

Awareness of Colorectal Cancer among the Urban Population in the Klang Valley

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Abstract

Background: Colorectal cancer (CRC) is the second most common cancer in Malaysia. Awareness of risk factors, symptoms and warning signs of CRC will help in early detection. This paper presents the level of CRC awareness among the urban population in Malaysia.

Method: A cross-sectional study was conducted from November 2015 till December 2016 at three government clinics in the Klang Valley. The validated Bowel Cancer Awareness Measure questionnaire in both English and Malay was used. The mean knowledge scores for the warning signs and risk factors of CRC in different socio-demographic groups were compared using ANOVA in SPSS version 23. Statistical significance was set at $p < 0.05$ and a 95% confidence level.

Results: Of the 426 respondents, 29.1% were unable to recall the warning signs and symptoms of CRC. Average recall was less than two warning signs and symptoms (mean 1.62, SD 1.33). The mean total knowledge score for CRC was 9.91 (SD 4.78), with a mean knowledge scores for warning signs and risk factors at 5.27 (SD 2.74) and 4.64 (SD 2.78), respectively. Respondents with a higher level of education were found to have higher level of knowledge regarding the warning signs of CRC. There was a significant positive association between knowledge score for warning signs and level of confidence in detecting warning signs. Regarding the total knowledge score for CRC, 3.3% of respondents scored zero. For warning signs and risk factors, 8.2% and 8.5% of respondents had zero knowledge scores, respectively.

Conclusions: Generally, awareness of CRC is poor among the urban population of Klang Valley. Greater education and more confidence in detecting warning signs are significantly associated with better knowledge of warning signs. CRC awareness programs should be increased to improve awareness.

Introduction

Colorectal cancer (CRC) has become the third most common cancer globally¹ and is considered a leading cause of death, particularly in Western countries.² Colorectal cancer is the third most common cancer in men (746,000 cases, 10.0% of total) and the second most common cancer in women (614,000 cases, 9.2%) worldwide. Almost 55% of cases occur in the more developed regions.¹

The 2007 Malaysian National Cancer Registry Report found CRC to be the second most common cancer in Malaysia.³ In particular, it is also the second most common cancer in males and third most common in females.⁴ From 2008 to 2013, the overall incidence rate for colorectal cancer was 21.3 cases per 100,000 individuals in Malaysia. The age-adjusted incidence rate of colorectal cancer was 1.33 higher among males than females. The incidence rate was highest among the Chinese (27.4 cases per 100,000 individuals).⁴ The estimated 5-year prevalence rate in Malaysia for colorectal cancer was 12.2%

for both sexes in 2012.¹ Overall mortality rate from CRC was 9.8 cases per 100,000 individuals between 2008 to 2013.⁴ cancers detected at the localized stage to 10% for people diagnosed with distant metastases.⁵ In general, the earlier CRC is detected, the higher the chance of survival. Hence, awareness of risk factors, symptoms and warning signs will help in early detection of CRC.

Persistent changes in normal bowel habits, bleeding from the back passage, a lump in the abdomen and unexplained tiredness are some examples of detectable symptoms of CRC, whereas modifiable risk factors include red and processed meat consumption, obesity and alcohol consumption.⁶ In a United Kingdom survey of adults, 24% could not correctly name any warning signs, and 58% were unable to correctly recall any risk factors.⁷

A study among the rural population in Malaysia also demonstrate low levels of awareness of warning signs and risk factors.⁸ This study aims to determine whether the urban Malaysian population will exhibit similar findings to the rural population.

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Research Objectives

The general objective of this study is to determine the level of CRC knowledge among the adult urban population in the Klang Valley in Malaysia. Specific objectives aim to determine the:

- awareness of warning signs and symptoms of CRC.
- knowledge of risk factors associated with CRC.
- confidence in noticing warning signs.
- association between socio-demographic factors and the knowledge score for warning signs and risk factors.
- association of previous experience of cancer with the knowledge score on warning signs and risk factors.

