KNOWLEDGE AND PRACTICE OF COLORECTAL CANCER SCREENING AMONG PRIMARY CARE PHYSICIANS IN THE PUBLIC PRIMARY CARE SETTING

OOI CHOR YAU

DISSERTATION SUBMITTED IN FULFILMENT OF THE REQUIREMENTS FOR THE DEGREE OF MASTER OF FAMILY MEDICINE

2014
ACKNOWLEDGMENTS

I would like to take this opportunity to thank my supervisors Associate Professor Dr. Nik Sherina and Associate Professor Dr. Liew Su May for their constant guidance and support to me on this research. I would also like to thank my family members for supporting me in this research project. Last but not least, I would like to thank my God for His spiritual strength in helping me to complete this research.
ABSTRACT

**Background:** Colorectal cancer is a major cause of morbidity and mortality worldwide. It is the second commonest cancer in Malaysia. Colorectal cancer screening is effective in reducing the mortality and incidence of colorectal cancer. Primary care physicians play a vital role in promoting and giving the right recommendations for screening according to guidelines.

**Aim:** To assess the knowledge and practice of colorectal cancer screening among primary care physicians in the primary care setting.

**Methods:** This is a cross sectional study conducted in public primary care clinics in the Federal Territory of Kuala Lumpur. It involved 13 government clinics and two primary care clinics from academic centres. A self-administered questionnaire was used to assess the knowledge and practice of colorectal cancer screening. The main outcomes of this study: a) Knowledge of colorectal cancer risk stratification; b) Knowledge of colorectal cancer screening modalities; c) Practice of colorectal cancer screening; d) Known facilitators and barriers influencing colorectal cancer screening.

**Results:** The response rate was 87.2% (197). Less than half (39.1%) got all scenarios correct for colorectal cancer risk stratification. The mean knowledge score was 48.7% ± 17.7%. The knowledge score was positively associated with having a postgraduate qualification and usage of screening guidelines. About 70% of physicians reported practice screening but of these, nearly two thirds (74%) screened less than 50% of eligible patients. Physicians who agreed that screening is cost effective (OR = 3.34, 95% CI 1.69-6.59) and that they have adequate resources in their vicinity were more likely to practice screening (OR = 1.92, 95% CI 1.01-3.68). Knowledge score was not associated with practice of screening (p = 0.185)
Conclusion: The findings showed that knowledge of screening did not translate into practice. Physicians' perception about cost effectiveness and adequate resources are important determinants to practice screening.
# TABLE OF CONTENTS

<table>
<thead>
<tr>
<th>CONTENT</th>
<th>PAGE</th>
</tr>
</thead>
<tbody>
<tr>
<td>ABSTRACT</td>
<td>1</td>
</tr>
<tr>
<td>TABLE OF CONTENTS</td>
<td>3</td>
</tr>
<tr>
<td>LIST OF TABLES</td>
<td>6</td>
</tr>
<tr>
<td>LIST OF FIGURES</td>
<td>7</td>
</tr>
<tr>
<td>ABBREVIATION</td>
<td>8</td>
</tr>
<tr>
<td>CHAPTER 1: INTRODUCTION</td>
<td>9</td>
</tr>
<tr>
<td>CHAPTER 2: LITERATURE REVIEW</td>
<td>11</td>
</tr>
<tr>
<td>2.1 Epidemiology of colorectal cancer</td>
<td>11</td>
</tr>
<tr>
<td>2.2 Impact of colorectal cancer screening</td>
<td>11</td>
</tr>
<tr>
<td>2.3 Risk stratification of colorectal cancer</td>
<td>13</td>
</tr>
<tr>
<td>2.4 Colorectal cancer guidelines</td>
<td>14</td>
</tr>
<tr>
<td>2.5 Colorectal cancer screening modalities</td>
<td>16</td>
</tr>
<tr>
<td>2.6 Impact of primary care physicians on colorectal cancer screening</td>
<td>19</td>
</tr>
<tr>
<td>2.6.1 Knowledge on colorectal cancer screening</td>
<td>20</td>
</tr>
<tr>
<td>2.6.2 Facilitators and barriers to colorectal cancer screening</td>
<td>20</td>
</tr>
<tr>
<td>2.7 Justification of research</td>
<td>21</td>
</tr>
<tr>
<td>CHAPTER 3: OBJECTIVES</td>
<td>22</td>
</tr>
<tr>
<td>3.1 General Objectives</td>
<td>22</td>
</tr>
<tr>
<td>3.2 Specific Objectives</td>
<td>22</td>
</tr>
<tr>
<td>CHAPTER 4: METHODOLOGY</td>
<td>23</td>
</tr>
<tr>
<td>4.1 Study design</td>
<td>23</td>
</tr>
<tr>
<td>4.2 Setting</td>
<td>23</td>
</tr>
<tr>
<td>4.3 Study population</td>
<td>23</td>
</tr>
</tbody>
</table>
4.4 Inclusion and exclusion criteria

