



UNIVERSITI PUTRA MALAYSIA

***KNOWLEDGE AND AWARENESS TOWARDS COLORECTAL CANCER
SCREENING AMONG STAFF IN THE FACULTY OF MEDICINE AND HEALTH
SCIENCES, UNIVERSITI PUTRA MALAYSIA***

FARHANI BINTI MOHD FAUZI

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AMONG STAFF IN THE FACULTY OF MEDICINE AND HEALTH SCIENCES,
UNIVERSITI PUTRA MALAYSIA**

FARHANI BINTI MOHD FAUZI

DEPARTMENT OF NURSING

FACULTY OF MEDICINE AND HEALTH SCIENCES

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SEPTEMBER 2021



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FARHANI BINTI MOHD FAUZI

**Thesis Submitted to the Faculty of Medicine and Health Sciences, Universiti Putra
Malaysia, in Fulfillment of the Requirements for the Degree of Bachelor in Nursing**

SEPTEMBER 2021

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ABSTRACT**KNOWLEDGE AND AWARENESS TOWARDS COLORECTAL CANCER SCREENING
AMONG STAFF IN THE FACULTY OF MEDICINE AND HEALTH SCIENCES,
UNIVERSITI PUTRA MALAYSIA****Farhani, M. F., Rosna, A. R., Ruthpackiavathy, R. D.***Department of Nursing, Faculty of Medicines and Health Sciences,
Universiti Putra Malaysia*

Introduction: Colorectal cancer was the third most common cancer in men and women. Early screening was important for the early detection and prevention of developing colorectal cancer.

Objective: This study aimed to determine the level of knowledge and awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

Method: A cross-sectional study was conducted by using a self-administered, validated and, pretested questionnaire. The Statistical Package for the Social Sciences (SPSS) version 22.0 was used for data entry and analysis. Mean (standard deviation), frequency and percentage were used as descriptive analysis. One Way Independent ANOVA was used to determine the association between knowledge and awareness towards colorectal cancer screening.

Results: The mean age of the respondents were 39.340 ± 6.328 . Majority of respondents were female (70%), Malay (81%) and received Diploma (43%). More than half of them had good knowledge and awareness towards colorectal cancer screening. One Way Independent ANOVA showed a significant value between knowledge and awareness towards colorectal cancer screening with p-value 0.001. **Conclusion:** More than half of the respondents had good knowledge and awareness about the warning signs, the risk factors and the screening tests for colorectal cancer. Hence, promoting colorectal cancer screening through programs and campaigns was needed to enhance awareness of colorectal cancer screening and to reduce the incidence of cases of colorectal cancer.

Keywords: Knowledge, awareness, colorectal cancer screening, university staff

ABSTRAK**PENGETAHUAN DAN KESEDARAN TERHADAP SARINGAN KANSER
KOLOREKTAL DALAM KALANGAN KAKITANGAN DI FAKULTI PERUBATAN
DAN SAINS KESIHATAN, UNIVERSITI PUTRA MALAYSIA****Farhani, M. F., Rosna, A. R., Ruthpackiavathy, R. D.***Jabatan Kejururawatan, Fakulti Perubatan dan Sains Kesihatan,**Universiti Putra Malaysia*

Pengenalan: Kanser kolorektal adalah kanser yang paling biasa pada lelaki dan wanita. Saringan awal penting untuk pengesanan awal dan pencegahan kanser kolorektal. **Objektif:** Kajian ini bertujuan untuk mengenalpasti tahap pengetahuan dan kesedaran terhadap saringan kanser kolorektal dalam kalangan kakitangan di Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia. **Cara:** Kajian rentas dijalankan dengan menggunakan soal selidik yang dikendalikan sendiri, disahkan dan yang telah diuji. Pakej Statistik untuk Sains Sosial (SPSS) versi 22.0 digunakan untuk kemasukan dan analisis data. Min (sisihan piawai), frekuensi dan peratusan digunakan sebagai analisis deskriptif. ANOVA Bebas Sehalu digunakan untuk mengenalpasti pengetahuan dan kesedaran terhadap saringan kanser kolorektal dalam kalangan responden. **Hasil kajian:** Umur min responden adalah 39.340 ± 6.328 . Majoriti responden adalah wanita (70%), Melayu (81%) dan mendapat Diploma (43%). Lebih separuh daripada mereka mempunyai pengetahuan dan kesedaran yang baik terhadap saringan kanser kolorektal. ANOVA Bebas Sehalu menunjukkan nilai yang signifikan antara pengetahuan dan kesedaran terhadap saringan kanser kolorektal dengan nilai $p < 0.001$. **Rumusan:** Lebih daripada separuh responden mempunyai pengetahuan dan kesedaran yang baik mengenai tanda amaran, faktor risiko dan ujian saringan untuk kanser kolorektal. Oleh itu, mempromosikan saringan kanser kolorektal melalui program dan kempen diperlukan untuk meningkatkan kesedaran mengenai saringan kanser kolorektal dan untuk mengurangkan kejadian kes kanser kolorektal.

Kata kunci: Pengetahuan, kesedaran, saringan kanser kolorektal, kakitangan universiti

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Thank you for cooperation and kindness from all of you. I can only pray to the Almighty and may Allah give you all the best in return.

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Name: Farhani Binti Mohd Fauzi

Matric Number: 193335

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ROSNA BINTI ABDUL RAMAN

Supervisor,

Department of Nursing,

Faculty of Medicine and Health Sciences,

Universiti Putra Malaysia

Date: 31/12/2021

DR RUTHPACKIAVATHY A/P RAJA DURAI

Co-Supervisor,

Department of Nursing,

Faculty of Medicine and Health Sciences,

Universiti Putra Malaysia

Date: 31/12/2021

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LIST OF ABBREVIATIONS

BCAC	Be Cancer Alert Campaign
CRC	Colorectal Cancer
CDC	Centers for Disease Control and Prevention
EMCO	Enhanced Movement Control Order
FOBT	Fecal Blood Occult Test
iFOBT	Immunochemical Fecal Blood Occult Test
JKEUPM	Jawatankuasa Etika Untuk Penyelidikan Melibatkan Manusia Universiti Putra Malaysia
MOH	Ministry of Health
PhD	Doctor of Philosophy
STPM	Sijil Tinggi Pelajaran Malaysia
SPSS	Statistical Package for the Social Sciences

CHAPTER 1

INTRODUCTION

This chapter provides the background of the study, problem statements, and research questions. The objective of this study includes the general objective and specific objective. Besides, the null hypotheses, conceptual and operational definition were discussed in this chapter.

1.1 Background of the study

Colorectal cancer (CRC) was the third most common cause of cancer death in both men and women. As stated by Wolf et al. (2018), it was estimated that over 140,000 people in the United States were diagnosed with CRC and more than 50,000 death cases from CRC. Most cases of CRC were from people aged 50 and above but, CRC could occur in younger people who aged below 50 years old. The American Cancer Society (2020) reported that 17,930 cases of CRC were from people who aged less than 50 years old.

As CRC took over time to develop, screening for CRC was needed to detect CRC in the early stages or colorectal neoplasms in the non-malignant stages (Suh et al., 2017). Early treatment was provided for people who diagnosed with CRC so that it could reduce the complication and prevent them from developing to poor prognosis of CRC. The risk of developing CRC becomes increased due to risk factors of individuals such as age, diet, lifestyle practices and family history of CRC. Mostly, people aged 50 and above were recommended to do early screening of CRC (CDC, 2020) due to high risk to get CRC. However, younger people should do CRC screening because they tended to have poor prognosis of CRC than older people. As stated by the American Cancer Society (2020), people who consumed red refined carbohydrates, processed sugar, and red meat were at greater risk to get CRC. Also, people who lack physical

activity, smoking and drinking too much were at higher risk to have CRC. People with a first-degree relative such as parent, sibling, or child who had family history with CRC were at high risk to get CRC than people without family history of CRC.

1.2 Problem statement

Increasing colorectal cancer (CRC) cases was one of the global issues. Malaysia faced this problem despite many campaigns and programs were introduced by the government such as Be Cancer Alert Campaign (BCAC) and “Love Your Butt, Check Your Guts” Colorectal Cancer Awareness Day. If this situation continues, it would be a tough challenge for the government to overcome this crisis.

According to the American Cancer Society (2020), people aged 45 years old were recommended to do CRC screening. It was because most new cases of CRC occurred in people aged 50 and above due to lack of awareness on CRC screening (CDC, 2020). Most people in the United States did not do CRC screening as recommended that lead to delay in diagnosis and progress to poor prognosis of CRC. However, the incidence of cases in younger people increased when the incidence of cases in older people decreased. It was because in most cases, people aged below 50 years old were diagnosed with a poor prognosis of CRC (Siegel et al., 2020).

A previous study conducted by Al-Naggar and Bobryshev (2013) reported that students were lack of knowledge of CRC screening due to inadequate information and less promotion from the public media campaigns. Another study showed that less than 20% of the people went for follow-up appointments and from these, only 50% of the people who did colonoscopy for CRC screening (Chong et al., 2020). The participants thought that colonoscopy procedure was not necessary because they were feeling healthy (Chong et al., 2020), did not have or denial of family history with CRC (Martin et al., 2013), being busy, especially for workers, and put their existing health problems as a priority to be treated first before attending for CRC screening

(Surendra et al., 2017). Other than that, most barriers that related to CRC screening were afraid of finding cancer, expensive costs of tests and lack of health insurance coverage (Zainuddin & Shamri, 2018). Meanwhile, in the health system, poor knowledge of screening guidelines, high cost, and inadequate coverage, poor recommendation in primary healthcare, and inadequate healthcare providers in performing screening were the most barriers regarding CRC screening (Althobaiti & Jradi, 2019). These could lead to delay for seeking treatment on CRC.

Lifestyle practices could contribute to the risk factors to develop CRC among the population. Al-Naggar, Bobyshev and Osman (2013) mentioned that in Western countries, about 30% causes of cancer could be prevented only through managing diet and reducing tobacco intake. As suggested by Durko and Malecka-Panas (2014), people who were taking a lot of fruits and vegetables in their diet could reduce more than 20% of the incidence cases for CRC. Increasing intake of refined carbohydrates, processed sugar, and red meat could lead to higher risk to have inflammation and to develop CRC (American Cancer Society, 2020). Consuming protein sources such as poultry, fish or legumes would give advantages to reduce the risk of CRC than red meat (Durko & Malecka-Panas, 2014). More than 20% of the people who were physically active had low risk to develop both proximal and distal colon tumors than the least active people. Current smokers or former smokers had higher risk to get CRC than those who never smoke. For people who drink alcohol more than 3 drinks in a day, they had 25% higher risk to develop CRC than light to moderate alcohol consumption (up to two drinks per day) and no consumption or occasional consumption of the alcohol (American Cancer Society, 2020). It was because the population who practiced good and healthy lifestyles could reduce the risk to develop CRC.

1.3 Significance of the study

Many studies have been conducted globally and locally that focused on colorectal cancer (CRC) screening among public people (Al-Naggar & Osman, 2013; Pan et al., 2017; Saeed et al., 2018; Sindhu et al., 2019; Tfaily et al., 2019). However, most of the studies focused on the population with a medical background (Althobaiti & Jradi, 2019; Pietrzyk, et al., 2017; Surendra et al., 2016). It was because the population with a medical background had better awareness of CRC screening due to their pre-requisite knowledge from their formal curriculum education and clinical practice experience. Therefore, this study was conducted among university staff without focusing on their background and assessing their knowledge and awareness towards CRC screening.

There were a lot of studies or research that had been done overseas regarding CRC screening (Al Eid et al., 2017; Barasheed et al., 2020; Rababah, Alhassan & Al-Motlaq, 2018). Still, there were a limited number of studies had been done specifically to assess knowledge and awareness towards CRC screening among university staff. Since there were limited studies done to assess the knowledge and awareness among university staff, this study was worth to be conducted in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia to fulfill the research gaps and to provide an overall view on the knowledge and awareness on CRC screening among staffs. The finding from this study was useful to provide information and to develop a strategy that could be approached to overcome this issue. This was because university staffs were more exposed to CRC screening programs than the communities who lacked exposure. As a result, it could increase the knowledge and awareness of university staff towards CRC screening. They would be influencers who approached the community to participate on CRC screening. Also, they could be educators to promote and to educate the community about CRC screening, at least among family members and friends. It would also encourage other researchers in Malaysia to do other research that focused on CRC screening among university staff.

1.4 Research Questions:

- i. What is the association between socio-demographic data and knowledge of colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia?
- ii. What is the association between socio-demographic data and awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia?
- iii. What is the association between knowledge and awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia?

1.5 Research Objectives

1.5.1 General Objectives

The general objectives is aimed to determine the level of knowledge and awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

1.5.2 Specific Objectives

- i. To identify the socio-demographic data of the staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
- ii. To determine the knowledge of colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

- iii. To determine awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
- iv. To determine the association between socio-demographic data and knowledge of colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
- v. To determine the association between socio-demographic data and awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
- vi. To determine the association between knowledge and awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

1.6 Hypothesis

1.6.1 Null Hypothesis

- Ho1: There is no significant association between socio-demographic data and knowledge of colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
- Ho2: There is no significant association between socio-demographic data and awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
- Ho3: There is no significant association between knowledge and awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

1.6.2 Alternative Hypothesis

- Ho1: There is a significant association between socio-demographic and knowledge of colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
- Ho2: There is a significant association between socio-demographic and awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
- Ho3: There is a significant association between knowledge and awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

1.7 Conceptual and Operational Definition

Terms	Conceptual Definition	Operational Definition
Knowledge	Knowledge was a collection of experience, appropriate information, and skilled insight, which offers a structure for estimating and integrating new experience and information (Mohajan, 2016).	Knowledge is defined as the information and experience of staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia regarding to colorectal cancer screening. The online questionnaire, which was Knowledge of colorectal cancer screening among sub-urban community in Sepang, Selangor by Amir Firdaus Rosli et al. (2017) was used to measure the level of knowledge of colorectal cancer among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

Awareness	Awareness was realization, perception, and cognitive reaction to a condition or event (Gafoor, 2012).	Awareness is referred to the realization and perception towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. The online questionnaire, which was Public awareness of colorectal cancer and preference screening tool in Malaysia by Suan, Mohammed and Hassan (2016) was used to determine the awareness towards colorectal cancer among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.
Colorectal Cancer Screening	Screening was the application of tests or procedures for the early detection of disease in asymptomatic people (Chan et al., 2017). Screening is a useful test to detect colorectal cancer.	Colorectal cancer screening was a program used for the early detection of colorectal cancer among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.
Staff	Staff was the group of people who work for an organization (Cambridge Dictionary, 2020).	It refers to staff who working in the public higher education institution, which was the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

CHAPTER 2

LITERATURE REVIEW

This chapter provided an overview of previous studies on colorectal cancer screening. It introduced the framework of this study that comprises the main focus of the research described in this thesis.

2.1 The Overview of Colorectal Cancer Screening

Colorectal cancer (CRC) was the most common type of cancer worldwide. CRC is defined as cancer that happened in the colon or rectum. The American Cancer Society (2020) stated that cancer was developed from abnormal growths on the inner lining of the colon or rectum called polyps but only several types of polyps might turn into cancer over time. Because of that, early screening was necessary for adults who were at greater risk to get CRC as it could detect CRC even in asymptomatic people.

Next, CRC screening was available and had benefits to people as it could find out the causes of CRC. CRC screening was very vital to reduce the burden of morbidity and mortality due to cancer. It was because screening tests could detect pre-cancerous lesions in the early stage so that treatment would be provided to the people who had diagnosed with CRC. Through screening tests, it could prevent the disease from progressive to poor prognosis and reduce the incidence of cancer death. Early screening of CRC could increase the survival rate of people who were diagnosed with CRC. The American Cancer Society (2020) mentioned that more than 50% of the people had a 5-year relative survival rate when detecting CRC at the early stage. Thus, increasing participation rates in screening tests were needed to measure successful programs to reduce CRC cases and mortality.

CRC screening was recommended for people who aged 45 years old (American Cancer Society, 2020). As reported by the CDC (2020), CRC screening was necessary for people aged 50 to 75 years old. It was because 90% of the incidence cases of CRC happened in individuals aged 50 and above. People who were at a high risk of CRC should do screening before age 50 because they were at a high chance to develop CRC. Ghazali et al. (2019) stated that younger people who were less than 35 or 35 years old with CRC had poorer overall survival rate due to the higher proportion of these people to have advanced stage of CRC. It was because younger people had lack of CRC screening and were not available to access their healthcare due to being busy in the workplace. They did not suspect about malignancy and risk of misidentify CRC as haemorrhoids or fissures that lead to delay in diagnosis (Patil et al., 2017).

On the other hand, the gold standard technique for CRC screening was colonoscopy because it could look out the entire bowel and also used to remove any visualized pre-cancerous lesion (Suan, Mohammed & Hassan, 2016) but it needs trained skills, limited availability, and more cost to do colonoscopy. In an addition, fecal occult blood test and sigmoidoscopy were used as preferred tools for CRC screening. According to Chandran et al. (2020), The Cancer Unit, Disease Control Division, and Ministry of Health (MOH) coordinated the CRC screening program nationwide in 2014. Immunochemical fecal occult blood test (iFOBT) kits was annually distributed to all participating in MOH Health clinics. The individuals who fulfilled the criteria were selected to participate in the screening test for CRC. Then, the participants of CRC screening must give their consent to participate in the program. They should provide their demographic information and it would be documented manually in a screening registration book at a respective facilities. They would be informed about the benefit of screening for CRC. It is to ensure that the participants had a better understanding of CRC screening. Furthermore, colonoscopy was needed for the participants who had positive result in iFOBT kits as it was not a confirmatory test for CRC. They should do follow up and visit the nearest hospital for further

management. In addition, they must send the stool sample to the health clinics to prevent false results due to incorrect handling of iFOBT kits. For the participants with a negative result of iFOBT, they should take an appointment in 2 years for a repeat screening. Education should be given for them to practice a healthy lifestyle (Chandran et al., 2020).

2.2 Knowledge of Colorectal Cancer Screening

It was important to authorize the general population about correct knowledge of cancer prevention and related to lifestyle (Al-Naggar & Osman, 2013). Through health education and programs on colorectal cancer (CRC) screening, it could increase their knowledge on CRC as well as encourage them to do CRC screening and maintain healthy lifestyle so that it could reduce the incidence of morbidity and mortality due to CRC.

A previous study stated that the population from developed country such as Australia, Singapore and Hong Kong had greater knowledge on CRC than population from developing country (Su et al., 2013). First and second relatives with family history of CRC had higher levels of knowledge on CRC than people without family history of CRC (Martin et al., 2013). Even most survivors had higher knowledge on symptoms, screening tests and risk factors for CRC (Huang et al., 2019) but they had less health motivation and ignorance to do CRC screening (Azeem et al., 2016) that leading to delay diagnosis for CRC.

Besides, employees who were working full-time had inadequate knowledge on CRC risk factors because they were busy doing their own job and did not aware about educational initiatives for CRC (Martin et al., 2013). Furthermore, the community could get a source of information about CRC screening from school and college education, the internet, journals and newspaper, and other resources such as television, family members and friends (Barasheed et al., 2020).

According to Azeem et al. (2016), not all people could access their knowledge through media, schools and public campaigns. Also, insufficient health education and lack of efficient screening programs for CRC could lead to inadequate knowledge and awareness to do CRC screening among the population (Al-Naggar & Bobryshev, 2013). Health care professionals had insufficient knowledge due to lack of training and inadequate regular clinical experiences with CRC (Muliira et al., 2016). Because of that, health care professionals should join the educational programs and involve in training about CRC so that they would be more informative and had effective skills on the guidelines of CRC screening. On the other hand, the family physician should recommend CRC screening for the patients and involve the family members during counselling session so that family members could understand about CRC and provide the assistance for the patients. Last but not least, providing educational aids such as pamphlet and short video was helpful for the patients to have better understanding about CRC and colonoscopy procedure (Suan et al., 2020).

2.3 Awareness towards Colorectal Cancer Screening

Awareness was one crucial thing that drives a person to take action to participate in colorectal cancer (CRC) screening. Public campaigns on CRC screening were needed to increase the awareness among the general population on CRC screening.

The previous studies by Suan, Mohammed and Hassan (2016) showed that most respondents were aware that CRC is the third most common type of cancer in Malaysia. They recognized the symptoms of CRC, which were changing in bowel habit, bloody stool, weight loss, and abdominal pain. However, some respondents were unaware of the risk factors of CRC such as positive family history, obesity, and old age. According to Imran et al. (2016), the medical students and females had sufficient knowledge and awareness for CRC than non-medical students and males. Furthermore, most university students still did not have adequate knowledge

and lack awareness of CRC. The study in Brunei stated that most developing countries had minimal awareness on CRC due to lack of financial support among the population. The involvement or level of awareness on the health among the population would be increase if the healthcare system was provided the medical coverage for free as they needed to pay for treatment. For example, healthcare system in Brunei Darussalam was provided free medical coverage to all citizens and permanent residents. It could help to reduce financial burden, especially for the people who needed financial support for the treatment (Chong et al., 2015).

Pietrzyk et al. (2017) reported that the participants had poor awareness on smoking cessation and control of alcohol consumption due to insufficient, disintegrated and poor management on cancer education at medical universities. Su et al. (2013) mentioned that in Malaysia, the people in rural area had poor awareness related to unhealthy lifestyle behaviour as risk factors for CRC such as low fruit and vegetables intake, low fibre, high intake of red meat and processed meat, being overweight and low physical activity. As stated by Al-Dahshan et al. (2020), lifestyle modification could be a comprehensive approach to reduce the incidence of CRC. Increasing fibre intake and reducing the intake of red or processed meat could reduce more than 27% of cases of CRC. Meanwhile, effective management of obesity could reduce the incidence of CRC. Because of that, health care providers played an important role to educate about lifestyle modification to prevent developing of cancer among the rural population at the health care facilities and through mass media like television as an education tool for CRC (Pietrzyk et al., 2017).

2.4 Factors associated with Colorectal Cancer Screening

There were several factors from socio-demographic data that contributed to a person's eligibility to do colorectal cancer (CRC) screening. CDC (2020) reported that recommended age for CRC screening was from 50 to 75 years old. Because of that, people aged up to 50 years old and were

at high risk to get CRC should be aware and participate in CRC screening. As the result, early detection and treatment would be provided among the population to decrease the rates of morbidity and mortality worldwide. Pan et al. (2017) mentioned that 60.5% of the respondents who aged 30- 39 years had better information about the warning signs of CRC. Meanwhile, only 34.8% of people who aged 60 and above had adequate knowledge on CRC. As stated by Alshammari, Alenazi, and Alshammari (2020), people aged 50 and above, and had positive family history for cancer were more knowledgeable than others. The previous studies by Veettil et al. (2017) showed that less than 2% of new cases of CRC in younger adults with poor prognosis of CRC were due to inadequate knowledge on CRC. These incidents occurred because of the changes in lifestyle among the young generation that leads to a poor prognosis of CRC. Due to these problems, modification of lifestyles were needed for young adults who were at a high chance to get CRC.

Besides, gender was one of the important conditions that determine a person's eligibility and comes forward to participate in CRC screening. CRC was the most prevalent case in men and the second most prevalent cases in women. Among individuals who aged 50 and older, women were more likely to develop adenomas in the proximal colon, which were less efficiently detected through screening (American Cancer Society, 2020). Schliemann et al. (2020) mentioned that most cases of CRC among men and women were detected at a late stage, which was stage 3 and 4 that leads to a greater chance of death due to cancer. It is because of delayed diagnosis and unawareness about the risk factors of CRC (Suan, Mohammed & Hassan, 2016). Ghahramani, Jahani and Abdollahifard (2015) stated that female lecturers had greater knowledge about colon cancer and screening program compared to female faculty members because they spared their time to find information through electronic media.

On the other hand, race could influence the person's eligibility to involve in CRC screening. According to the American Cancer Society (2020), during 2012-2016, the rates of incidence for CRC in black were 20% more than people in non-Hispanic whites (NHWs) and more than half in Asians/ Pacific Islanders (APIs). However, the black population was less to develop adenomas or CRC compared to the white population. Some research showed the Chinese population had greater CRC cases than Indian and Malay. The risk of developing CRC among the Chinese population in Malaysia for the female was higher than male (Veettil et al., 2017). However, major ethnic group that had CRC were from Malay people, then by Indian, Chinese and other ethnicity. The respondents from Indian and Chinese had poor knowledge of CRC than Malay ethnicity (Su et al., 2013).

Last but not least, the level of education could influence the perception and awareness of individuals to participate in CRC screening. Those with poor educational backgrounds were more likely to have language and communication barriers, and had a harder time understanding materials or recommendations. According to Mhaidat et al. (2018), students with a medical background were more aware of CRC symptoms and risk factors compared to non-medical students. Al-Thafar et al. (2017) reported that most participants with master's degrees or Ph.D. had a lot of knowledge and a good attitude for screening compared to Bachelor and Diploma participants. Previous study showed that people with post-secondary education had good knowledge on warning signs of CRC than primary school level of education (Pan et al., 2017). Besides, the teachers with medical background played the important roles to indicate the benefit of cancer prevention in the medical school curriculum so that it could enhance the medical students' knowledge about screening practices and guidelines for CRC (Althobaiti & Jradi, 2019). They could be a future generation that educated the community to participate in CRC screening and to practice good lifestyles so that early detection and prevention would be provided to people who were diagnosed with CRC. However, Souza et al. (2012) stated that doctors graduated for more than 15 years did not know about CRC screening because the

guidelines and screening methods for CRC were being improved in the past decade, when these doctors had already finished their basic. They should follow the changes of advanced technology and improve the management in the healthcare system through training and joining the programs of CRC screening. As a result, they would be more up to date on the guidelines and screening methods of CRC as well as had a good skills in performing methods of CRC screening.

2.5 Conceptual Framework

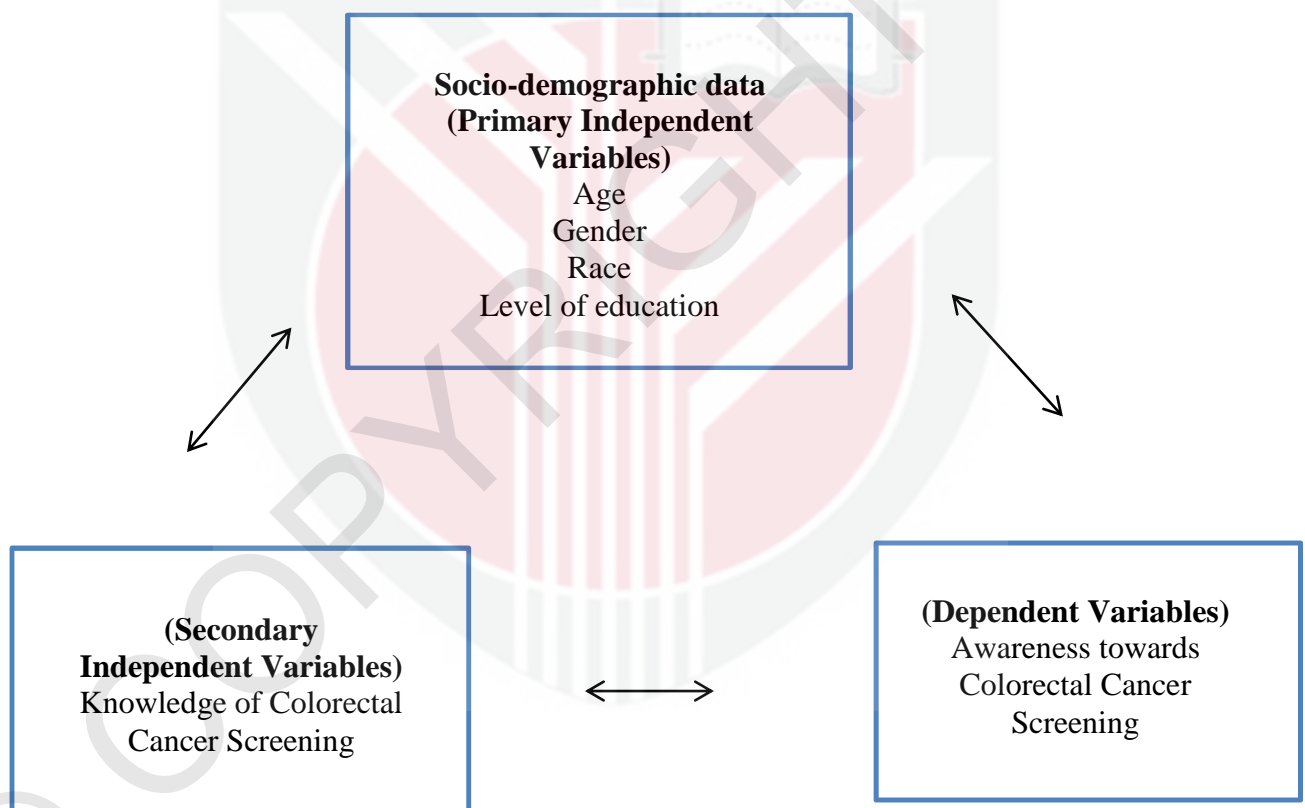


Figure 2.5.1 The Conceptual Framework of this Study

The independent variables in this study were divided into two main, which were the primary and secondary independent variables. The primary independent variable was focused on socio-

demographics of staff that consisted of age, gender, race and level of education. The secondary independent variable in this study was knowledge of colorectal cancer screening. Meanwhile, the dependent variable for this study was awareness towards colorectal cancer screening. Figure 2.5.1 showed the conceptual framework for this study. Based on the conceptual framework, this study was used to identify the association between independent variables (socio-demographic data and knowledge of colorectal cancer screening) and the dependent variable (awareness towards colorectal cancer screening) among university staff.



CHAPTER 3

RESEARCH METHOD

This chapter discusses in detail the research method that has been used in this study to determine the association between socio-demographic data and knowledge with awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

3.1 Research Design

The research design for this study was quantitative research. The study design that had been chosen for this study was a cross-sectional study. A self-administered online questionnaire was used to determine the association between knowledge and awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

3.2 Study Location

This study was conducted at one of the public higher education institutions that located in Serdang, Selangor known as Universiti Putra Malaysia. It was involved the staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia via the online platform. The data was collected within three months (May, June and July 2021) and the whole process of this study took approximately seven months to complete.

3.3 Study Population

This study was involved university staff from the Faculty of Medicine and Health Sciences in Universiti Putra Malaysia were chosen using simple random sampling.

3.4 Subject Criteria

There were several inclusion and exclusion criteria in this study which are:

Inclusion Criteria:

- Non-academic staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia

Exclusion Criteria:

- Staff that had history of colorectal cancer
- Staff had family history of colorectal cancer
- Staff was on sick leave

3.5 Sample size estimation

For the sample size estimation, this study used comparing two proportion sample size estimation (Comparing Two Proportions – Sample Size – Select Statistical Consultants, n.d.). The sample size was calculated by using online two proportion calculator derived from <https://select-statistics.co.uk/calculators/sample-size-calculator-two-proportions/> as shown below:

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

Where:

n = Sample size

$Z_{\alpha/2}$ = critical value of the Normal distribution at $\alpha/2$ (e.g. for a confidence level of 95%, α is 0.05 and the critical value is 1.96)

Z_{β} = critical value of the Normal distribution at β (e.g. for a power of 80%, β is 0.2 and the critical value is 0.84)

p_1 and p_2 are the expected sample proportions of the two groups.

Firstly, the sample size for testing two population proportions, which $p_1 = 28.8\%$ (0.288) showed a good score in knowledge from the study of Public Awareness of Colorectal Cancer Screening in Makkah, Saudi Arabia by Barasheed et al. (2020) while $p_2 = 44\%$ (0.44) showed a good score in knowledge from the study of Knowledge, Attitudes and Awareness about Colorectal Cancer in the Kingdom of Saudi Arabia: A Cross Sectional Study by Alotaibi, Mujtaba and Alshammari (2020). The sample size was calculated as shown below:

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

$$n = (1.96 + 0.84)^2 * (0.288(1-0.288) + 0.44(1-0.44)) / (0.288 - 0.44)^2$$

$$n = 154$$

Adjusted with 10% non-response rate = 10% of 154 = 15.4. Hence, total sample size was 169.4 which round off as 170.

Secondly, the sample size for testing two proportions, which $p_1 = 16.3\%$ (0.163) that showed a good score of awareness from the title of study was Public Awareness of Colorectal Cancer Screening in Makkah, Saudi Arabia by Barasheed et al. (2020) while $p_2 = 50\%$ (0.50) showed a good score of awareness from study of Knowledge, Attitudes and Awareness about Colorectal Cancer in the Kingdom of Saudi Arabia: A Cross Sectional Study by Alotaibi, Mujtaba and Alshammari (2020). The sample size was calculated as shown below:

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

$$n = (1.96 + 0.84)^2 * (0.163(1-0.163) + 0.50(1-0.50)) / (0.163 - 0.50)^2$$

$$n = 27$$

Adjusted with 10% non-response rate = 10% of 27 = 2.7. Hence, total sample size was 29.7 which rounded off as 30.

Highest calculation took to cover the population among non-academic staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. Therefore, the sample size for this study was 170 respondents.

3.6 Sampling method and subject recruitment

The participants for this study was involved the staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. The researcher used the probability simple random sampling method in this study and the participants were selected through Randomizer. The questionnaires were distributed via the Google Form among the participants until the sample size was reached. The inclusion criteria was listed in the Google Form and the participants should tick it before answering the questionnaire. Then, the participants who were volunteered to participate and fulfilled the inclusion criteria were recruited in this study.

3.7 Research tools or instruments

The self-administered and adapted questionnaire was used to collect the data of this study. The questionnaire was checked by the supervisor and co-supervisor to determine its validity. Then, a pilot study was conducted among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia before proceeding with a proper study to evaluate whether the questions were clear and easy to understand. The content validity was conducted to ensure the matching between the test questions with the items in the questionnaire, which was supposed to be measured. Cronbach's alpha was done involving 10% of the sample size to validate the questionnaire for this study. The reliability was tested with the Cronbach's alpha 0.819 and 0.751 through the online questionnaire, which were 'Knowledge of colorectal cancer screening

among sub-urban community in Sepang, Selangor' by Amir Firdaus Rosli et al. (2017) and 'Public awareness of colorectal cancer and preference screening tool in Malaysia' by Suan, Mohammed and Hassan (2016). These questionnaires were used to determine the knowledge and awareness towards CRC screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

There were two sections of the questionnaire as followed:

Section A: Socio-demographic Data

This section consisted of 4 items that might include the ID/Code where it had been filled by the researcher itself and each participant having their ID to distinguish each participant of this study. Then, it was followed by age, gender, race, and level of education. This section was adapted from the study conducted by Suan, Mohammed and Hassan (2016) with the title of the study was 'Colorectal Cancer Awareness and Screening Preference: A Survey during the Malaysian World Digestive Day Campaign'

Section B: Knowledge of Colorectal Cancer Screening

In this section, the questionnaire was focused on the knowledge of CRC screening. The pre-test was carried out among 10% of the sample size, which was 15 staffs and the reliability Cronbach's alpha for this questionnaire was 0.819. The questionnaire consisted of 7 questions, which was 5 questions about the warning signs and the risk factors of CRC. Meanwhile, 2 questions asked about the screening method for CRC, which was Faecal Ocult Blood Test (FOBT), Sigmoidscopy and Colonoscopy. The total score for this questionnaire was 33 scores. The scores were classified into 3 groups (poor, moderate and good knowledge). The range mark of 0 to 10 was classified as poor knowledge. Then, medium knowledge was reflected by mark range of 11 to 22. The range mark for poor knowledge was from 23 to 33. This section was

adapted from the study conducted by Amir Firdaus Rosli et al. (2017) with the title of the study was 'Knowledge and attitude on colorectal cancer screening among sub-urban community in Sepang, Selangor'.

Section C: Awareness towards Colorectal Cancer Screening

In this section, the questionnaire was focused on the awareness towards CRC. The pre-test was conducted among 10% of the sample size and the reliability Cronbach's alpha for this questionnaire was 0.751. A total question for this section were 10 questions. The respondents should choose suitable answer for each question. If the respondents were answered the questions correctly had given the score 1, and then 0 for an incorrect or wrong answer. This questionnaire was interpreted by higher the total score, higher the awareness towards CRC screening. This section was adapted from the study conducted by Suan, Mohammed and Hassan (2016) with title of study was 'Colorectal Cancer Awareness and Screening Preference: A Survey during the Malaysian World Digestive Day Campaign'.

3.8 Data collection

The data collection for this study was conducted within three months through the online platform and social media to easily reach out the university staff. The questionnaire was made into an online format using Google form. Then, the researcher explained the purpose of the study to the participants. The Participant Information Sheet was added on the first page of the questionnaire to make sure that the participants understood all the terms allocated. Participation was voluntary. Consent was automatically obtained once the participants ticked the button and submitted the questionnaire. All data was kept in Google Account to ensure privacy and confidentiality.

3.9 Study Flowchart

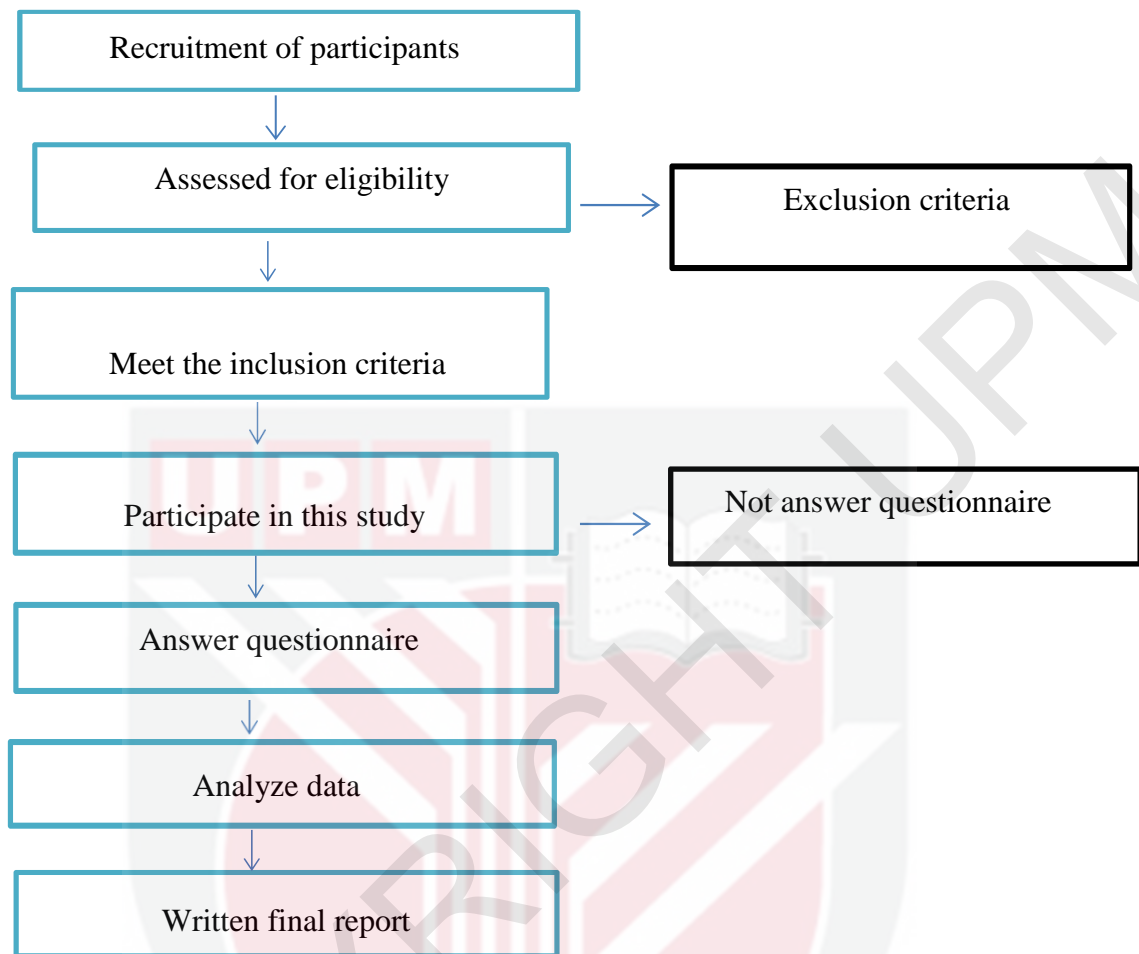


Figure 3.9.1 Study Flowchart for this study

The data collection was conducted as soon as possible after obtaining ethical approval from the Ethics Committee for Research Involving Human Subjects (JKEUPM). Figure 3.9.1 showed the study flowchart for this study. Based on Figure 3.9.1., the participants who fulfilled the inclusion criteria of this study were approached to participate as participants in the study. Then, the participants who were volunteered to participate in this study were recruited as the participants of this study. Next, the researcher explained the objective of this study to the participant individually. The consent was obtained from the participants before answering the questionnaire. The participants were allowed to withdraw from this study at any time and all the

data collected for this study was kept confidential and secured in Goggle Account where only the researcher could access the data. Any withdrawal participants or incomplete questionnaire was not included in the data collection. The questionnaire was distributed to the participants in Google Form. The time allocated for the participants to answer the questionnaire was about 15 to 30 minutes. After the participants submitted the completed questionnaire, the data was collected for further analysis. The researcher analyzed the data using the Statistical Package for the Social Sciences (SPSS) Version 22.0 for Windows and wrote the final report for this study.

3.10 Data analysis

3.10.1 Normality Test

A normality test was carried out to see the normal distribution of the data, in which skewness and kurtosis were -2 to 2.

3.10.2 Descriptive Statistic

Table 3.10.2.1 Descriptive analysis for this study

Objectives	Variables	Type of variables	Descriptive analysis
i. To determine the socio-demographic data among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia	Age	Continuous	Mean (Standard Deviation)
	Gender	Categorical	Frequency and percentage
	Race	Categorical	Frequency and percentage

	Level of education	Categorical	Frequency and percentage
ii. To determine the knowledge of colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia	Knowledge of colorectal cancer screening	Categorical	Frequency and percentage
iii. To determine the awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia	Awareness towards colorectal cancer screening	Continuous	Mean (Standard Deviation)

3.10.3 Inferential Statistic

Table 3.10.3.1 Inferential analysis for this study

Objectives	Dependent variables	Independent variables	Analysis (parametric)
i. To determine the association between socio-demographic and knowledge of colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia	Knowledge of colorectal cancer screening (categorical)	Age (continuous)	Point-Biserial Correlation
		Gender (categorical)	Pearson chi-square
		Race (categorical)	Pearson chi-square

		Level of education (categorical)	Pearson chi-square
ii. To determine the association between socio-demographic and awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia	Awareness towards colorectal cancer screening (continuous)	Age (continuous)	Pearson Correlation or Regression
		Gender (categorical)	Independent t-test
		Race (categorical)	One Way Independent ANOVA
		Level of education (categorical)	One Way Independent ANOVA
iii. To determine the association between knowledge and awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia	Awareness towards colorectal cancer screening (continuous)	Knowledge of colorectal cancer screening (categorical)	One Way Independent ANOVA

3.11 Ethical Consideration

Written approval and permission was obtained from the Ethics Committee for Research Involving Human Subject (JKEUPM). All participants was provided with a participant information sheet for their willingness to participate in this study. After the informed consent was obtained, they would

directly go to the next page that contains the questionnaire for this study. The participants could ask any questions or clarification about the study through the contact information of researchers were provided in the survey. If the participants were not interested in the study, they were allowed to withdraw themselves and any incomplete questionnaire would not included in data collection. Inform consent was necessary to be taken from the participants to ensure that the participants understood about the study clearly before giving their consent to participate in the study. Participant confidential information was kept and could not be traceable by other individuals since it was secured in a Google account that only could be accessed by the researchers. The download data was kept in a password protected computer, thumb-drive, and cloud account for 5 years and would be permanently destroyed.

CHAPTER 4

RESULT

This chapter presents the results of this study that aimed to determine the association between socio-demographic data and knowledge with awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. All data was analyzed by using the Statistical Package for the Social Science (SPSS) 22.0. Kolmogorov- Smirnov test was used in this study to test for normality and the data was normally distributed with Skewness and Kurtosis value of 0.241 and 0.478 respectively. Hence, parametric test was used to determine the association between socio-demographic data and knowledge with awareness towards colorectal cancer screening among the participants.

4.1 Respond rate

A total of 170 respondents from the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia were the targeted sample size for this study. Only 100 respondents were involved in this study due to many limitations such as Enhanced Movement Control Order (EMCO) and online questionnaire, which made the response rate was 58.82%. Most of the respondents were working at a home and the researcher could not approach this group in a proper manner.

4.2 Socio-demographic data of the respondents

Table 4.2.1 showed the socio-demographic data of the respondents based on their age, gender, race and level of education. Overall, the mean age of the respondents was 39.340 ± 6.328 . Out of 100 respondents, 30 (30%) of them were male and 70 (70%) of them were female. The majority of the respondents were Malay 81 (81%), followed by Chinese 7 (7%), Indian 9 (9%) and other ethnicity 3 (3%). Most of the respondents' highest educational level were Diploma 43 (43%). Meanwhile, the lowest educational status of the respondents in this study were

secondary school 10 (10%) and certification such as Sijil Tinggi Pelajaran Malaysia (STPM), Matriculation, Foundation or other certification 10 (10%).

Table 4.2.1 Socio-demographic data of the respondents (n=100)

Socio-demographic data	Frequency (n)	Percentage (%)	Mean	±SD
Age			39.340	±6.328
Gender				
Male	30	30.0		
Female	70	70.0		
Race				
Malay	81	81.0		
Chinese	7	7.0		
Indian	9	9.0		
Others	3	3.0		
Level of education				
No formal education	0	0.0		
Primary school	0	0.0		
Secondary school	10	10.0		
Certification (STPM/ Matriculation/ Foundation/ Others)	10	10.0		
Diploma	43	43.0		
Bachelor	37	37.0		

Master	0	0.0
PhD	0	0.0

4.3 Knowledge of Colorectal Cancer Screening

Based on Table 4.3.1, most of the respondents had good knowledge on a warning sign for colorectal cancer (CRC). Out of 100 respondents, 96 (96%) knew that changing in bowel habits as the warning signs for CRC, followed by feeling that the bowel does not completely empty 95 (95%), tiredness or anemia 88 (88%), bleeding from the back passage 86 (86%), blood in the stools 86 (86%) and persistent pain in the abdomen 75 (75%). Some of the respondents did not know that continuously pain in the back passage 57 (57%), lump in the abdominal 31 (31%) and sudden loss weight 37 (37%) were the warning signs for CRC. Majority of the respondents had knowledge about the risk factors for CRC were family history of CRC 91 (91%), eating less than 5 portions of fruits and vegetables 76 (76%), eating a red or processed meat once a day or more 84 (84%), having a diet low in fibre 93 (93%), smoking and alcohol consumption 72 (72%) ,and having bowel disease 86 (86%). More than 30% of the respondents had low knowledge that age factor (above 50 years old), lack of physical activity, having diabetes, having cervical cancer, breast or ovary, and being overweight as the risk factors for CRC.

Besides, there were 97 (97%), 66 (66%) and 44 (44%) had heard about Fecal Occult Blood Test (FOBT), sigmoidoscopy and colonoscopy as the screening procedure for CRC. Only 17 (17%) of the respondents answered that age above 50 years as the starting age to involve in CRC screening procedure. For the appropriate time interval to undergo the CRC screening procedure, 78 (78%) respondents answered 1 year interval for FOBT, followed by 54 (54%) of the respondents answered 5 year interval for sigmoidoscopy and 35 (35%) of the respondents answered 10 year interval for colonoscopy. Only 74 (74%) of the respondents knew that the stool samples for FOBT should be taken for 1 to 3 times, while 26 (26%) of the respondents did

not sure about the stool samples that were needed for FOBT. More than 90 (90%) of the respondents answered that taking laxative medicine according to the doctor's instructions and full fasting from midnight should be done the day before performing a colonoscopy, but the other answered that drinking only water 65 (65%), eating only fiber and protein sources 40 (40%), and avoid eating a lot of starch 49 (49%) need to be done the day before having the colonoscopy.

Table 4.3.1 Knowledge of colorectal cancer screening among the respondents

(n=100)

Questions	Frequency (N)	Percentage (%)
What is warning signs for colorectal cancer?		
Bleeding from the back passage		
False	14	14.0
True	86	86.0
Change in bowel habits		
False	4	4.0
True	96	96.0
Persistent pain in the abdomen		
False	25	25.0
True	75	75.0
Feeling that the bowel does not completely empty		
False	5	5.0
True	95	95.0
Blood in the stools		
False	14	14.0

True	86	86.0
Continuously pain in the back passage		
False	57	57.0
True	43	43.0
Lump in the abdominal		
False	31	31.0
True	69	69.0
Tiredness/ anaemia		
False	12	12.0
True	88	88.0
Sudden weight loss		
False	37	37.0
True	63	63.0
What is the risk factors for colorectal cancer?		
Age factor (above 50 years old)		
False	39	39.0
True	61	61.0
Family history of colorectal cancer		
False	9	9.0
True	91	91.0
Eating less than 5 portions of fruit and vegetables		
False	24	24.0
True	76	76.0
Eating red or processed meat once a day or more		
False	16	16.0
True	84	84.0
Having a diet low in fibre		
False	7	7.0

True	93	93.0
------	----	------

Smoking and alcohol consumption

False	28	28.0
-------	----	------

True	72	72.0
------	----	------

Lack of physical activity

False	44	44.0
-------	----	------

True	56	56.0
------	----	------

Having bowel disease

False	14	14.0
-------	----	------

True	86	86.0
------	----	------

Having diabetes

False	57	57.0
-------	----	------

True	43	43.0
------	----	------

Having cervical cancer, breast or ovary

False	63	63.0
-------	----	------

True	37	37.0
------	----	------

Being overweight

False	52	52.0
-------	----	------

True	48	48.0
------	----	------

What is the screening procedure for colorectal cancer that you know?**Fecal Occult Blood Test**

False	3	3.0
-------	---	-----

True	97	97.0
------	----	------

Sigmoidoscopy

False	34	34.0
-------	----	------

True	66	66.0
------	----	------

Colonoscopy

False	58	58.0
True	42	42.0

What is the starting age to participate in the colorectal cancer screening procedure?

Below 50 years old	83	83.0
Above 50 years old	17	17.0

What is the appropriate time interval to undergo a colorectal cancer screening procedure?

Fecal Occult Blood Test- 1 year interval

False	22	22.0
True	78	78.0

Sigmoidoscopy- 5 year interval

False	46	46.0
True	54	54.0

Colonoscopy- 10 year interval

False	65	65.0
True	35	35.0

How many stool samples are needed for the Fecal Occult Blood Test?

Not sure	26	26.0
1-3 times	74	74.0

What should be done the day before having a colonoscopy?

Drink only water

False	35	35.0
True	65	65.0

Eat only fiber and protein sources

False	60	60.0
-------	----	------

True	40	40.0
Avoid eating a lot of starch		
False	51	51.0
True	49	49.0
Take laxative medicine according to your doctor's instructions		
False	4	4.0
True	96	96.0
Full fast from midnight		
False	9	9
True	91	91.0

According to Table 4.3.2, there were three categories of knowledge of CRC screening which had poor, moderate and good knowledge. More than half of respondents had good knowledge 55 (55%) about the warning signs, the risk factors and screening procedure for CRC.

Table 4.3.2 Category of knowledge of colorectal cancer screening among the respondents (n=100)

Variable	Category, N (%)		
	Poor	Moderate	Good
Knowledge of colorectal cancer screening	0 (0.0)	45 (45.0)	55 (55.0)

4.4 Awareness towards Colorectal Cancer Screening

Regarding to Table 4.4.1, the mean and standard deviation for awareness towards colorectal cancer (CRC) screening among the respondents was 7.750 ± 1.914 . More than 60.0% of the respondents were aware that CRC is among the top 3 cancers in Malaysia. Most of the respondents 93 (93%) knew the origin of the CRC frequently started from polyps in the colon or rectum and only 7% of them did not know the origin of the CRC. More than half of the respondents denied that CRC often started without showing any symptoms. Besides, over 80% of the respondents were aware that early detection of CRC and an effective treatment could prevent CRC. Majority of the respondents 87 (87%) were preferred to do screening test for CRC even though they did not have any symptoms of CRC. About 49%, 21% and 17% of the respondents were volunteered to do Fecal Occult Blood Test (FOBT), Sigmoidoscopy and Colonoscopy as the screening test for CRC. However, there were 13% of the respondents did not willing to undergo any CRC screening test. Then, 67 out of 100 respondents were aware that earlier detection of early stage of CRC could potentially leads to a complete cure of the disease. A total of 90.0% of the respondents realized that late detection of late stage of CRC carries poorest survival rate. Most of the respondents were asked about their preferred if the doctor advised them to do colonoscopy. Most of the respondents 57 (57%) were willing to wait for 6 – 8 months to get free test, followed with not preferring to have any screening test 22 (22%), and willing to pay RM800 by using their own money and have the colonoscopy test within a week 21 (21%).

Table 4.4.1 Awareness towards colorectal cancer screening among the respondents (n=100)

Characteristics	Mean	±SD	Frequency (N)	Percentage (%)
Awareness towards colorectal cancer screening among the respondents	7.750	±1.914		
Colorectal cancer is among the top 3 cancers in Malaysia.				
False			36	36.0
True			64	64.0
Colorectal cancer usually starts from polyps in the colon or rectum.				
False			7	7.0
True			93	93.0
Colorectal cancer often starts without showing any symptoms.				
False			61	61.0
True			39	39.0
Screening can find colorectal cancer early when treatment can be the most effective.				
False			17	17.0
True			83	83.0
Early detection can prevent colorectal cancer.				
False			13	13.0

True	87	87.0
------	----	------

Would you prefer to have a screening test for the colorectal, even if you have no complaints, knowing that early detection may prevent colorectal cancer?

No	13	13.0
Yes	87	87.0

Which screening test would you prefer to undergo?

Fecal Occult Blood Test (FOBT)	49	49.0
Sigmoidoscopy	21	21.0
Colonoscopy	17	17.0
None	13	13.0

Earlier detection of early stage of colorectal cancer can potential lead to a complete cure of the disease.

False	33	33.0
True	67	67.0

Late detection of late stage of colorectal cancer carries poorest survival rate.

False	10	10.0
True	90	90.0

Which of the following would you prefer the most, if a colonoscopy is recommended by your doctor?

Not prefer to have test at all	22	22.0
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Will wait for 6 – 8 months for free test	57	57.0
Will pay RM800 (own money) and have a test within a week	21	21.0

4.5 Association between Socio-demographic data and Knowledge of Colorectal Cancer Screening

A Point-Biserial Correlation was used to determine the association between age and knowledge of colorectal cancer screening (CRC) among the respondents. Based on Table 4.5.1, it showed that there was no significantly associated between age and knowledge of CRC screening at p -value 0.082 (r_{pb} -0.175). A Pearson Chi-square was used to identify the association between gender, race and level of education with knowledge of CRC screening among the respondents. There was no significant association between gender and knowledge of CRC screening at p -value 0.826. The data showed that 54.3% (n=38) and 45.7% (n=32) of the females had moderate and good knowledge about CRC screening while only 43.3% (n=13) and 56.7% (n=17) of males had moderate and good knowledge of CRC screening. Besides, race and level of education showed a strong association with knowledge of CRC screening with p -value 0.007 and 0.001. The results showed Malay (n=39, 48.1%) had high knowledge regarding to CRC screening than Indian (n=8, 88.9%), Chinese (n=7, 100.0%) and other ethnicity (n=1, 33.3%). Most of the respondents (n=29, 78.4%) who received education in degree had good knowledge on CRC screening than the respondents who finished their study in Diploma (n=21, 48.8%), Certification (n=3, 30.0%) and secondary school (n=2, 20.0%).

Table 4.5.1 Association between socio-demographic data and knowledge of colorectal cancer screening among the respondents (n=100)

Variables	Knowledge of the colorectal cancer screening			χ^2	r_{pb}	<i>p</i> -value
	Poor	Moderate	Good			
	knowledge	knowledge	Knowledge			
	N (%)	N (%)	N (%)			
Age					-0.175	0.082*a
Gender				0.480		0.826*b
Male	0 (0.0%)	13 (43.3%)	17 (56.7%)			
Female	0 (0.0%)	32 (45.7%)	38 (54.3%)			
Race				12.009		0.007*b
Malay	0 (0.0%)	42 (51.9%)	39 (48.1%)			
Chinese	0 (0.0%)	0 (0.0%)	7 (100.0%)			
Indian	0 (0.0%)	1 (11.1%)	8 (88.9%)			
Others	0 (0.0%)	2 (66.7%)	1 (33.3%)			
Level of education				16.305		0.001*b
No formal education	0 (0.0%)	0 (0.0%)	0 (0.0%)			
Primary school	0 (0.0%)	0 (0.0%)	0 (0.0%)			
Secondary school	0 (0.0%)	8 (80.0%)	2 (20.0%)			
Certification(STPM/ Matriculation/ Foundation/ Others)	0 (0.0%)	7 (70.0%)	3 (30.0%)			

Diploma	0 (0.0%)	22 (51.2%)	21 (48.8%)
Bachelor	0 (0.0%)	8 (21.6%)	29 (78.4%)
Master	0 (0.0%)	0 (0.0%)	0 (0.0%)
PhD	0 (0.0%)	0 (0.0%)	0 (0.0%)

a. Point-Biserial Correlation

b. Pearson Chi-Square

* Significant at p -value <0.05

4.6 Association between Socio-demographic data and Awareness towards Colorectal Cancer

Screening

Based on the Pearson Correlation between age and awareness towards colorectal cancer screening (CRC) as shown in Table 4.6.1, there was no significant association between age and awareness towards CRC screening with p -value 0.135. Independent t-test was used to determine the association between gender with awareness towards CRC screening. From Table 4.6.1, the data showed that there was no association between gender and awareness towards CRC screening with p -value 0.533 with higher mean \pm standard deviation in males (7.933 ± 7.671) than in females (7.671 ± 1.909). Then, a One Way Independent ANOVA test was conducted to determine the association between race and educational level with awareness towards CRC screening. From Table 4.6.1, there were no significant association between race ($p = 0.086$) and level of education ($p = 0.424$) with awareness of the respondents towards CRC screening.

Table 4.6.1 Association between socio-demographic data and awareness towards colorectal cancer screening among the respondents (n=100)

Variables	Awareness towards colorectal cancer screening					p-value
	Mean±SD	df	F	t	r	
Age					-0.151	0.135*a
Gender		98	0.414			0.533*b
Male	7.933±7.671					
Female	7.671±1.909					
Race		3		2.263		0.086*c
Level of Education		3		0.941		0.424*c

a. Pearson Correlation

b. Independent T-test

c. One Way Independent ANOVA

* Significant at p -value <0.05

4.7 Association between Knowledge and Awareness towards Colorectal Cancer Screening

One Way Independent ANOVA test was used to determine the association between knowledge and awareness towards colorectal cancer (CRC) screening among the respondents. Based on Table 4.7.1, the finding showed that there was a significant between knowledge and awareness

towards CRC screening with p -value 0.001.

Table 4.7.1 One Way Independent ANOVA test between knowledge and awareness towards colorectal cancer screening

Variables	Knowledge of colorectal cancer screening			
	df	Mean square	F	p-value
Awareness towards colorectal cancer screening	1	35.670	10.717	0.001

* Significant at p -value <0.05

CHAPTER 5

DISCUSSION

The main objective of this study is aimed to determine the association between the knowledge and awareness towards colorectal cancer screening among staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. In this chapter, results from the analyzed data were discussed according to the specific objectives of this study.

5.1 Socio-demographic data among the respondents

Based on the finding in this study, the mean age of the staffs who participated in this study were 39.340, which means that the majority of the staffs were around 39 years old. Meanwhile, a study done among the general population in Norway stated that most of the respondents 1282 (64%) were from 45 to 59 years old (Knudsen et al., 2020). Besides, over 60% of the university staffs who volunteered to participate in this study were female and Malay. These was opposite with a study done in Malaysia which found that almost 50% of the public people that participated in the study were from Chinese than Malay 916 (38%), Indian 320 (13.3%) and other ethnicity 71 (3%) (Suan, Mohammed & Hassan, 2016). Then, more than 40% of the staffs in this study received Diploma as educational level. A study conducted by Suan, Mohammed and Hassan (2016) reported that more than 50% of the public people who participated in the study received tertiary education 1412 (58.6%) while 4.4% of them did not have any formal education.

5.2 Knowledge and Awareness towards Colorectal Cancer Screening

According to the results of this study, 55% (n=55) of the staffs were particularly rated as having high knowledge and 45% (n=45) of them were having moderate knowledge of the risk factors, warning signs and colorectal cancer (CRC) screening. It was because the staffs were more

exposed to a clinical training and acquired their knowledge from university curricula. Education with an evidence-based practice and knowledge about the guidelines and programs related to CRC screening among the staffs were necessary as it could increase their knowledge and improve their skills in performing CRC screening procedures. They could reach out and provide education to the community to involve and participate in CRC screening. However, the finding in this study was opposite with a previous study in Selangor which found that almost 90% of the sub-urban community had poor knowledge about risk factors for CRC (Amir Firdaus Rosli et al., 2017). About 7% of the participants were willing to seek for early check-ups on CRC (Alshammari, Alenazi and Alshammari, 2020). In this study, majority of the staffs knew and were preferred to do screening tests for CRC even though they did not develop any symptoms of CRC. Only a small proportion of the staffs in this study did not willing to do CRC screening due to some barriers and poor knowledge related to CRC and CRC screening tools. As mentioned by Althobaiti and Jradi (2019), inadequate training among the physician towards CRC screening procedures were associated with lack of knowledge about CRC risk factors and screening tests. Insufficient access to information from media, schools and public campaigns (Azeem et al., 2016) would be the major reasons that lead to low knowledge related to CRC screening tests.

Awareness towards CRC screening tests among staffs in this study were relatively good because most of the staffs were aware and volunteered to participate in CRC screening tests. A study revealed that almost 90% of the non-CRC survivors in Singapore who visited at the outpatient oncology clinic had recognized about the screening tools for CRC (Huang et al., 2019), while over 70% of the public people in Malaysia were volunteered to participate in screening procedures even though absence of CRC symptoms (Suan, Mohammed & Hassan, 2016). However, a previous study done in Jordan mentioned that most of medical students (58.4%) had low awareness about the recommendation age for CRC screening and appropriate time duration

that preferred for each CRC screening tests. It was due to insufficient health insurance coverage, lack of trained among physicians and inadequate policy towards cancer screening (Rababah, Alhassan & Al-Motlaq, 2018).

5.3 Association between Socio-demographic data and Knowledge of Colorectal Cancer

Screening

Based on the finding in this study, there was no significantly associated between age ($p= 0.082$) and gender ($p= 0.826$) with the knowledge of colorectal cancer (CRC) screening.

For age, there was a negative correlation between age and knowledge of CRC screening with $r = -0.175$, $p > 0.05$ in this study. It represented that the older age of the staffs who participate in this study, the less their knowledge on the warning signs, the risk factors and screening tests for CRC. It was supported with a study done in Malaysia by Pan et al. (2017) which found that the public people from aged 18 to 29 years old who came at the outpatient clinics had better knowledge on the warning signs and risk factors of CRC than older people. Another study conducted by Al-Naggar and Bobryshev (2013) reported that there was strong significant association between age group and the knowledge of CRC screening among young Malaysian with p -value 0.006. They stated that the person aged above 22 years old who studied in the medical university were more knowledgeable on CRC screening than person who aged below 22 years old. It was because the older participants with higher education were more exposed to knowledge on CRC screening and learned it in their study would have higher knowledge related to CRC and CRC screening tests than others.

For the gender, mostly, both female and male staffs in this study had good knowledge about the warning signs, risk factors and CRC screening tests where it represented 54.3% ($n= 38$) and 56.7% ($n=17$) respectively. However, female staffs in this study were more knowledgeable than male staffs. A study in the United Kingdom showed that the level of knowledge among females

were higher than males (Power et al., 2017). It was because women were more likely to improve their knowledge and to continue their medical education compared to men (Pietrzyk et al., 2017). Another study from Saudi Arabia conducted by Imran et al. (2016) agreed that most of the females were volunteered to participate in CRC screening due to a lot of campaigns on cancer prevention that related to breast and cervical cancer which only involved the females (Imran et al., 2016).

Regarding to this study, there was significant association between race ($p= 0.007$) and knowledge of CRC screening where the staffs from Malay ethnicity had higher knowledge than other ethnicity. A study conducted by Amir Firdaus Rosli et al. (2017) found that only 2% ($n=1$) of the Indian ethnicity from sub-urban community in Selangor had good knowledge of CRC screening. Malaysia is the multiracial country and language barriers would be a common problems between different ethnicity group. Because of that, they had poor knowledge about CRC screening due to an ineffective communication and lack of understanding regarding to CRC screening (Azeem et al., 2016).

Last but not least, in this study, there was significantly associated between educational level ($p= 0.001$) and knowledge of CRC screening. Most of the university staffs in this study who received degree had higher knowledge on CRC screening. A previous study done in Singapore reported that most of the participants who had history of cancer and higher education level were more knowledgeable and tended to participate in CRC screening (Huang et al., 2019). As studied by Althobaiti and Jradi (2019), the people who received education in medical school and had better attitude on CRC screening were associated with good knowledge of CRC screening. It was because they got latest information during their study and were more aware about the availability of the CRC screening tools.

5.4 Association between Socio-demographic data and Awareness towards Colorectal Cancer

Screening

According to the results in this study, there were no significantly associated between age ($p=0.135$), gender ($p=0.533$), race ($p=0.086$) and level of education ($p=0.424$) with awareness towards colorectal cancer (CRC) screening.

For age, there was a negative correlation between age and awareness towards CRC, $r=-0.151$, $p>0.05$. It indicated that the older age of the staffs, the poor their awareness related to CRC screening. Based on the level of education, most of the staffs in this study were aware about the existence of the CRC screening tests. A study done in the state of Qatar showed that educational level had a significant association with the awareness of CRC risk factors (Al-Dahshan et al., 2020). Al-Eid et al. (2017) reported that the higher education level of the participants, the higher their awareness about CRC screening. As studies by Knudsen et al. (2020), the participants who had higher awareness were more interested to involve themselves in the CRC screening program as it could enhance their knowledge on how to minimize their risk from developing CRC.

5.5 Association between Knowledge and Awareness towards Colorectal Cancer Screening

Regarding to the findings in this study, there was a significant between knowledge and awareness towards colorectal cancer (CRC) screening at p -value 0.001. Mostly, the staff who participated in this study knew and aware about CRC screening tests. As studied by Power et al. (2013), poor knowledge among the participants would influence on their awareness towards CRC screening. This study found that the participants had less awareness on CRC screening when they were lack of knowledge about CRC screening. In the present study, a small number of the staffs would had low knowledge and awareness towards CRC screening. During this pandemic season, they were working from home and spent more time in taking care of their

children. However, limited facilities at home and poor connection were the most reasons that cause to limited access for information through electronic media, which result to less knowledge and poor awareness related to CRC screening. Another study done by Alshammari, Alenazi and Alshammari (2020) discovered that insufficient knowledge of the screening tests, feeling of fear, no recommendation from the physician and not seeking for help were the common barriers that lead to poor awareness to involve in CRC screening procedures.

5.6 Conclusion

In conclusion, colorectal cancer (CRC) screening was used to detect pre-cancerous lesions in the early stage and to prevent from developing into an advanced stage of CRC. Regarding to this study, more than half of the staffs in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia had better knowledge and awareness about the warning signs, the risk factors and the screening tests for CRC. Even most of them knew and were aware about CRC screening, but still have existing gap in the literature about CRC screening. Because of that, by implementation of the programs, campaigns or workshops related to CRC screening among the staffs, it could gain their experience and upgrade their knowledge with the latest information related to CRC screening. Also, providing health education related to CRC screening through electronic media and providing training classes among the staffs was necessary because it could build their confidence to participate in CRC screening and improve their skills about CRC screening tests. Hence, promoting CRC screening through programs and campaigns was needed to enhance awareness of CRC screening and to reduce the incidence of cases of CRC.

CHAPTER 6

LIMITATIONS AND RECOMMENDATIONS

This chapter compromised further regarding aspects to be improved based on the results and limitations.

6.1 Limitations

There were several limitations that researcher had found in this study. First and the foremost, the researcher had a short duration of time for conducting this study. It was because the researcher should complete the research for only one semester and it was quite hard for the researcher to approach the targeted population during enhanced movement control order (EMCO). Most of the respondents were busy and working at a home during this pandemic. Besides, the data collection through online questionnaire could be one of the major limitations for respondents to participate in this study. Limitation of the facilities at home, poor connection internet and device could effect the attitude of the respondents. The respondents who were working at home or busy in taking care of their children did not have time to participate or answer the online questionnaire. Then, limitation in extending Goggle Form was another limitations in this study. It was because the researcher had difficulty to reach out the respondents who fit into inclusion criteria in this study and the researcher should wait for a month to get feedback from the respondents as many as possible for analyzing data to obtain the results of this study. Last but not least, the study group for this study was selected among the university staff from only one faculty in one university. The findings of this study might not represent the knowledge and awareness towards colorectal cancer screening for general population as it is only involved a small sample size and thus, it is not applicable for this study population.

6.2 Recommendations

There were some recommendations to increase the knowledge and awareness towards colorectal cancer screening among university staff include:

6.2.1 Education

An intervention that Universiti Putra Malaysia could provide for the staffs was by considering colorectal cancer (CRC) screening programs as a part of necessary activities in the university. Other than that, more public campaigns and workshops should be provided to the non-academic staff related to CRC screening tests. Implementation of these programs would enhance the knowledge among the staff, and increase their awareness and willingness to participate in CRC screening. Last but not least, enhancing public awareness through electronic media such as television was necessary because majority of the staff, including the community spent more time at the home during enhanced movement control order (EMCO) as they could access the information from mass media and enhance their awareness related to CRC and CRC screening procedures.

6.2.2 Practice

By handling CRC screening programs among the staffs to the community, they could empower the community through health education in the university. The university was a conducive place to learn due to its environment and facilities. The community could get latest information regarding to CRC and CRC screening tests through educational programs and campaigns. Therefore, by handling a program of CRC screening among staffs to community, they could help to gain experience and build confidence to participate in CRC screening. Considering training programs among the staffs or practitioners in the medical faculty were important as it could enhance their skills and improve their practice by following the latest guidelines for CRC

screening tools.

6.2.3 Research

Last but not least, recommendations in terms of research also could be applied in order to enhance the knowledge and awareness towards CRC screening. More research among the staffs should be done in Malaysia that focused on the CRC screening as it could fill the research gap regarding to CRC screening. Further studies with a comprehensive technique such as large sample size or face to face interview were needed as it could help to get more data or information among the staffs related to CRC screening. Including job scope in research study was needed as it could identify which population had low knowledge and awareness on CRC screening.

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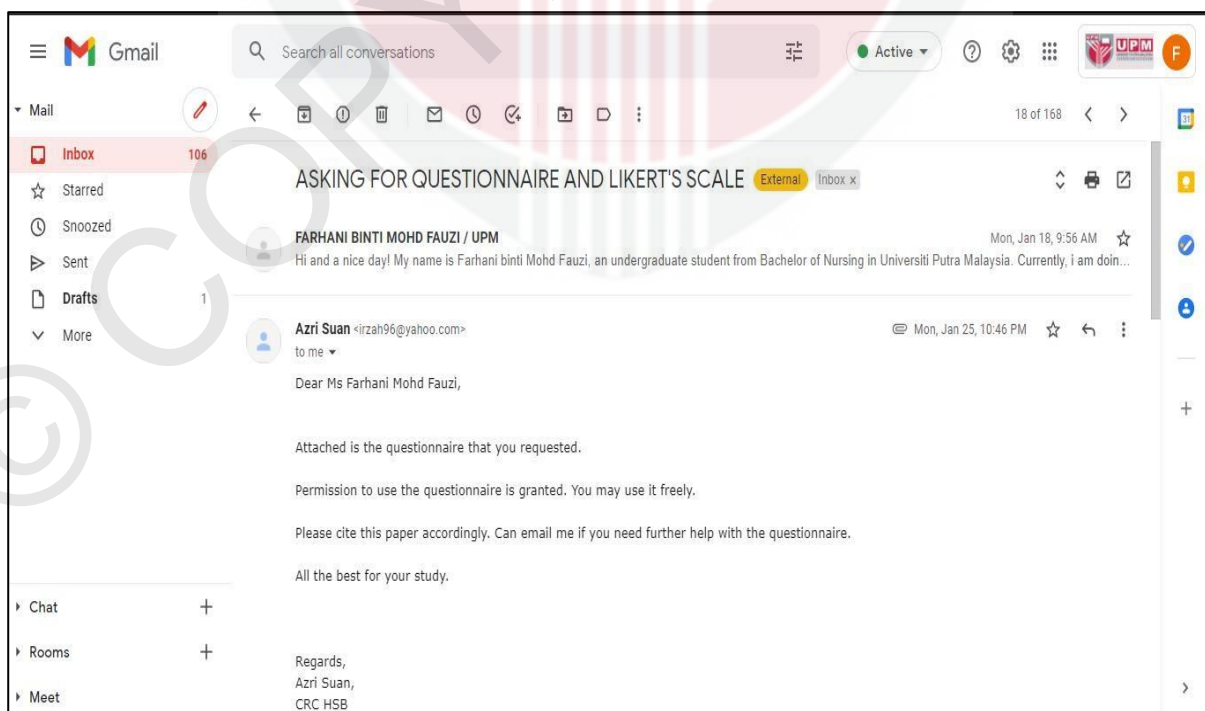
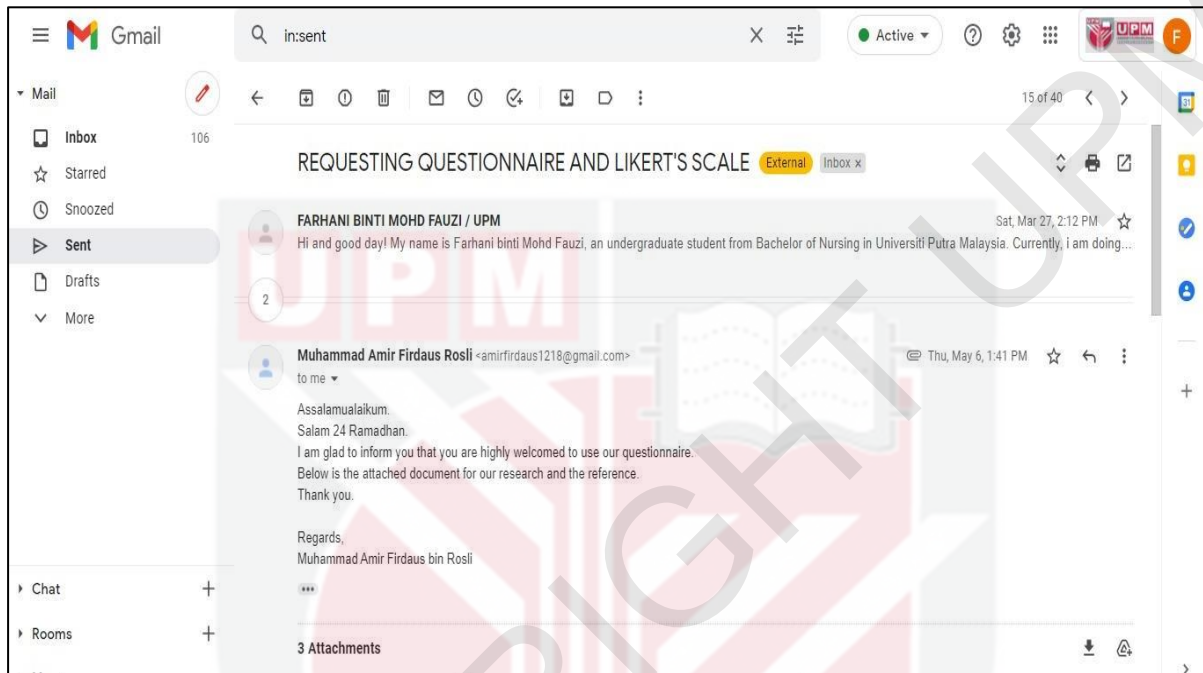
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APPENDICES

Appendix 1: Written permission for instruments



Appendix 2: Questionnaire

KNOWLEDGE AND AWARENESS TOWARDS COLORECTAL CANCER SCREENING AMONG STAFF IN THE FACULTY OF MEDICINE AND HEALTH SCIENCES, UNIVERSITI PUTRA MALAYSIA (*PENGETAHUAN DAN KESEDARAN TERHADAP SARINGAN KANSER KOLOREKTAL DALAM KALANGAN KAKITANGAN DI FAKULTI PERUBATAN DAN SAINS KESIHATAN, UNIVERSITI PUTRA MALAYSIA*)

PART A (*BAHAGIAN A*): SOCIO-DEMOGRAPHIC DATA (*DATA SOCIO-DEMOGRAFIK*)

Please answer all the questions with appropriate answer (*Sila jawab kesemua soalan dengan jawapan yang sesuai*)

1. Age (*Umur*):

2. Gender (*Jantina*): Male (*Lelaki*) Female (*Perempuan*)

3. Race (*Kaum*): Malay (*Melayu*)
 Chinese (*Cina*)
 Indian (*India*)
 Others (*Lain-lain*):

4. Level of education (*Tahap pendidikan*):

No formal education (*Tidak berpendidikan*)

Primary school (*Sekolah rendah*)

Secondary school (*Sekolah Menengah*)

Certification (STPM/ Diploma/ Matriculation/ Foundation/ Others) (*STPM/ Diploma/ Matrikulasi/ Asasi/ Lain-lain*)

Bachelor (*Ijazah*)

Master (*Ijazah Sarjana*)

Ph.D. (*Doktor Falsafah*)

PART B (BAHAGIAN B): KNOWLEDGE OF COLORECTAL CANCER SCREENING

(PENGETAHUAN MENGENAI SARINGAN KANSER KOLOREKTAL)

Please answer all the questions with appropriate answer (*Sila jawab kesemua soalan dengan jawapan yang sesuai*)

1. What is the warning signs for colorectal cancer? (*Apakah tanda amaran bagi kanser kolorektal?*)

Warning signs of colorectal cancer (<i>Tanda amaran bagi kanser kolorektal</i>)	True (<i>Benar</i>)	False(<i>Salah</i>)
a. Bleeding from the back passage (<i>Pendarahan semasa membuang air besar</i>)		
b. Change in bowel habits (<i>Perubahan tabiat membuang air besar</i>)		
c. Persistent pain in the abdomen (<i>Sakit perut/ abdomen yang berterusan</i>)		
d. Feeling that the bowel does not completely empty (<i>Rasa pembuangan air besar tidak lawas</i>)		
e. Blood in the stools (<i>Najis berdarah</i>)		
f. Continuously pain in the back passage (<i>Sakit di bahagian dubur yang berterusan</i>)		
g. Lump in the abdomen (<i>Sebarang benjol atau ketumbuhan di bahagian perut</i>)		
h. Tiredness/ anaemia [<i>Keletihan atau kekurangan darah</i>]		
i. Sudden weight loss (<i>Penurunan berat badan secara mendadak</i>)		

2. What is the risk factors for colorectal cancer? (*Apakah faktor risiko untuk kanser kolorektal?*)

Risk factors for colorectal cancer (<i>Faktor risiko untuk kanser kolorektal</i>)	True (<i>Benar</i>)	False (<i>Salah</i>)
a. Age factor (above 50 years old) [<i>Faktor usia (lebih 50 tahun)</i>]		
b. Family history of colorectal cancer (<i>Sejarah keluarga mempunyai kanser kolorektal</i>)		

c. Eating less than 5 portions of fruit and vegetables a day (<i>Makan kurang daripada 5 sajian buah-buahan/ sayur-sayuran setiap hari</i>)		
d. Eating red or processed meat once a day or more (<i>Makan daging merah/ daging diproses sekali atau lebih dalam sehari</i>)		
e. Having a diet low in fibre (<i>Kurang serat dalam menu harian</i>)		
f. Smoking and alcohol consumption (<i>Merokok dan pengambilan arak</i>)		
g. Lack of physical activity (<i>kekurangan aktiviti fizikal</i>)		
h. Having bowel disease (<i>Penyakit usus</i>)		
i. Having diabetes (<i>Menghidapi penyakit kencing manis</i>)		
j. Having cervical cancer, breast or ovary [<i>Menghidapi barah rahim, payudara atau ovari</i>]		
k. Being overweight (<i>Berat badan berlebihan</i>)		

3. What is the screening procedure for colorectal cancer that you know? (*Apakah prosedur saringan bagi kanser kolorektal yang anda ketahui?*)

Screening procedure for colorectal cancer (<i>Prosedur saringan untuk kanser kolorektal</i>)	True (<i>Benar</i>)	False (<i>Salah</i>)
a. Fecal Occult Blood Test (<i>Ujian Darah Okkult Najis</i>)		
b. Colonoscopy (<i>Kolonoskopi</i>)		
c. Sigmoidoscopy (<i>Sigmoidoskopi</i>)		

4. What is the starting age to participate in the colorectal cancer screening procedure? (*Berapakah usia permulaan untuk menyertai prosedur saringan kanser kolorektal?*)

5. What is the appropriate time interval to undergo a colorectal cancer screening procedure? (*Apakah selang masa yang sesuai untuk menjalani prosedur saringan kanser kolorektal?*)

Appropriate time to undergo colorectal cancer screening procedure (<i>Selang masa yang sesuai untuk menjalani prosedur saringan kanser kolorektal</i>)	True (<i>Benar</i>)	False (<i>Salah</i>)
a. Fecal Occult Blood Test- 1 year interval (<i>Ujian Darah Okkult Najis - selang setahun</i>)		
b. Sigmoidoscopy- 5 year interval (<i>Sigmoidoskopi - selang 5 tahun</i>)		
c. Colonoscopy- 10 year interval (<i>Kolonoskopi - selang 10 tahun</i>)		

6. How many stool samples are needed for the Fecal Occult Blood Test? (*Berapakah sampel najis yang diperlukan untuk Ujian Darah Okkult Najis?*)
-
7. What should be done the day before having a colonoscopy? (*Apakah yang perlu dibuat sehari sebelum menjalani kolonoskopi?*)

	True (<i>Benar</i>)	False (<i>Salah</i>)
a. Drink only water (<i>Minum air sahaja</i>)		
b. Eat only fiber and protein sources (<i>Makan sumber serat dan protein sahaja</i>)		
c. Avoid eating a lot of starch sources (<i>Elakkan makan banyak sumber kanji</i>)		
d. Take laxative medicine according to your doctor's instructions (<i>Ambil ubat pelawas mengikut arahan doktor</i>)		
e. Full fast from midnight (<i>Puasa penuh dari tengah malam</i>)		

PART C (BAHAGIAN C): AWARENESS TOWARDS COLORECTALCANCER SCREENING (KESEDARAN TERHADAP SARINGAN KANSER KOLOREKTAL)

Tick (/) all the questions with appropriate answer (*Tanda (/) kesemua soalan dengan jawapan yang sesuai*)

1. Colorectal cancer is among the top 3 cancers in Malaysia. (*Kanser kolorektal adalah di antara 3 kanser paling umum di kalangan rakyat Malaysia.*)

True (*Benar*) False (*Salah*)

2. Colorectal cancer usually starts from polyps in the colon or rectum. (*Kanser kolorektal biasanya bermula dengan polip di dalam kolon atau rektum.*)

True (*Benar*) False (*Salah*)

3. Colorectal cancer often starts without showing any symptoms. (*Kanser kolorektal biasanya bermula tanpa menunjukkan sebarang simptom/tanda.*)

True (*Benar*) False (*Salah*)

4. Screening can find colorectal cancer early when treatment can be the most effective. *(Saringan boleh mengesan kanser kolorektal dengan lebih awal, di mana rawatan boleh menjadi paling efektif.)*

True (Benar) False (Salah)

5. Early detection can prevent colorectal cancer. *(Pengesanan awal boleh mencegah kanser kolorektal.)*

True (Benar) False (Salah)

6. Would you prefer to have a screening test for the colorectal, even if you have no complaints, knowing that early detection may prevent bowel cancer? *(Adakah anda sanggup menjalani ujian saringan kolorektal, walaupun anda tiada sebarang aduan, tetapi anda mengetahui bahawa pengesanan awal boleh mencegah kanser kolorektal?)*

Yes (Ya) No (Tidak)

7. Which screening test would you prefer to undergo? *(Ujian manakah yang anda ingin lakukan?)*

Faecal occult blood test (no visualisation of the bowel, 3 faecal samples from each 3 consecutive stools are examined for the presence of blood and diet restriction is necessary before the test. It is a non-invasive technique and does not cause any discomfort). This simple test can detect up to **25%** of colorectal cancer. *[Ujian Darah Okult Najis (3 sampel najis daripada 3 pembuangan air besar berturutan akan diperiksa untuk kandungan darah dalam najis yang tidak dapat dilihat dengan mata kasar. Diet terhad adalah perlu sebelum ujian. Ujian ini tidak menyebabkan ketidakselesaan.) Ujian ini boleh mengesan sehingga 25% kanser kolorektal.]*

Sigmoidoscopy test (direct visualisation of the bowel using soft tube with camera. The tube will be inserted through anal opening and lesion encountered can be biopsied during the test. The disadvantage is that about 50% of cancers will be beyond the reach of the sigmoidoscope and the procedure involves some discomfort, risk and inconvenience to the patients.) This test can detect up to **50%** of colorectal cancer. *[Ujian Sigmoidoskopi (Pemerhatian terus ke dalam usus menggunakan tiub lembut yang mempunyai kamera. Tiub ini dimasukkan melalui dubur dan sebarang keabnormalan dalam usus boleh dibiopsikan. Kelemahan ujian ini ialah lebih kurang 50% kanser tidak dapat dikesan oleh sigmoidoskop. Prosedur ini melibatkan sedikit ketidakselesaan dan risiko.) Ujian ini boleh mengesan sehingga 50% kanser kolorektal.]*

Colonoscopy test (direct visualisation of the bowel using soft tube with camera. The tube will be inserted through anal opening and lesion encountered can be biopsied during the test. Very invasive test and procedure involve some discomfort and inconvenience to the patients. Bowel also needs to be cleaned prior to the test and this procedure requires sedation during the test.) This can detect up to **95%** of colorectal cancer. [*Ujian Kolonoskopi (pemerhatian terus ke dalam usus menggunakan tiub lembut yang mempunyai kamera. Tiub ini dimasukkan melalui dubur dan sebarang keabnormalan dalam usus boleh dibiopsikan. Prosedur ini melibatkan sedikit ketidakselesaan kepada pesakit. Usus perlu dibersihkan sebelum menjalani ujian dan pesakit perlu dibius sepanjang ujian.) Ujian ini boleh mengesan sehingga 95% kanser kolorektal.*]

None (*Tiada*)

8. Earlier detection of early stage of colorectal cancer can potentially lead to a complete cure of the disease. (*Pengesanan awal kanser kolorektal pada peringkat awal boleh membawa kepada penyembuhan sepenuhnya.*)

True (*Benar*) False (*Salah*)

9. Late detection of late stage of colorectal cancer carries poorest survival rate. (*Pengesanan pada peringkat lewat kanser kolorektal menyebabkan kadar kelangsungan hidup yang rendah.*)

True (*Benar*) False (*Salah*)

10. Which of the following would you prefer the most, if a colonoscopy is recommended by your doctor? (choose only ONE) [*Manakah di antara berikut yang anda cenderung untuk memilih tentang ujian kolonoskopi jika dinasihatkan oleh doktor anda? (pilih SATU sahaja)*]

Will pay RM800 (own money) and have a test within a week (*Bayar RM800 (wang sendiri) dan jalani ujian dalam masa seminggu*)

Will wait for 6 – 8 months for free test (*Tunggu 6-8 bulan untuk ujian percuma*)

Not prefer to have test at all (*Tidak cenderung untuk menjalani ujian*)

Appendix 3: Information Sheet and Consent Form (English and Malay)



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

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

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

- 1. STUDY TITLE :** Knowledge and Awareness towards Colorectal Cancer Screening among Staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia
- 2. INTRODUCTION:** Colorectal cancer is the third most common cancer in men and women. Early screening is important for the early detection and prevention of developing colorectal cancer.

3. WHAT WILL YOU HAVE TO DO?

The questionnaire will be given individually to the staff in the Faculty of Medicine and Health Sciences, Universiti Putra Malaysia. The participants have to fulfill all the inclusion criteria and sign the agreement to participate in this study. All information will be collected by the researcher based on socio-demographic data, knowledge, and awareness towards colorectal cancer screening through the questionnaire in this study. The participants need to answer all the questions in each part of the questionnaire for at least 15-30 minutes. Cooperation from the participants in this study is highly appreciated.

4. WHO SHOULD NOT PARTICIPATE IN THE STUDY?

The staff that has history of colorectal cancer, staff has family history of colorectal cancer and staff is on long medical leave will be excluded from this study.

5. WHAT WILL BE THE BENEFITS OF THE STUDY:

(a) TO YOU AS THE SUBJECT?

There is no benefit throughout this study but all participants that participate in this study will increase their knowledge and awareness towards colorectal cancer screening.

(b) TO THE INVESTIGATOR?

All data that is collected from this study will be used to increase the knowledge and awareness towards colorectal cancer screening among staff in Faculty of Medicine and Health Sciences, Universiti Putra Malaysia.

6. WHAT ARE THE POSSIBLE RISKS?

There is no risk to the participants in this study.

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

All the information of the participants will be kept confidential. Only the researcher and the supervisor are allowed to assess the information that will be collected in this study.

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

If you have any inquiries or want to know further development of the research, you can contact me during working hours or my supervisor.

Yours sincerely,

Farhani Binti Mohd Fauzi

Student researcher,

Department of Nursing,

Faculty of Medicine and Health Sciences,

Universiti Putra Malaysia,

43400 UPM Serdang,

Selangor, Malaysia.

Phone: +6011-29292842

Email: 193335@student.upm.edu.my

Rosna Binti Abdul Raman

Supervisor,

Department of Nursing,

Faculty of Medicine and Health Sciences,

Universiti Putra Malaysia,

43400 UPM Serdang,

Selangor, Malaysia.

Phone: +019-3883844

Email: rosnaar@upm.edu.my

Dr. Ruthpackiavathy A/P Rajen Durai

Co-Supervisor,

Department of Nursing,

Faculty of Medicine and Health Sciences,

Universiti Putra Malaysia,

43400 UPM Serdang,

Selangor, Malaysia.

Phone: +603-97692429

Email: ruthpackiavathy@upm.edu.my

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

9. CONSENT

I Identity Card No.
 address.....

...

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

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

I* wish / do not wish to know the results related to my participation in the research

I agree/do not agree that the images/photos/video recordings/voice recordings related to me be used in any form of publication or presentation (if applicable)

* delete where necessary

Signature Signature
 (Respondent) (Witness)

Date :..... Name :.....

I/C No. :.....

I confirm that I have explained to the respondent the nature and purpose of the above-mentioned research.

Date Signature
 (Researcher)



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

BORANG 2.4: PENERANGAN DAN PERSETUJUAN RESPONDEN

Sila baca maklumat berikut dengan teliti. Sekiranya anda mempunyai sebarang pertanyaan, sila kemukakan kepada penyelidik.

1. TAJUK KAJIAN:

Pengetahuan dan Kesedaran terhadap Saringan Kanser Kolorektal dalam kalangan kakitangan di Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia.

2. PENGENALAN

Kanser kolorektal adalah kanser yang paling biasa pada lelaki dan wanita. Saringan awal penting untuk pengesanan awal dan pencegahan penyakit kanser kolorektal.

3. APAKAH YANG PERLU ANDA LAKUKAN?

Soal selidik akan diberikan secara individu kepada kakitangan di Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia. Peserta harus memenuhi semua kriteria kemasukan dan menandatangani perjanjian untuk mengambil bahagian dalam kajian ini. Semua maklumat akan dikumpulkan oleh pengkaji berdasarkan data sosio-demografi, pengetahuan, dan kesedaran terhadap saringan kanser kolorektal melalui soal selidik dalam kajian ini. Peserta perlu menjawab semua soalan di setiap bahagian soal selidik sekurang-kurangnya 15-30 minit. Kerjasama dari para peserta dalam kajian ini sangat dihargai.

4. SIAPA YANG TIDAK BOLEH MENYERTAI KAJIAN INI?

Kakitangan yang mempunyai sejarah kanser kolorektal, kakitangan yang mempunyai sejarah keluarga yang menghidap kanser kolorektal dan kakitangan yang bercuti perubatan yang panjang akan dikecualikan dari kajian ini.

5. APAKAH FAEDAH MENYERTAI KAJIAN INI?

a) KEPADA ANDA SEBAGAI PESERTA?

Tidak ada manfaat sepanjang kajian ini tetapi semua peserta yang mengambil bahagian dalam kajian ini akan meningkatkan pengetahuan dan kesedaran mereka terhadap saringan kanser kolorektal.

b) KEPADA PENYELIDIK?

Semua data yang dikumpulkan dari kajian ini akan digunakan untuk meningkatkan pengetahuan dan kesedaran mengenai saringan kanser kolorektal dalam kalangan kakitangan di Fakulti Perubatan dan Sains Kesihatan, Universiti Putra Malaysia.

6. ADAKAH IA BERISIKO?

Tiada risiko bagi peserta dalam kajian ini.

7. ADAKAH MAKLUMAT DAN IDENTITI SAYA KEKAL RAHSIA?

Semua maklumat peserta akan dirahsiakan. Hanya penyelidik dan penyelia yang dibenarkan menilai maklumat yang dikumpulkan dalam kajian ini.

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

Sekiranya anda mempunyai pertanyaan atau ingin mengetahui perkembangan penyelidikan lebih lanjut, anda boleh menghubungi saya semasa waktu bekerja atau penyelia saya.

Yang Benar,

Farhani Binti Mohd Fauzi

Penyelidik pelajar,

Jabatan Kejururawatan,

Fakulti Perubatan dan Sains Kesihatan,

Universiti Putra Malaysia,

43400 UPM Serdang,

Selangor, Malaysia

No. Telefon: +6011-29292842

Emel: 193335@student.upm.edu.my

Rosna Binti Abdul Raman,
Penyelia
Jabatan Kejururawatan,
Fakulti Perubatan dan Sains Kesihatan,
Universiti Putra Malaysia,
43400 UPM Serdang,
Selangor, Malaysia
No. Telefon: +019-3883844
Email: rosnaar@upm.edu.upm

Dr. Ruthpackiavathy A/P Rajen Durai
Penyelia Bersama
Jabatan Kejururawatan,
Fakulti Perubatan dan Sains Kesihatan,
Universiti Putra Malaysia,
43400 UPM Serdang,
Selangor, Malaysia
No. Telefon: +603-97692429
Emel: ruthpackiavathy@upm.edu.my

© Sila tandatangan di sini sekiranya anda telah membaca dan memahami kandungan halaman ini _____

9. PERSETUJUAN

Saya.....No Kad Pengenalan.....
beralamat.....
.....dengan ini bersetuju untuk mengambil bahagian secara sukarela dalam penyelidikan yang tersebut di atas *(kajian klinikal/percubaan ubat-ubatan/rakaman video/kumpulan sasaran/temuduga/ soal selidik).

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

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

*potong yang tidak berkenaan

Tandatangan Tandatangan
(Responden) (Saksi)

Tarikh : Nama :

No. K/P:

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

Tarikh Tandatangan
(Penyelidik)

Appendix 4: Permission Approval from UPM Ethical Committee for Research Involving Human Subject (JKEUPM)

Ref. no: UPM/TNCPI/RMC/JKEUPM/1.4.18.2 (JKEUPM)

Date: 22 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 and Awareness Towards Colorectal Cancer Screening among Staff in the Faculty of Medicine and Health Sciences, 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-2021-090**

Thank you.

Yours faithfully,

Prof. Dr. Zamberi Sekawi

Chair

Ethics Committee for Research Involving Human Subjects

Universiti Putra Malaysia

Appendix 5: Gantt chart

No	Year	2020	2021										
		Dec	Jan	Feb	April	May	June	July	Aug	Sep	Oct	Nov	
1.	Project implementation plan write up												
2.	Ethics application												
3.	Conduct a pilot study												
4.	Data collection												
5.	Data analysis												
6.	Meeting and writing for thesis												
7.	Final presentation												
8.	Thesis submission												