Method*Study setting:*

A cross-sectional study was conducted from November 2015 till December 2016. Approval was obtained from the National Medical Research Register [Reg Number NMRR-16-96-29036(IIR)] and the Medical Register and Ethics Committee.

Sample size:

Based on a rate of 30% of rural respondents with good knowledge⁸ and a 95% confidence level, the sample size required is 323 using the OpenEpi calculator. Considering non-response rate of about 20%, 420 patients should be targeted.

Data was collected over a 3-week period from consenting patients aged 18 years and above seeking health care at three government clinics in the Klang Valley (Klinik Kesihatan Putrajaya Presint 9, Klinik Kesihatan Pandamaran, Klang and Klinik Kesihatan Taman Medan, Petaling Jaya). Foreigners and patients with cognitive impairments were excluded. The clinics were purposively chosen with consent from the health authorities. The clinics have an average load of 60 patients per doctor per day. Systematic random sampling with a ratio of 1:10 was used. The authors (1 to 5) were each tasked with recruiting six respondents per day for 15 working days.

Study tool:

Awareness of CRC was measured using a questionnaire, the Bowel Cancer Awareness Measure (Bowel/Colorectal CAM), which was

designed to assess awareness of cancer reliably among the general population. This validated questionnaire was developed by University College London and Cancer Research UK based on a generic CAM developed by Cancer Research UK, University College London, Kings College London and Oxford University in 2007-08. The Bowel/Colorectal CAM meets accepted psychometric criteria for reliability (Cronbach's alpha = 0.84; $r = 0.7$) and construct validity [Bowel cancer experts achieved higher scores than equally educated controls (54.7 [4.3] vs. 42.9 [5.7]; $P < 0.001$)].¹⁰

Out of the 25 questions on bowel cancer awareness in the original Bowel/Colorectal CAM, one question was excluded since it was not suitable in the Malaysian context. Key sections of the questionnaire include the demographic profiles of patients, warning signs and risk factors of colon cancer, confidence in identifying warning signs, help-seeking behavior and previous experience of cancer

A pilot study on 30 participants was conducted before the survey took place to evaluate whether the questions were clear and easily understood. No problems were encountered; hence, the questionnaire was not modified.

Knowledge of symptoms and warning signs of colorectal cancer:

There are one open-ended (unprompted) and nine close-ended (prompted) questions on symptoms and warning signs of CRC. The unprompted question measures the number of CRC warning signs a respondent can recall unaided. Prompted questions assess the knowledge level of respondents in detecting warning signs. Each appropriate 'YES' answer is assigned a point.¹⁰

Knowledge of risk factors of colorectal cancer:

There are one open-ended and 10 close-ended questions on knowledge of risk factors of bowel cancer. The "open-ended" question measures the number of CRC risk factors a respondent can recall unaided. Close-ended questions assess the knowledge level of respondents in identifying CRC risk factors, with each correct answer scoring one point.

Other Bowel Cancer Awareness Measure (CAM) questions addressed the self-rated confidence level in noticing bowel cancer symptoms and opinions on age-related bowel cancer incidence.

The time interval to seek help if symptoms of bowel cancer are noticed was also addressed in the questionnaire. A delay in this time interval is defined as a delay in seeking treatment of more than two weeks.⁹ Data were also collected on patients' socio-demographic statuses and experiences with cancer.

Description of variables:

The total knowledge score for warning signs of bowel cancer ranges from 0 to 9, while the total knowledge score for risk factors ranges from 0 to 10. Other variables are socio-demographic characteristics, including age, gender, ethnicity, marital status, education level, work status and monthly income.

Process of data collection:

Data was collected through a face-to-face interview using the English and Malay Bowel CAM questionnaire. All interviewing researchers (authors 1-5) have been trained and are well versed in Malay and English. Patients were identified at the registration counter. The first patient was determined randomly. Subsequently, every 10th patient was triaged to the researcher. Researchers approached the patients with the participant information sheet and questionnaire.

The objectives and purpose of the study were explained and written informed consent obtained. Confidentiality and rights to withdraw were ensured. The first and second author checked the results for interviewer bias.

Statistical analysis:

The data were entered and analyzed using SPSS Version 23. For a preliminary analysis, a normality test and descriptive analysis were done. The data was checked for errors and cleaned. The association between knowledge score for warning signs and risk factors of CRC were analyzed against the independent variables using ANOVA and presented using means with 95% confidence intervals. Statistical significance was set at $p < 0.05$. The Pearson correlation coefficient was also used to detect the correlation between the knowledge score of warning signs and level of confidence in detecting a warning sign.

Results

Four-hundred eighty respondents were approached for the study. A total of 426 respondents agreed to participate in the study and complete the questionnaire. The response rate was 88.8%. The socio-demographic characteristics are displayed in **Table 1**.

Table 1: Socio-demographic characteristics of the participants (n= 426)

Socio-demographic characteristics	Frequency	Mean (\pm Std deviation or percentage)
Age in years		37.04 (\pm 12.55)
<i>Gender</i>		
Male	164	38.5%
Female	262	61.5%
<i>Ethnicity</i>		
Malay	255	59.9%
Chinese	59	13.8%
Indian	94	22.1%
Other	18	4.2%
<i>Marital status</i>		
Single	130	30.5%
Married	278	65.3%
Widowed	11	2.6%
Divorced	5	1.2%
Prefer not to say	2	0.5%
<i>Education status</i>		
No education/Primary/Secondary	227	53.3%
Tertiary	198	46.5%
Prefer not to say	1	0.2%
<i>Work status</i>		
Employed full time	319	74.9%
Employed part time and unemployed	106	24.9%
Prefer not to say	1	0.2%
<i>Monthly income</i>		
< RM 5000	306	71.8%
> RM 5000	88	20.7%
Prefer not to say	32	7.5%

Knowledge of warning signs and symptoms:

Of the 426 respondents, 29.1% were unable to recall the warning signs and symptoms of CRC. Average recall was less than two warning signs and symptoms (mean 1.62, SD 1.33). “Abdominal pain” was the most commonly recalled warning symptom (38.5%), followed closely by “blood in stools” (33.3%) and “change in bowel habits” (32.9%). Warning signs and symptoms that were least recalled were “back passage pain” (3.3%), “abdominal lump” (2.3%) and “feeling of incomplete emptiness of bowel” (2.1%). The common incorrect answers provided for the unprompted warning signs and symptoms were loss of appetite (22.1%), feeling bloated (6.6%) and vomiting (6.4%).

Compared with unprompted awareness, prompted awareness showed a similar trend, whereby the most prompted warning sign and symptom was “abdominal pain” (68.8%), followed by “blood in stool” (67.6%) and “lump in abdomen” (67.4%). The least prompted warning signs and symptoms did not follow a similar trend. They were: “tiredness/anemia” (49.1%), “feeling of incomplete emptiness of bowel” (43.4%) and “back passage pain” (41.5%).

In summary, the percentages for prompted awareness were higher compared to those for unprompted awareness for all warning signs and symptoms.

Table 2: Awareness of warning signs and symptoms of CRC (n= 426)

Signs and symptoms	Unprompted (%)	Prompted (%)
Abdominal pain	38.5 (n=164)	68.8 (n=293)
Bleeding from back passage	11.5 (n=49)	62.7 (n=267)
Change in bowel habits	32.9 (n=140)	61.7 (n=263)
Feeling of incomplete emptiness of bowel	2.1 (n=9)	43.4 (n=185)
Tiredness/anemia	14.6 (n=62)	49.1 (n=209)
Unexplained weight loss	23.7 (n=101)	64.8 (n=276)
Lump in abdomen	2.3 (n=10)	67.4 (n=287)
Back passage pain	3.3 (n=14)	41.5 (n=177)
Blood in stools	33.3 (n=142)	67.6 (n=288)

Knowledge of risk factors:

Unprompted awareness of risk factors associated with CRC was very poor, as 66.2% were unable to recall any risk factors associated with CRC, with an average recall of less than 1 risk factor (mean 0.49, SD 0.82). Among unprompted risk factors, “alcohol consumption” was the most quoted by participants (10.8%), followed by “family history of having bowel cancer” (9.2%) and “low physical activity” (8.7%). Risk factors that participants could least recall without prompting were “having other bowel disease” (1.9%), “older age” (1.4%) and “having diabetes” (0.9%). The common incorrect answers provided for unprompted risk factors were “poor diet”

(62.4%), “poor lifestyle” (16.4%) and “smoking” (12.2%). Three respondents even mentioned that bad luck and God’s will were risk factors of CRC.

When prompted, the percentage of awareness of risk factors increased sharply, as evidenced by “having other bowel disease” (62%), “low fiber diet” (51.9%) and “overweight/obese” (50.7%). The risk factor that participants could least recall despite prompting was “having diabetes” (32.4%).

Overall, the prompted awareness for risk factors of CRC is higher than the unprompted awareness as shown in Table 3.

Table 3: Awareness of risk factors associated with CRC (n= 426)

Risk factors	Unprompted (%)	Prompted (%)
Alcohol consumption	10.8 (n=46)	47.4 (n=202)
Low intake of fruits/vegetables	3.1 (n=13)	44.8 (n=191)
High intake of red and processed meat	4.7 (n=20)	45.5 (n=194)
Low fiber diet	3.8 (n=16)	51.9 (n=221)
Overweight/Obese	4.9 (n=21)	50.7 (n=216)
Older age	1.4 (n=6)	39.9 (n=170)
Family history of having bowel cancer	9.2 (n=39)	47.9 (n=204)
Low physical activity	8.7 (n=37)	41.8 (n=178)
Having other bowel disease	1.9 (n=8)	62 (n=264)
Having diabetes	0.9 (n=4)	32.4 (n=138)

Knowledge of age-related incidence of colorectal cancer:

Respondents were asked, “In the next year, who is most likely to develop bowel cancer?” A full 59.2% (n=252) said that CRC is not related to age as shown in Table IV. Only 10.3% (n= 44) provided the correct answer, which is “a person who is 60 years is most likely to develop bowel cancer in the next year.”

Table 4: Awareness of risk factors associated with CRC (n= 426)

Age	Percentage (%)
20-year-old	7.5 (n=32)
40-year-old	22.8 (n=97)
60-year-old	10.3 (n=44)
Not related to age	59.2 (n=252)
No answer	0.2 (n=1)

Knowledge score of colorectal cancer:

Close-ended questions on the warning signs and symptoms and risk factors were used to acquire the knowledge score. In the results, 8.2% of the respondents scored zero knowledge for warning signs and symptoms, and 8.5% scored zero knowledge score for risk factors. The mean total knowledge score for CRC was 9.91 (SD 4.78), with the mean knowledge scores for warning signs and risk factors at 5.27 (SD 2.74) and 4.64 (SD 2.78), respectively. Fourteen respondents (3.3%) had a total zero knowledge score for CRC.

Confidence in noticing a warning sign:

181 respondents (42.5%) were not very confident in identifying warning sign of CRC. However, 170 (39.9%) were fairly confident in identifying warning signs, while 10.6% were not at all confident and 6.8% were very confident in noticing the warning signs. There was a significant positive correlation (Pearson correlation coefficient = 0.343, $p < 0.01$) between the knowledge score for warning signs and the level of confidence in detecting a warning sign.

When asked “If you had a symptom that you thought might be a sign of bowel cancer, how soon would you contact your doctor to make an appointment to discuss it?”, 75.1% would seek help within one week. The mean duration for seeking help after noticing possible signs of bowel cancer was 1.23 (± 0.18) weeks. For seeking help, 24.4% of Malays, 28.8% Chinese, 13.0% Indians and 29.4% of other ethnicities anticipated a delay. However, ethnicity is not a significant factor for anticipated delay in help-seeking behavior (Pearson $\chi^2 = 6.982$, $p = 0.072$).

Factors associated with knowledge score for warning signs and risk factors:

Age, gender, ethnicity, marital status, income level and employment status were not significantly associated with the awareness of CRC as shown in Table V. Respondents who received a tertiary education had a higher knowledge score for warning signs and symptoms of CRC compared to the other groups. Based on the regression analysis, education level was still significant for warning signs and symptoms of CRC was still significant after adjusted for age, gender, ethnicity, marital status, income level

and employment status (p value = 0.006; CI = 0.267 – 1.596; R² = 0.012). Education level was not significantly associated with the knowledge score for risk factors.

Table 5: Socio-demographic variation in knowledge scores for warning signs and risk factors of CRC (n= 426)

Variable	Warning signs		Risk factors	
	Mean (95% confidence interval)	ANOVA	Mean (95% confidence interval)	ANOVA
<i>Age</i>				
18-19 (n= 6)	4.0 (1.35-6.65)	F (0.312)	3.0 (-0.11-6.11)	F (1.24)
20-29 (n= 124)	5.21 (4.73-5.69)	p=0.906	4.27 (3.80-4.73)	p=0.289
30-39 (n= 164)	5.28 (4.87-5.70)		4.87 (4.42-5.31)	
40-49 (n= 51)	5.43 (4.71-6.15)		4.76 (4.04-5.50)	
50-59 (n= 50)	5.34 (4.50-6.18)		4.96 (4.13-5.80)	
>60 (n= 31)	5.32 (4.15-6.49)		4.58 (3.51-5.65)	
<i>Gender</i>				
Male (n= 164)	5.10 (4.67-5.53)	F (1.06)	4.67 (4.03-4.91)	F (1.04)
Female (n= 262)	5.38 (5.05-5.71)	p=0.305	4.75 (4.42-5.09)	p=0.309
<i>Ethnicity</i>				
Malay (n=255)	5.35(5.02-5.68)	F (0.26)	4.62 (4.28-4.95)	F (0.11)
Chinese (n=59)	5.07(4.28-5.86)	p=0.853	4.54 (3.75-5.33)	p=0.952
Indian (n=94)	5.15(4.59-5.71)		4.73 (4.16-5.31)	
Other (n=18)	5.44(4.02-6.87)		4.89(3.41-6.36)	
<i>Marital status</i>				
Single (n= 130)	4.97 (4.52-5.41)	F (1.17)	4.10 (3.64-4.56)	F (2.56)
Married (n=278)	5.44 (5.12-5.77)	p=0.320	4.91 (4.57-5.24)	p=0.055
Widowed (n=11)	5.36 (2.83-7.90)		4.82 (2.76-6.87)	
Divorced (n=5)	4.20 (-0.22-8.62)		4.20 (0.54-7.86)	
Missing (n=2)	4.97 (4.52-5.41)		4.10 (3.64-4.56)	
<i>Education</i>				
No education/primary/secondary (n=227)	4.95 (4.58-5.32)	F (6.395)	4.84 (3.94-5.75)	F (0.15)
Tertiary (n=198)	5.62 (5.26-5.98)	p= 0.012*	4.60 (4.18-5.00)	p=0.860
Missing (n=1)				
<i>Income level</i>				
< RM 5000 (n=306)	5.26 (5.00-5.57)	F (0.23)	4.53 (4.21-4.84)	F (1.93)
>RM 5000 (n=88)	5.42 (4.87-5.97)	p=0.63	4.99 (4.42-5.55)	p=0.17
Missing (n=32)				
<i>Employment status</i>				
Full-time job (n=319)	5.37 (5.08-5.66)	F (1.84)	4.75 (4.45-5.05)	F (1.73)
Part-time job/Unemployed (n=106)	4.95 (4.38-5.53)	p=0.175	4.34 (3.78-4.90)	p=0.19
Missing (n=1)				

Footnote: *p<0.05

According to Table VI, respondents with previous experience of cancer in self/spouse/close family, other family members or friends were not significantly associated with the awareness of CRC.

Table 6: Association of previous experience of cancer and knowledge score for warning signs and risk factors (n=426)

Variable	Warning signs		Risk factors	
	Mean (95% confidence interval)	ANOVA	Mean (95% confidence interval)	ANOVA
<i>Cancer in self/spouse/close family member</i>				
Yes (n=86)	5.53 (4.96-6.11)	F (1.03)	4.91 (4.38-5.43)	F (0.64)
No (n=315)	5.19 (4.89-5.50)	p=0.31	4.63 (4.32-4.95)	p=0.43
<i>Cancer in other family member</i>				
Yes (n=98)	5.35 (4.85-5.84)	F (0.04)	4.83 (4.29-5.36)	F (0.18)
No (n=294)	5.28 (4.96-5.61)	p=0.84	4.69 (4.36-5.01)	p=0.67
<i>Cancer in friends</i>				
Yes (n=90)	5.64 (5.14-6.15)	F (0.97)	4.89 (4.33-5.45)	F (0.01)
No (n=257)	5.31 (4.95-5.66)	p=0.33	4.85 (4.49-5.21)	p=0.91

Discussion

Primary care physicians need be informed about the level of public awareness of CRC, as they are the front liners in early detection and prevention of CRC. Having this knowledge can help them target high-risk groups for education and screening for early diagnosis and improvement in survival for CRC.

From this study, the majority of the urban population appears to have some knowledge of the signs and symptoms of CRC, whereby 70.9% of the respondents could recall at least one or more correct warning signs and symptoms in the unprompted item (open-ended question). In contrast, a study on a rural Malaysian population showed poor knowledge, as more than 70% of participants could not recall any signs unprompted.⁸ CRC symptoms are diverse and non-specific.^{11,12} A study on CRC in a tertiary referral center demonstrated that anemia and weight loss were the two most common presentation among CRC patients in Kuala Lumpur (KL).¹³ However, only 14.6% and 23.7% of respondents could relate tiredness/anemia and unexplained weight loss, respectively, to CRC in our unprompted question. With prompting, those figures rose to 49.1% and 64.8%, respectively.

Based on the KL tertiary referral center study,¹³ the third most common symptom in CRC patients was “abdominal pain.” This finding corresponds to our study, which showed that

“abdominal pain” was the most common warning sign and symptom to be recalled in the unprompted question. The same result held in the prompted question, whereby “abdominal pain” was the most agreed upon warning sign and symptom of CRC. It is possible that the urban population perceived abdominal pain to be related to CRC due to anatomic location. The three least recalled answers in the unprompted question were “feelings of incomplete emptiness of bowel” (2.1%), “lump in the abdomen” (2.3%) and “back passage pain” (3.3%). Earlier studies have demonstrated that even when patients have rectal bleeding, due to poor symptom recognition, they delayed seeking medical treatment.¹⁴ In the same study, evidence suggested that if delay is to be reduced, what is important is not merely patients’ awareness of symptoms but rather their recognition and understanding of the potential seriousness of those symptoms.

From this study, it was noted that the mean duration for seeking help after noticing possible signs of bowel cancer was 1.23 (± 0.18) weeks. This is within the acceptable range, as delay is registered when a patient seeks treatment more than two weeks after noticing a warning sign.⁹ A full 75.1% of respondents would seek help within one week, which is slightly lower than the 87.6% of respondents in the Malaysian rural setting study who would do so.⁸ This result contrasts with another study in a multi-ethnic Asian population in 2013, whereby most respondents anticipated a delay in help-seeking

if they noticed a cancer warning sign.¹⁵ A UK study¹⁶ stated that better knowledge of signs and symptoms of cancer may help people recognize possible cancer symptoms and therefore reduce appraisal delay, while more positive attitudes towards help-seeking may reduce behavioral delay. Nevertheless, more research is needed to explore help-seeking behavior with regards to CRC.

Environmental and genetic risk factors can increase the likelihood of developing CRC¹⁷ Our study found that urban Malaysians are generally more aware of the risk factors for CRC compared to local rural populations in Malaysia.^{8,18} The Asia Pacific Working Group in CRC conducted a multinational survey across various Asia Pacific regions and found that the median symptom and risk factor knowledge scores ranged from 0–4 out of 9, with several regions, including Malaysia, scoring zero.¹⁹ The difference between the levels of awareness in the urban and rural populations could be due to the fact that the urban population is better educated and exposed more to health promotion efforts designed to educate the public regarding the risk factors of CRC.

The risk factor that both urban and rural 8 populations were least aware of was “diabetes.” This is consistent with UK findings,¹⁰ which reported that only 25.8% of the participants were aware of diabetes as a risk factor. Many studies have suggested that diabetes mellitus is associated with an increased risk of CRC. A meta-analysis of 14 studies estimated that the risk of colon cancer among diabetics was approximately 38% higher than it was for nondiabetics (relative risk [RR] 1.38, 95% CI 1.26-1.51),²⁰ which should be an indication for healthcare professionals to actively educate the public regarding the risk of CRC in diabetics.

Respondents who have received a tertiary education had higher awareness of the warning signs and symptoms of CRC when compared to those who have received no education or primary or secondary educations. The results are consistent with previous studies conducted in Malaysia,^{8,21} whereby those with higher levels of education have higher levels of awareness of CRC. But education level was not significantly associated with the knowledge score for risk factors. Another study from Saudi Arabia²² also showed that the differences in knowledge of CRC are highly influenced by education status. In line with studies from other regions,²³ the most educated population and those in the age group most likely to develop CRC typically knew

more about CRC risks and screening methods. However, specific and important knowledge, such as knowing that polyps and family history of CRC are risk factors and that screening should be initiated at 50 years of age, are lacking. Therefore, education programs should be aimed at all Malaysians, rural and urban, to increase their awareness and knowledge. Other studies also found that barriers to CRC screening were due to lack of knowledge, especially for those in the lower socioeconomic classes and with limited literacy.²⁴

Respondents who had experienced cancer themselves and those with wives, relatives or friends who have had cancer showed no difference in their levels of knowledge of CRC as compared with those without these connections. This result contrasts with that of another study done in the UK,¹⁰ where knowing someone with CRC resulted in a higher awareness of CRC symptoms, but not risk factors. This difference may be due to respondents choosing not to know about the disease or being in a state of denial. It would be interesting to proceed with another qualitative study to further explore this in our population.

The National Cancer Registry shows that the incidence rate of bowel cancer was highest among the Chinese at 27.4 per 100,000 individuals, followed by Malays at 19.0 and Indians at 17.6.⁴ However, our study showed no significant difference in the awareness of CRC among the Malay, Chinese and Indian populations. This finding contrasts with those of some studies,^{15,18} where, despite the Chinese having the highest incidence of CRC, the Chinese had poorer recognition of CRC symptoms compared to the other ethnicities. The difference in our findings could be the result of the sample size for the Chinese ethnicity being too small in our study.

This study also showed no significant difference in the awareness of CRC based on age, gender, marital status, income level and employment status. However, some studies done in the UK^{7,10} showed that females had a significantly higher awareness of the signs and symptoms of CRC. There was no difference between the male and female genders in terms of awareness of risk factors of CRC. The same studies^{7,10} also noted that the older population was more aware of CRC, as they are at a higher risk and have a greater need to identify the signs and symptoms and risk factors of CRC. The more affluent groups (higher income and work status) also

showed a higher awareness of CRC.¹⁰ This result contrasts with our own, possibly because our study population was from a younger age group with a mean age of 37.04 years old with lower incomes and work statuses.

There are several strengths in our study. This study is the first to be conducted in the urban setting; hence, it provides us with information on the level of awareness of CRC in the urban population and across different age groups, genders, ethnicities and education levels. Such knowledge can help us focus on certain target groups when promoting health campaigns and awareness. By using the Bowel Cancer Awareness Measure (CAM) questionnaire, international comparison of CRC awareness is possible.

The sample was distributed equally among the 6 interviewers working in three different health clinics. