh.gov.my/images/IKU/Document/REPORT/NHMS2019/Report_NHMS2019-NCD_v2.pdf

Koohi, F., Khalili, D. (2020). Knowledge, Attitude, and Practice Regarding Cardiovascular diseasesin Adults Attending Health Care Centers in Tehran, Iran.

*International Journal of Endocrinology and Metabolism.*18(3): e101612. Retrieved from doi: 10.5812/ijem.101612.

Mardhiah, Mahada, I., Nor Azlina, A. R., Nor Iza A. R., Mainul Haque H. (2016). Knowledge, Attitude and Practice of Malaysian Public University Students on Risk Factors for Cardiovascular diseasess. *Journal of Applied Pharmaceutical Science.* 6 (02), pp. 056-063. Retrieved from https://www.japsonline.com/admin/php/uploads/1774_pdf.pdf

Ministry of Health Malaysia (2017). Primary & Secondary Prevention of Cardiovascular diseases 2017. Retrieved from https://www.moh.gov.my/moh/resources/Penerbitan/CPG/CARDIOVASCULAR/3.pdf

Ministry of Health Malaysia. (2020). Report of The Impact of Noncommunicable Diseases and Their Risk Factors on Malaysia's Gross Domestic Product. [Online] Retrieved from https://www.moh.gov.my/index.php/pages/view/1904?mid=648

Mohammad, N. B., Haque, M. (2018). Knowledge, Attitude, and Practice Regarding the Risk of Cardiovascular diseases in Patients Attending Outpatient Clinic in Kuantan, Malaysia. *Journal of Pharmacy and Bioallied Health [Online]*. Retrieved from https://www.jpbsonline.org/text.asp?2018/10/1/7/227678

Mohammadnezhad, M., Mangum, T., May, W., Lucas, J.J. and Ailson, S. (2016) Common Modifiable and Non-Modifiable Risk Factors of Cardiovascular diseases (CARDIOVASCULAR DISEASESS) among

Pacific Countries. World Journal of Cardiovascular Surgery, 6, 153-170. Retrieved from http://dx.doi.org/10.4236/wjcs.2016.611022

Mohammadreza, A., Hazreen, A. M., Fariah, M. H., Nithiah, T., Awang B., Su, T. T. (2014). Prevalence and determinants of cardiovascular diseases risk factors among the residents of urban community housing projects in Malaysia. *BMC Public Health*. 14.S3. Retrieved from https://doi.org/10.1186/1471-2458-14-S3-S3

Muhihi, A. J., Anaeli, A., Mpembeni, R. N. M., Sunguya, B. F., Leyna, G., Kakoko, D., Kessy, A. T., Sando, M. M., Njelekela, M., Urassa, D. P. (2020). Public Knowledge of Risk Factors and Warning Signs For Cardiovascular diseases Among Young And Middle-Aged Adults In Rural Tanzania. *BMC Public Health.* 20(1). Retrieved from doi:10.1186/s12889-020-09956-z

Mumford, D. B., Minhas, F. A., Akhtar, I, Akhter, S., Mubbashar, M. H. (2000). Stress and psychiatric disorder in urban Rawalpindi: Community survey. British Journal of Psychiatry, 177, 557-562. Retrieved from http://ovidsp.ovid.com/ovidweb.cgi?T=JS&PAGE=reference&D=ovftd&NEWS=N&AN=00002405-200012000-00016.

Murtagh, E. M., Murphy, M. H., & Boone-Heinonen, J. (2010). Walking: the first steps in cardiovascular disease prevention. Current opinion in cardiology, 25(5), 490–496. Retrieved from https://doi.org/10.1097/HCO.0b013e32833ce972

Nursyafiza, M., Nor Azlina, A. R., Mainul Haque, H. (2018). Knowledge, attitude, and practice regarding the risk of cardiovascular diseasesin patients attending outpatient clinic in Kuantan, Malaysia. *Journal of Pharmacy and Bioallied*

Health [Online]. 10 (1): 7-14. Retrieved from https://www.jpbsonline.org/article.asp?issn=0975-7406;year=2018;volume=10;issue=1;spage=7;epage=14;aulast=Mohammad#ref16

Nystoriak, M. A., & Bhatnagar, A. (2018). Cardiovascular Effects and Benefits of Exercise. *Frontiers in cardiovascular medicine, 5*, 135. Retrieved from https://doi.org/10.3389/fcvm.2018.00135

Oxford Learner's Dictionaries. (2020). Awareness. Retrieved from https://www.oxfordlearnersdictionaries.com/definition/english/awareness

Pal, S. (2020). Prevalence of cardiovascular disease in adults. Retrieved from https://www.uspharmacist.com/article/prevalence-of-cardiovascular-disease-in-adults PMID: 22691743.

Ranimah, Y., Rosediani, M., Harmy, M. Y. (2012). Association between Knowledge, Attitude and Practice on Cardiovascular diseases among Women in Kelantan, Malaysia. *International Journal of Collaborative Research on Internal Medicine & Public Health*. 4(1): 85-98. Retrieved from https://www.researchgate.net/publication/220018185_Knowledge_Attitude_and_Practice_on_Cardiovascular_Disease_among_Women_in_North Eastcoast_Malaysia

Sadeghimoghaddam, S., Alavi, M., Mehrabi, T., & Bankpoor-Fard, A. (2019). The Effect of Two Methods of Relaxation and Prayer Therapy on Anxiety and Hope in Patients with Coronary Artery Disease: A Quasi-Experimental Study. Iranian

journal of nursing and midwifery research, 24(2), 102–107. Retreievd from https://doi.org/10.4103/ijnmr.IJNMR_60_18

Salahshoori, A., Nasirzadeh, M., Haruni, J., Pourhaji, F., Salahshoori, S., Nozarpoor, J. (2015). The Knowledge, Attitude, and Practice (KAP) of Women Health Services Staff About Risk Factors of Cardiovascular diseasess (CARDIOVASCULAR DISEASESSs) in City of Fereydan and Chadegan, Iran, Jundishapur J Chronic Dis Care. 4(1): e26599. Retrieved from 10.5812/jjcdc.26599

Seyed Said Mazloomy, Mohammad Hosein Baghianimoghadam, Mohammad Hasan Ehrampoush, Behnam Baghianimoghadam, Maysam Mazidi & Mohammad Reza Mozayan (2014). A Study of the Knowledge, Attitudes, and Practices (KAP) of the Women Referred to Health Centers for Cardiovascular diseases (CARDIOVASCULAR DISEASESSs) and Their Risk Factors. *Health Care for Women International*. 35:1, 50-59. DOI: 10.1080/07399332.2012.755980

Shrestha, M., Pyakurel, P., Yadav, K. P., Singh, S., Priyadarshini, S., Rajak, B., Sinha A., Aprajita, A., Kumari, I., Jha, N. M., Prassan, N., Tripathi, S., Banerjee, S., Shaurya, S., Ghimire, A. (2020). Knowledge, Attitude and Practices regarding Cardiovascular diseasesamong people of Pakhribas municipality of Eastern Nepal: A mixed method study. Nepalese Heart Journal. Vol 17 (1), 33-3. Retrieved from https://doi.org/10.3126/njh.v17i1.28806

Siti, Munira, Y., Mohamad, Rodi, I., Nurhuda, I., Leny, Suzana, S. (2020). The Relationship Between Socioeconomic Status and Knowledge on Cardiovascular

Risk Factors and Its Preventive Practices Among Urban Dwellers in Selangor, Malaysia. Malaysian Journal of Public Health Medicine 20(Special1):292-298. Retrieved from DOI: 10.37268/mjphm/vol.20/no.Special1/art.733

Smoking and Cardiovascular Diseases (n.d.). Center for Diseases Control and Prevention. Retrieved from https://www.cdc.gov/tobacco/data_statistics/sgr/50th-anniversary/pdfs/fs_smoking_CVD_508.pdf

Stankute, I., Dobrovolskiene, R., Danyte, E., Razanskaite-Virbickiene, D., Jasinskiene, E., Mockeviciene, G., Marciulionyte, D., Schwitzgebel, V. M., Verkauskiene, R. (2019). Factors Affecting Cardiovascular Risk in Children, Adolescents, and Young Adults with Type 1 Diabetes. Journal of Diabetes. Retrieved from https://doi.org/10.1155/2019/9134280

Sumaira Ejaz, Muhammad Afzal, Muhammad Hussain, Hajra Sarwar, Syed Amir Gilani. (2018). Knowledge, Attitude and Practice Regarding Modifiable Risk Factors of Cardiovascular diseases among Adults in Rural Community, Lahore. Int. J. Soc. Sc. Manage. 5(3): 76-82. Retrieved from DOI: 10.3126/ijssm.v5i3.19902

Tharu, R., Rawal, S. (2021). Assessment of Knowledge and Attitude Regarding Risk Factors of Cardiovascular Disease among General People Residing in Nepalgunj, Banke, Nepal. American Journal of Public Health Research 9(4):130-141. Retrieved from DOI: 10.12691/ajphr-9-4-2

Tian, D., & Meng, J. (2019). Exercise for Prevention and Relief of Cardiovascular Disease: Prognoses, Mechanisms, and Approaches. Oxidative medicine and cellular longevity, 2019, 3756750. https://doi.org/10.1155/2019/3756750

Vaidya, A., Aryal, U. R., & Krettek, A. (2013). Cardiovascular Health Knowledge, Attitude and Practice/Behaviour in An Urbanising Community of Nepal: A Population-Based Cross-Sectional Study from Jhaukhel-Duwakot Health Demographic Surveillance Site. *BMJ open*, *3*(10), e002976. Retrieved from https://doi.org/10.1136/bmjopen-2013-002976

Verma, A., Mehta, S., Mehta, A., & Patyal, A. (2019). Knowledge, attitude, and practices toward health behavior and cardiovascular diseases risk factors among the patients of metabolic syndrome in a teaching hospital in India. *Journal of family medicine and primary care*, *8*(1), 178–183. Retrieved from https://doi.org/10.4103/jfmpc.jfmpc_257_18

Wang, X., Cheng, Z. (2020). Cross-Sectional Studies: Strengths, Weaknesses, and Recommendations. Chest. 158:1.65-71. Retrieved from https://www.sciencedirect.com/science/article/pii/S0012369220304621#:~:text=The%20main%20strength%20of%20cross,of%20multiple%20exposures%20and%20outcomes.

Wilkins, E., Wilson, L., Wickramasinghe, K., Bhatnagar, P., Leal, J., Luengo-Fernandez, R., Burns, R., Rayner, M., Townsend, N. (2017). [Online]European Cardiovascular diseases Statistics 2017. European Heart Network, Brussels. Retrieved from http://www.ehnheart.org/images/CARDIOVASCULAR DISEASESS-statistics-report-August-2017.pdf

Winham, D. M., & Jones, K. M. (2011). Knowledge of young African American adults about heart disease: a cross-sectional survey. BMC public health, 11, 248. Retrieved from https://doi.org/10.1186/1471-2458-11-248

World Health Organization (2021). Cardiovascular diseases (CARDIOVASCULAR DISEASES). [Online] Retrieved from https://www.who.int/en/news-room/fact-sheets/detail/cardiovascular-diseases-(cardiovascular diseasesss)

World Health Organization. (2018). Noncommunicable Disease. [Online] Retrieved from https://www.who.int/news-room/fact-sheets/detail/noncommunicable-diseases

Yunus, A. M., Sherina, M., Nor Afiah, M., Rampal, L., Tiew, Kh. (2004). Prevalence Of Cardiovascular Risk Factors in A Rural Community in Mukim Dengkil, Selangor. Malays J Nutr. 2004 Mar;10(1):5-11. Epub. Retrieved from https://pubmed.ncbi.nlm.nih.gov/22691743/

Zhao, C. N., Meng, X., Li, Y., Li, S., Liu, Q., Tang, G. Y., & Li, H. B. (2017). Fruits for Prevention and Treatment of Cardiovascular Diseases. Nutrients, 9(6), 598. https://doi.org/10.3390/nu9060598

Zubair, F., Nawaz, Syed, S. K., Nawaz, A., Nangyal, H., Amjad, N., Khan, M. S. (2018). Prevalence of cardiovascular diseases in Punjab, Pakistan: a cross-sectional study. Journal of Public Health. 26(5). Retrieved from https://www.researchgate.net/publication/322830792_Prevalence_of_cardiovascular_diseases_in_Punjab_Pakistan_a_cross-sectional_study DOI: 10.1007/s10389-018-0898-4

APPENDICES

APPENDIX 1: INFORMED SHEET

KNOWLEDGE, ATTITUDE AND PRACTICE REGARDING CARDIOVASCULAR DISEASES AND ITS RISK FACTORS AMONG MALE UNDERGRADUATE STUDENTS WITH NON-MEDICAL AND HEALTH SCIENCE BACKGROUND IN UNIVERSITI PUTRA MALAYSIA.

Assalamualaikum and a very good day to everyone, I am Nur Hidayatulhusna Binti Zuraimi, a final year student of Bachelor of Nursing from Faculty of Medicines and Health Sciences UPM. I'm currently conducting a final year project of Knowledge, Attitude and Practice Regarding Cardiovascular Diseases and Its Risk Factors among Male Undergraduate Students with Non-Medical and Health Science Background in Universiti Putra Malaysia. Please read the following information carefully.

INTRODUCTION: Cardiovascular diseases have been constantly being the leading causes of death in Malaysia. Even though older population is more susceptible towards cardiovascular disease, there is also high chances for the younger generation to get cardiovascular diseases if many of them is still not aware of the risk factors of cardiovascular disease especially male population. This study will be conducted to identify the level of knowledge, attitude and practice regarding cardiovascular disease and its risk factors among male undergraduate students with non-medical background.

INSTRUCTION: This questionnaire consist of 4 sections, Section A (Socio-Demographic), Section B (Knowledge on Risk Factors of Cardiovascular Diseases and Its Preventive Measure), Section C (Attitude Regarding Risk Factors of Cardiovascular Diseases) and Section D (Practice Regarding Risk Factors of Cardiovascular Diseases). You are required to answer all the questions in the sections and take approximately 10-15 minutes.

WHO SHOULD NOT PARTICIPATE IN THIS STUDY?

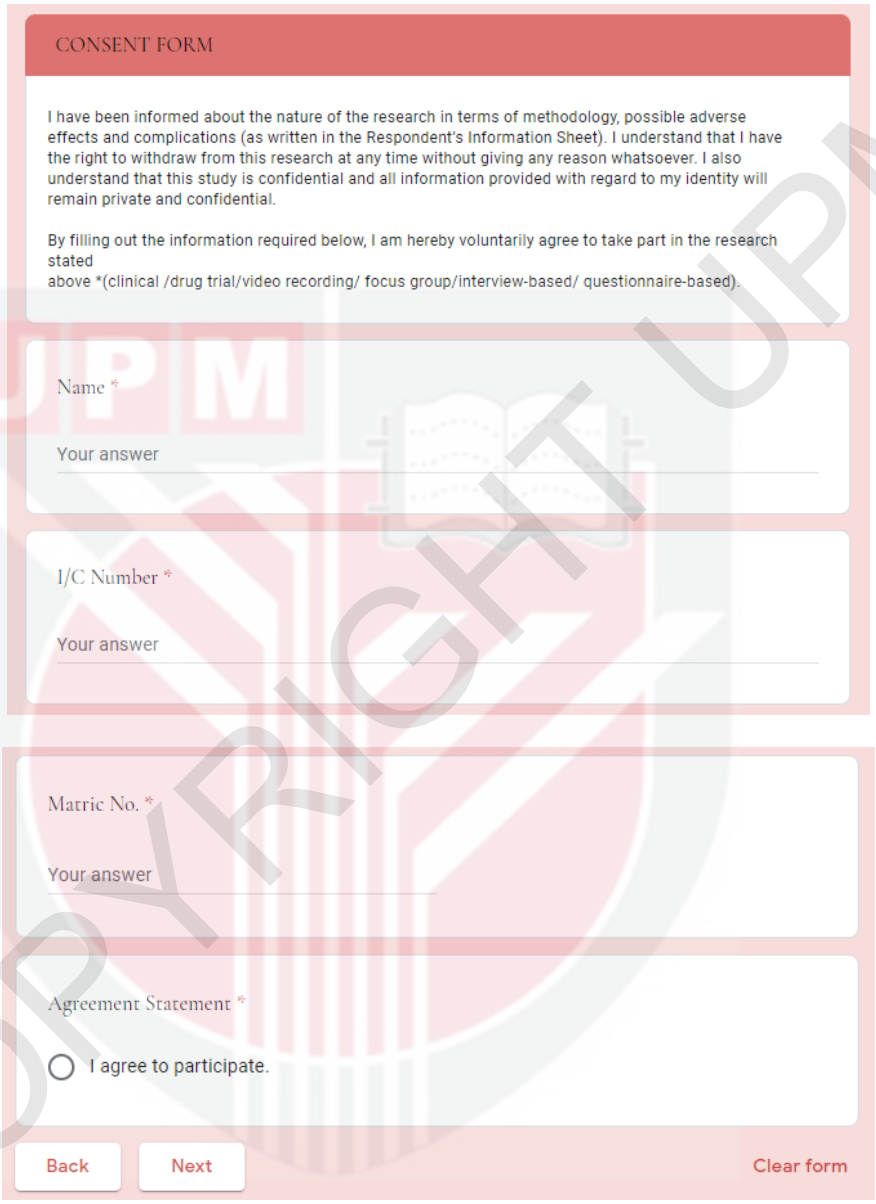
1. Suffering from Cardiovascular Diseases (i.e.: Coronary heart disease, stroke, transient ischemic attack,
   peripheral arterial disease, and aortic disease)
2. Non-Malaysian citizen or Foreigner
3. Undergraduate students from Faculty of Medicine and Health Science
4. Post-graduate students
5. Foundation students
6. Students on defer their study and on long medical leave

INFORMATION CONFIDENTIALLY: All of the information is confidential. The information obtained from respondents will only be used for the research purpose and handled in a confidential manner. Any identifiable information collected will be kept in a registry file and will be kept in a secured and password protected or cloud storage system and can only be accessed by the researcher and the supervisor.

If you have any queries about this study, please contact:
Nur Hidayatulhusna Binti Zuraimi (011-14448437) - 194732@student.upm.edu.my
Hng Siew Hong (016-6861868) - hngsiewhong@upm.edu.my

Your participation in this study will be much appreciated. Thank you!

APPENDIX 2: INFORMED CONSENT FORM



CONSENT FORM

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

By filling out the information required below, I am hereby voluntarily agree to take part in the research stated
above *(clinical /drug trial/video recording/ focus group/interview-based/ questionnaire-based).

Name *

Your answer

I/C Number *

Your answer

Matric No. *

Your answer

Agreement Statement *

I agree to participate.

Back Next Clear form

APPENDIX 3: QUESTIONNAIRE

Questionnaire on Knowledge, Attitude and Practice Regarding Cardiovascular Diseases and Its Risk Factors

Section I: Demographic Data

Age:	
Year of Study	
1. Year 1	2. Year 3
3. Year 2	4. Year 4
5. Year 5	
Faculty:	
1. Faculty of Modern Languages and Communications	2. Faculty of Forestry
3. Faculty of Human Ecology	4. Faculty of Engineering
Ethnicity:	
1. Malay	2. Chinese
3. Indian	4. Kadazan
5. Bidayuh	6. Bajau
7. Kedayan	8. Iban.
9. Lun Bawang	10. Others
Family history of Cardiovascular diseases (CVD):	
1. Father	2. Mother
3. Siblings	4. Others
Type of Cardiovascular diseases (CVD) from family history:	
1. Heart attack	2. Hypertension
3. Diabetes	4. Stroke
5. Others	

Section II: Knowledge Regarding Cardiovascular Diseases and Its Preventive Measures

No.	Statements	True	False	Don't Know
1	Cardiovascular diseases are the leading cause of death in Malaysia.	3	1	2
2	Light walking is a preventive factor for cardiovascular diseases.	3	1	2
3	Adequate exercise can prevent cardiovascular diseases.	3	1	2
4	Eating fruits or vegetables can prevent form cardiovascular diseases.	3	1	2
5	Most cardiovascular diseases cases are hereditary.	3	1	2
6	Controlling high fat food consumption is essential.	3	1	2
7	Cardiovascular diseases is a disease that is related to heart.	3	1	2
8	Cardiovascular diseases is a disease that is related to blood vessels.	3	1	2
9	Tobacco cessation programs are available in your hometown.	3	1	2
10	Irregular eating patterns has no harm to your health.	3	1	2
11	Cardiovascular diseases are the disease of women only.	3	1	2
12	Doing housework as an exercise is enough for a day.	3	1	2
13	If you have a slim body, you do not need to exercise.	3	1	2
14	Cardiovascular diseases can occur to young people.	3	1	2
15	High density lipoprotein (HDL) is a good type of cholesterol.	3	1	2
16	Body Mass Index (BMI) more than 30 is considered as obese.	3	1	2
17	Prayer can help to reduce stress	3	1	2

Section III: Attitude on Cardiovascular Diseases and Its Risk Factors

No.	Statements	SD	D	U	A	SA
1	I should be doing exercise to maintain a healthy lifestyle.	1	2	3	4	5
2	If I need to go to places somewhere near, I choose to walk rather than taking any other mean of transportation (E.g., Going to class or café).	1	2	3	4	5
3	I know smoking is bad for health.	1	2	3	4	5
4	I should maintain my weight according to my Body Mass Index (BMI).	1	2	3	4	5
5	I should take less oily food for healthy lifestyle.	1	2	3	4	5
6	I prefer to play with my laptop instead of doing exercise.	1	2	3	4	5
7	I read the nutrition information of each product that I intended to buy.	1	2	3	4	5
8	I choose to eat or buy fast food when going out with friends.	1	2	3	4	5
9	I can manage my stress	1	2	3	4	5
10	I should avoid drinking carbonated drinks.	1	2	3	4	5
11	Sometimes, I eat supper late at night before sleep.	1	2	3	4	5

SD=Strongly Disagree, D=Disagree, Uncertain, A=Agree, SA=Strongly Agree

Section III: Attitude on Cardiovascular Diseases and Its Risk Factors

No.	Statements	SD	D	U	A	SA
12	I believe walking a lot can give benefits to my health.	1	2	3	4	5
13	I should take fruit or vegetable in my diet for maintaining my health.	1	2	3	4	5
14	I should control my stress to avoid from getting any disease.	1	2	3	4	5

SD=Strongly Disagree, D=Disagree, Uncertain, A=Agree, SA=Strongly Agree

Section IV: Practice on Cardiovascular Diseases and Its Risk Factors

No.	Statements	Always	Frequently	Seldom	Never
1	Do you take any supplement or special diet? (E.g., Evening Primrose Oil, Oat diet, etc.)	1	2	3	4
2	Does your daily activity involve vigorous activity? (E.g., heavy lifting, digging)	1	2	3	4
3	Do you walk for at least 10 minutes to get toand from places? (E.g., from café, classes, mosques, etc.)	1	2	3	4
4	Do you spend your leisure time to exercise atleast 20 minutes per session?	1	2	3	4
5	How often do you take fruits in your diet?	1	2	3	4
6	How often do you take vegetables in your diet?	1	2	3	4
7	How often do you eat fast food?	1	2	3	4
8	Do you like to eat in between main meals? (E.g.,snacking, eating biscuits, etc.)	1	2		4
9	Do you take fried food as your main course?	1	2	3	4
10	Do you lead a stressful life?	1	2	3	4

APPENDIX 4: APPROVAL LETTER FROM JKEUPM

Ref. no: UPM/TNCPI/RMC/JKEUPM/1.4.18.2 (JKEUPM)
Date: 2 April 2021

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

APPLICATION FOR JKEUPM ETHICAL CLEARANCE: APPROVED

With reference to the above, I am pleased to inform you that your application for ethical clearance for the research project entitled '**Knowledge, Attitude and Practice Regarding Cardiovascular Diseases and its Risk Factors among Male Undergraduate Students with Non-Medical and Health Science Background in Universiti Putra Malaysia**' has been approved.

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

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

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

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

Note: Please use this reference number for any transaction.

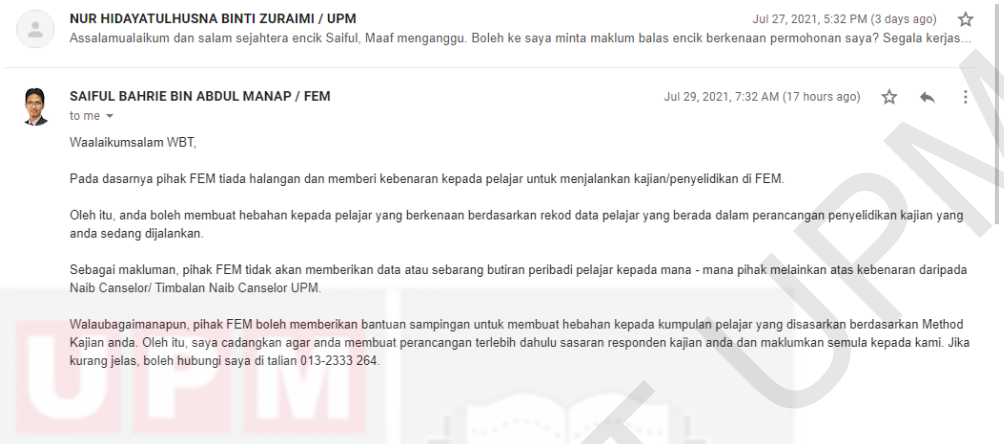
- **JKEUPM-2021-068**

Thank you.

Yours faithfully,

Prof. Dr. Zamberi Sekawi
Chair
Ethics Committee for Research Involving Human Subjects
Universiti Putra Malaysia

APPENDIX 5: APPROVAL FROM FACULTY INVOLVED



NUR HIDAYATULHUSNA BINTI ZURAIMI / UPM Jul 27, 2021, 5:32 PM (3 days ago)
Assalamualaikum dan salam sejahtera encik Saiful, Maaf menganggu. Boleh ke saya minta maklum balas encik berkenaan permohonan saya? Segala kerjas...

SAIFUL BAHRIE BIN ABDUL MANAP / FEM Jul 29, 2021, 7:32 AM (17 hours ago)
to me

Waalaikumsalam WBT,

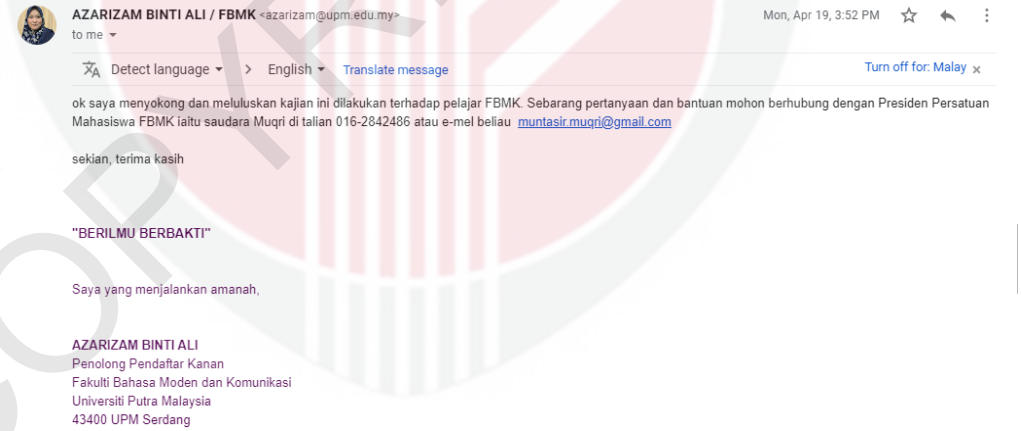
Pada dasarnya pihak FEM tiada halangan dan memberi kebenaran kepada pelajar untuk menjalankan kajian/penyelidikan di FEM.

Oleh itu, anda boleh membuat hebahan kepada pelajar yang berkenaan berdasarkan rekod data pelajar yang berada dalam perancangan penyelidikan kajian yang anda sedang dijalankan.

Sebagai makluman, pihak FEM tidak akan memberikan data atau sebarang butiran peribadi pelajar kepada mana - mana pihak melainkan atas kebenaran daripada Naib Canselor/ Timbalan Naib Canselor UPM.

Walaubagaimanapun, pihak FEM boleh memberikan bantuan sampingan untuk membuat hebahan kepada kumpulan pelajar yang disasarkan berdasarkan Method Kajian anda. Oleh itu, saya cadangkan agar anda membuat perancangan terlebih dahulu sasaran responden kajian anda dan maklumkan semula kepada kami. Jika kurang jelas, boleh hubungi saya di talian 013-2333 264.

Faculty of Human Ecology



AZARIZAM BINTI ALI / FBMK <azarizam@upm.edu.my> Mon, Apr 19, 3:52 PM
to me

Detect language > English Translate message Turn off for: Malay

ok saya menyokong dan meluluskan kajian ini dilakukan terhadap pelajar FBMK. Sebarang pertanyaan dan bantuan mohon berhubung dengan Presiden Persatuan Mahasiswa FBMK iaitu saudara Muqri di talian 016-2842486 atau e-mel beliau muntasir.muqri@gmail.com

sekian, terima kasih

"BERILMU BERBAKTI"

Saya yang menjalankan amanah,

AZARIZAM BINTI ALI
Penolong Pendaftar Kanan
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Universiti Putra Malaysia
43400 UPM Serdang

Faculty of Modern Language and Communication

APPENDIX 6: GANTT CHART

PROJECT ACTIVITIES	YEAR	2020		2021								
		N	D	J	F	M	A	M	J	J	A	S
Project implementation plan write up												
Ethics application												
Conducting pilot study												
Data collection												
Data analysis												
Writing research report												
Final presentation												

APPENDIX 7: RESEARCH BUDGET

ITEM	PRICE PER UNIT (RM)	ESTIMATED COST
Printing (Thesis)	50	RM 50.00
Binding	20	RM 20.00
Calls and Internet Data	200	RM 200.00