4.5 Sampling

4.6 Research instrument
4.6.1 Questionnaire design
4.6.2 Questionnaire validation and pilot testing

4.7 Method of data collection

4.8 Statistical analysis

4.9 Ethics approval

CHAPTER 5: RESULTS

5.1 Study recruitment process

5.2 Sociodemographic profile
5.2.1 Participants' characteristics
5.2.2 Usage of guidelines by participants
5.2.3 Daily patients attendance

5.3 Knowledge on risk stratification of colorectal cancer screening among primary care physicians

5.4 Knowledge of primary care physicians on colorectal cancer screening modalities
5.4.1 Knowledge of primary care physicians on colorectal cancer screening modalities for average risk patients
5.4.2 Knowledge of primary care physicians on colorectal cancer screening for high risk patients

5.5 Knowledge score of primary care physicians on colorectal cancer screening modalities

5.6 Association between knowledge score on colorectal cancer screening modalities and sociodemographic profile of primary care physicians
CHAPTER 6: DISCUSSION

6.1 Response rate

6.2 Sociodemographic profile
   6.2.1 Characteristics of participants
   6.2.2 Usage of guidelines
   6.2.3 Daily patient volume

6.3 Knowledge on risk stratification of colorectal cancer screening among primary care physicians

6.4 Knowledge of primary care physicians on colorectal cancer screening modalities for average risk patients

6.5 Knowledge of primary care physicians on colorectal cancer screening for high risk patients

6.6 Knowledge score of primary care physicians on colorectal cancer screening modalities and its associations

6.7 Practice of colorectal cancer screening among primary care physicians

6.8 Screening modalities for colorectal cancer screening

6.9 Perceived barriers and facilitators influencing decisions for colorectal cancer screening

6.10 Factors influencing primary care physicians to practice colorectal cancer screening
6.11 Strengths of this study 70
6.12 Limitations of this study 70
6.13 Recommendations 70

CHAPTER 7: CONCLUSION 72

REFERENCES 73

APPENDICES

Appendix 1: Questionnaire in knowledge and practice of colorectal cancer screening 79
Appendix 2: Participant information sheet 85
Appendix 3: Consent form 87
Appendix 4: Ethics approval (University) 88
Appendix 5: Ethics approval (Ministry of Health) 89
Appendix 6: Permission letter (National Medical Research Registry) 90

LIST OF TABLES

Table 1. Colorectal cancer risk stratification 14
Table 2. Summary of guidelines 15
Table 3. Sensitivity and specificity of different colorectal cancer screening modalities 16
Table 4. Participants’ place of practice 33
Table 5. Sociodemographic profile 34
Table 6. Usage of guidelines by participants 36
Table 7. Number of patients seen by participants in one day 37
Table 8. Primary care physicians’ knowledge on risk stratification of colorectal cancer screening 39
Table 9. Knowledge of physicians on different colorectal cancer screening 42
modalities

Table 10. Knowledge of physicians on colorectal cancer screening for high risk patients

Table 11. Association between knowledge score and sociodemographic profile of primary care

Table 12. Factors associated with knowledge score

Table 13. Practice of colorectal cancer

Table 14. Perceived barriers and facilitators influencing decision for colorectal cancer screening

Table 15. Association between sociodemographic profile, practice characteristics, knowledge score and screening practice

Table 16. Association between perceived barriers and facilitators influencing decision for colorectal cancer screening and screening practice

Table 17. Logistic regression analysis: factors influencing primary care physicians to practice screening

LIST OF FIGURES

Figure 1. Flowchart of participant recruitment

Figure 2. Primary care physicians’ correct response on colorectal cancer screening risk stratification

Figure 3. Knowledge score of primary care physicians on colorectal cancer screening modalities

Figure 4. Screening modalities most frequently used for colorectal cancer screening
ABBREVIATION

CRC : Colorectal cancer

KK : Klinik Kesihatan

FAP : Familial adenomatous polyposis

HNPCC: Hereditary nonpolyposis colorectal cancer

IBD : Inflammatory bowel disease

FOBT : Faecal occult blood test

DCBE : Double contrast barium enema

CEA : Carcinoembryonic antigen

USPSTF: United States Preventive Service Task Force

PPUM : Pusat Perubatan Universiti Malaya

HUKM: Hospital Universiti Kebangsaan Malaysia

SD : Standard deviation
CHAPTER 1: INTRODUCTION

Colorectal cancer is the third most commonly diagnosed cancer worldwide in year 2008 (1.23 million cases, 9.7%). It is the second most common cancer in women and third most common cancer in men worldwide.\(^1\) In Malaysia, colorectal cancer is the second commonest cancer (12.7%) with only 37% of the cases diagnosed at stage one and two.\(^2\)

Colorectal cancer screening has been shown to be effective in reducing the mortality and incidence of colorectal cancer. A large prospective study carried out in Japan reported a 70% reduction in colorectal cancer mortality.\(^3\) Similarly in the United States, there has been a steadily declining rate of colorectal cancer incidence due to extensive screening.\(^4\)

However, despite the availability of screening programmes, uptake of screening is still low. A multicentre study conducted in the Asia-Pacific region reported that only 27% of patients had previously undergone screening.\(^5\) In the United States, the screening rate is about 50%.\(^6\)

Primary care physicians (physicians) play a very important role in colorectal cancer screening. Many studies have shown that physician recommendation is a strong predictor of screening participation in patients.\(^5,\,7,\,8\) There are many factors that influence physicians' decision in recommending screening.\(^7\)

In Malaysia, there are no current guidelines in colorectal cancer screening. The previous guideline was published in 2001. A local study reported less than 1% of population ever had colorectal cancer screening done.\(^9\) Another local study reported 84.6% of patients would undergo screening if advised by their primary care providers.\(^8\) In view of this, a pilot programme for screening was started in January 2014 by the
Ministry of Health Malaysia in Kuala Lumpur. Eight of the clinics that were involved in this study are running the screening programme. These clinics were KK Jinjang, KK Batu, KK Sentul, KK Cheras, KK Cheras Baru, KK Setapak, KK Kg Pandan and KK Tanglin. The screening test that is used is immunochemical FOBT (iFOBT). Patients with positive results on screening would be referred to General Hospital Kuala Lumpur or other hospitals with colonoscopy facility for further evaluation. Selected health personnel were sent from each of the clinics for training on this programme.

Therefore, this study was conducted to assess the knowledge and practice of colorectal cancer screening among primary care physicians to identify knowledge gaps and determine screening practice.
CHAPTER 2: LITERATURE REVIEW

2.1 Epidemiology of colorectal cancer

Colorectal cancer is the second commonest cancer in Malaysia after breast cancer. According to the National Cancer Registry Report 2007, 12.7% of cancer reported was colorectal cancer.\(^2\) The incidence of colorectal cancer in male is 13.4 per 100,000 population compared to females (10.2 per 100,000 population) and with the highest incidence in the Chinese.\(^2\) The prevalence of colorectal cancer has over taken cervical cancer in women.

According to a worldwide survey in 2008, colorectal cancer is the third most common cancer in men (663,000 cases, 10.0% of the total) and the second in women (570,000 cases, 9.4% of the total) worldwide.\(^1\) Colorectal cancer is the fourth most common cause of death from cancer with an estimated 608,000 deaths worldwide in year 2008.\(^1\) In Asia countries, the incidence and mortality rates are rising in most countries especially in Japan, South Korea and Singapore with the incidence rate similar to western countries.\(^10,11\)

2.2 Impact of colorectal cancer screening

Colorectal cancer screening has been shown to be effective in reducing the incidence and mortality of colorectal cancer. This is because the pathogenesis of colorectal cancer is well established. It has long been known that colorectal cancer arises from premalignant adenomatous polyp.\(^12\) Therefore, the strategy of colorectal cancer screening is to detect early adenomatous polyp or early stage adenocarcinoma.\(^13\) Early detection of adenomatous polyp and removal has shown a reduction of 53% in mortality rate from colorectal cancer.\(^14\)
According to Wilson’s and Jungner’s criteria for screening, the disease screened must be an important condition with recognizable latent phase and natural history of the disease well established. The test for screening should be acceptable to the population and screening can be done continuously (not just once off). There must also be accepted treatment for the disease once it is diagnosed. The cost of the screening should be economically balanced in relation to possible expenditures on medical care as a whole. The screening of colorectal cancer fulfils the screening criteria.

Colorectal cancer screening was started in the United States in the 1970s and 1980s. Due to its implementation, colorectal cancer incidence and mortality has shown a decline. Many published trials had shown the effectiveness of screening modalities in reducing the incidence and mortality of colorectal cancer.

However, not many countries has colorectal cancer screening programme available. In Asia, only Japan has a colorectal cancer programme that has been running since 1992. Australia, South Korea and Singapore have their own national guidelines and have started to implement pilot programmes for screening. However, many other countries do not have any proper guidelines or programme in place for screening. In Malaysia, a study done showed only 0.7% of patients underwent screening. The last available guideline for screening was in year 2001 and had yet to be updated. Another local study reported that only 12.9% of primary care providers routinely ordered faecal occult blood test (FOBT). Because of this, the Ministry of Health sees the need for colorectal cancer programme to be implemented and a pilot programme has been started since January 2014.
2.3 Risk stratification for colorectal cancer screening

Risk stratification is used to determine the appropriate mode of screening for the individual patient. Patients are categorized according to average risk, moderate risk and high risk based on their age, medical history and family history (Table 1). Other risk factors for colorectal cancer are smoking, obesity and increased red meat consumption.\textsuperscript{4, 10, 22}

Table 1. Colorectal cancer risk stratification\textsuperscript{23}

<table>
<thead>
<tr>
<th>Risk level</th>
<th>Percentage of all colorectal cancer cases</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>High risk</strong></td>
<td></td>
</tr>
<tr>
<td>Family history of familial adenomatous polyposis (FAP)</td>
<td>1%</td>
</tr>
<tr>
<td>Family history of hereditary nonpolyposis colorectal cancer (HNPCC)</td>
<td>3 - 5%</td>
</tr>
<tr>
<td>Personal history of inflammatory bowel disease (IBD)</td>
<td>&lt; 1%</td>
</tr>
<tr>
<td><strong>Moderate risk</strong></td>
<td></td>
</tr>
<tr>
<td>Familial risk/first degree with history of colorectal cancer</td>
<td>15 -20%</td>
</tr>
<tr>
<td>Personal history of breast, uterine or ovarian cancer</td>
<td>&lt; 1%</td>
</tr>
<tr>
<td><strong>Average risk</strong></td>
<td></td>
</tr>
<tr>
<td>Age more than 50 years old</td>
<td>70 - 75%</td>
</tr>
</tbody>
</table>
2.4 Colorectal cancer guidelines

Currently, there are many colorectal cancer guidelines available. At the moment, the Malaysia guideline for colorectal cancer screening had yet to be updated since year 2001. Few of the guidelines are summarized in Table 2. For the patient at average risk, the recommendations from all the guidelines generally concur. The recommended starting age for screening is 50 years and the recommended tests are faecal occult blood test (FOBT), flexible sigmoidoscopy and colonoscopy. Additional tests like computed tomography (CT) colonography and double contrast barium enema (DCBE) are recommended by the American Cancer Society and Singapore guidelines. For moderate risk and high risk patients, recommendations are similar in both the Singapore guideline and American Cancer Society guideline.
<table>
<thead>
<tr>
<th>Guidelines</th>
<th>Average risk</th>
<th>Moderate risk</th>
<th>High risk</th>
</tr>
</thead>
</table>
| U.S. Preventive Services Task Force (USPSTF)\(^{24}\) | - Start screening at 50 years old.  
- FOBT annually; flexible sigmoidoscopy every 5 years with FOBT every 3 years; colonoscopy every 10 years  
- Stop at 75 years old. | - No recommendation.                                                                 | - No recommendation.                                                                 |
| American Cancer Society (ACS) guidelines\(^{13}\) | - Start at 50 years old.  
- FOBT annually; flexible sigmoidoscopy every 5 years; DCBE every 5 years; CT colonography every 5 years; colonoscopy every 10 years; Faecal DNA but interval uncertain. | - Start at age 40 or 10 years prior to index case in the family, whichever is earlier.  
- Colonoscopy every 5 to 10 years. | - FAP: start at 10-12 years old. Flexible sigmoidoscopy annually; genetic testing.  
- HNPCC: start at 20-25 years old or 10 years before the youngest case in the immediate family. Colonoscopy 1-2 yearly; genetic testing.  
- IBD: start 8 years after onset of pan-colitis, 12-15 years after onset of left-sided colitis. Colonoscopy 1-2 yearly with biopsies. |
| Asia Pacific consensus recommendations for colorectal cancer screening\(^{10}\) | - Start at 50 years old.  
- FOBT 1-2 yearly; Flexible sigmoidoscopy every 5 years; colonoscopy every 10 years. | - No recommendation.                                                                 | - No recommendation.                                                                 |
| Singapore guideline\(^{25}\)      | - Start screening at 50 years old.  
- FOBT annually; colonoscopy every 10 years; CT colonography every 5 years. | - Start at age 40 or 10 years prior to index case in the family, whichever is earlier.  
- Colonoscopy every 5 to 10 years. | - FAP: start at 10-12 years old (from puberty). Flexible or colonoscopy annually; genetic testing.  
- HNPCC: start at 20-25 years old. Colonoscopy 1-2 yearly; genetic testing.  
- IBD: left-sided colitis. 15\(^{th}\) year of diagnosis onwards. Colonoscopy 1-2 yearly.  
Pan-colitis. 8\(^{th}\) year of diagnosis onwards. Colonoscopy 1-2 yearly. |
| Malaysia guideline\(^{20}\)       | - FOBT yearly.                                                               | - Unclear.                                                                     | - Unclear.                                                                |
2.5 Colorectal cancer screening modalities

There are multiple options of screening modalities for colorectal cancer screening. The main modalities that are currently recommended by guidelines are FOBT (guaiac or immunochemical type), flexible sigmoidoscopy and colonoscopy (Table 3).

Table 3. Sensitivity and specificity of different colorectal cancer screening modalities\(^\text{26}\)

<table>
<thead>
<tr>
<th>Screening test</th>
<th>Sensitivity for CRC (%)</th>
<th>Sensitivity for advanced adenomas (%)</th>
<th>Specificity for CRC (%)</th>
<th>Specificity for advanced adenomas (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>gFOBT</td>
<td>11–64</td>
<td>11–41</td>
<td>91–98</td>
<td>n.a.</td>
</tr>
<tr>
<td>iFOBT</td>
<td>56–89</td>
<td>27–56</td>
<td>91–97</td>
<td>n.a.</td>
</tr>
<tr>
<td>Flexible sigmoidoscopy</td>
<td>60–70</td>
<td>50–81</td>
<td>60–70</td>
<td>50–80</td>
</tr>
<tr>
<td>Colonoscopy</td>
<td>95</td>
<td>95</td>
<td>95–99</td>
<td>90–95</td>
</tr>
</tbody>
</table>

CRC: colorectal cancer; gFOBT: guaiac faecal occult blood test; iFOBT: immunochemical faecal occult blood test

FOBT has been used as a screening modality since 1977.\(^\text{27}\) Since then, it has frequently been used as one of the modality for colorectal cancer screening. Most of the guidelines recommended FOBT as one of the option for screening.\(^\text{10, 13, 24, 25}\) It is also the first line recommended test for screening in resource-limited countries.\(^\text{10}\) Screening FOBT annually or biennially has been shown to reduce colorectal cancer incidence and mortality.

There are two types of FOBT; guaiac faecal occult blood test (gFOBT) and immunochemical faecal occult blood test (iFOBT). A Cochrane review reported that there is a 25% relative reduction on colorectal cancer mortality using the gFOBT.\(^\text{16}\)

However, gFOBT has its limitations as the patient need to collect two stool samples from each of three consecutive bowel movements at home. Patients also need to avoid nonsteroidal anti-inflammatory drugs (NSAIDs), red meat, vitamin C, poultry,
fish and some raw vegetables before the test as there can be interactions with the test causing false positive or false negative results. The sensitivity and specificity of gFOBT varies with different manufacturer.

The advantages of iFOBT over gFOBT are patients need only to collect one stool sample and there are no dietary restrictions prior to testing. The sensitivity and specificity of iFOBT are similar to gFOBT. However, there are no randomized control trials evaluating iFOBT and cost can be an issue.

Flexible sigmoidoscopy is another screening modality that has been proven to reduce colorectal cancer incidence and mortality. A recently published randomized controlled trial from Norway has shown that flexible sigmoidoscopy reduces colorectal cancer incidence by 20% and mortality by 27%. A Cochrane review reported that there was a reduction of 18% in incidence and 28% in risk of death from colorectal cancer with flexible sigmoidoscopy screening. The review also showed a 15% reduction in mortality compared to screening with FOBT.

The advantages for this modality are that it can be performed by any trained professional (doctors, nurses, medical assistants), bowel preparation is easy and it does not require sedation. Limitations included the limited depth of the scope, it is operator dependent and there is a risk of perforation. Because of the limited depth, detection of any adenomas requires a patient to undergo colonoscopy. The risk of perforation was reported to be fewer than 1 in 20,000 procedures. Therefore, the recommended screening interval is 5 yearly.

Colonoscopy remains the gold standard screening modality for colorectal cancer. Many observational studies have shown that colonoscopy is capable of reducing colorectal cancer incidence and death by 40% – 60%. The National Polyp Study in 1993 reported that the incidence of colorectal cancer was reduced by 76% to 90% after
clearing colonoscopy. Currently, randomized control trials that evaluate colonoscopy in reduction of colorectal cancer mortality are ongoing. A preliminary result from one of the studies showed that the detection rate for colorectal cancer were similar between iFOBT and colonoscopy.29

The advantages of colonoscopy are it allows a detail inspection of the entire colon, biopsy procedure and polypectomy. Most of the screening tests when positive are followed by colonoscopy for a detail evaluation of the colon. However, colonoscopy is not without its limitations. Patients might choose another screening modality because the procedure is quite invasive. Proper bowel preparation is essential for detail evaluation of the colon. The procedure is also operator dependent. Studies have shown that the missing rate of cancer for colonoscopy is about 5%.13 Another limitation is polypectomy has been shown to be ineffective occasionally in eradicating polyps.13 Complications of colonoscopy includes perforation (1 in 1000), post polypectomy bleeding and complications secondary to sedation.13 Therefore, the patient has to be properly counselled about the risk and benefit before proceeding with the procedure. The recommended screening interval for colonoscopy is every 10 years or earlier if polyps are detected.

Other tests used for screening are DCBE, CT colonography and faecal DNA. DCBE used to be a recommended test in the USPSTF guidelines in 2002.30 However, the test is no longer recommended in the 2008 USPSTF guidelines, Asia Pacific consensus recommendations for colorectal cancer screening and Singapore guideline. This is because DCBE has low sensitivity rate.10 There is also lack of published trials and case-control study evaluating this test.10 CT colonography and faecal DNA are newer screening tests. A meta-analysis showed that CT colonography can detect polyp size from 6mm to 9mm with sensitivity of 70% and specificity of 93%. The sensitivity
and specificity increases with the size of the polyp. A recent study published reported that faecal DNA test has a sensitivity of 92.3%, 20% more than iFOBT and specificity of 86.6% compared to 94.9% in iFOBT. Both of these tests are still new but show great prospect in the future for screening.

2.6 Impact of primary care physicians on colorectal cancer screening

Although colorectal cancer screening has been shown to be effective in reducing the incidence and mortality of colorectal cancer, adherence is still low. A study conducted in South Korea revealed that screening rate with recommendation was only 44.7% in 2012. The screening rate in the United States with extensive screening programmes only manage a screening rate of 50%.

One of the important determinants for adherence to screening is the primary care physicians' role in facilitating the recommendation. Studies have shown that physicians that recommend or discuss screening with their patients resulted in a higher rate of compliance and continuity in screening. A local study done showed that 84.6% of participants would undergo screening if advised by health professionals. A review done revealed that patients were 12 times more likely to comply with sigmoidoscopy screening when recommended by a physician. Patients were also 17 times more likely to complete the FOBT test when encouraged by their physician. Having a regular doctor and consistent periodic assessment with a doctor has shown better adherence to colorectal cancer screening. In a study done in Italy, compliance of FOBT with general practitioners was 3.4 times higher compared to compliance with the hospital.
2.6.1 Knowledge on colorectal cancer screening

Primary care physicians play a very important role in giving the right recommendations for colorectal cancer screening. Since most patients will come first to their primary care providers for advice, physicians need to be aware of the latest guidelines to give the right recommendations. A study done in the United States revealed that only 19% of physicians gave guideline consistent recommendations.\(^{36}\) A survey done to assess colorectal cancer screening knowledge on high risk patients among physicians reported that overall knowledge on screening guidelines was low.\(^{37}\) Another study in Italy showed that only one third of the general practitioners made the right screening recommendations.\(^{38}\) Unawareness or lack of knowledge about the latest clinical evidence and guidelines was cited as a reason for the lack of knowledge about screening.\(^{36-38}\) Other factors that positively contribute to knowledge about screening are higher level of training, younger physicians, seeing fewer patients, recommending more than one screening modality and priority to patient’s preference for screening.\(^{36,39}\)

2.6.2 Facilitators and barriers to colorectal cancer screening

There are many factors that impact a physician's decision to recommend colorectal cancer screening. The factors according to a theoretical framework by Subramaniam et al are patient adherence, perceived test effectiveness, physicians’ demographic, guidelines awareness, obstacles to screening and training.\(^7\) From their review, factors that increase colorectal cancer screening are younger physicians, physicians that graduated within the last 10 years, physicians who are internists or in family practice, awareness of guidelines, physicians who are trained to perform sigmoidoscopy and good physician-patient relationship while factors that decrease screening are lack of equipment and low reimbursement.\(^7\) Age, gender, perceived
effectiveness of tests, costs, lack of insurance, lack of time and lack of efficacy data of test were not significant predictors for recommendation of screening. It is important to note that knowledge on screening may not necessarily increase the rate of screening. A study done in Hawaii showed that over 80% of physicians were familiar with the screening guidelines. However, only 39% of physicians responded that they always follow the guidelines. Another study done in Italy reported that knowledge on screening practice did not show a higher compliance in screening with FOBT. It seems that not the knowledge but the willingness of the physician to be involved in screening is the determinant factor for success.

2.7 Justification of research

Colorectal cancer screening has been proven to reduce the incidence and mortality rate of colorectal cancer screening. However, in Malaysia, there are no proper guidelines or programmes on colorectal cancer screening. Currently, only a pilot project on screening using iFOBT has been started since January this year involving eight government clinics in Kuala Lumpur. Most of the time, colorectal cancer screening is done as an opportunistic screening. Therefore, there is a need to know the knowledge and practice of colorectal cancer screening among primary care physicians to identify the gaps of knowledge and current practice in the local context. So far, only one other local study has been done to explore the practice and barriers of using FOBT among primary care physicians in government clinics. Hopefully, the outcome of this study can contribute to the body of knowledge regarding colorectal cancer screening in our population.
CHAPTER 3: OBJECTIVES

3.1 General Objectives

To assess the knowledge and practice of colorectal cancer screening among primary care physicians in the public primary care setting in Kuala Lumpur.

3.2 Specific Objectives

3.2.1 To assess the knowledge level on risk stratification of colorectal cancer screening among primary care physicians

3.2.2 To assess the knowledge on colorectal screening modalities among primary care physicians and its associations

3.2.3 To determine the proportion of primary care physicians practicing colorectal cancer screening

3.2.4 To determine the facilitators and barriers that influence primary care physicians in their practice of colorectal cancer screening

3.2.5 To determine the factors that influences the primary care physicians to practice colorectal cancer screening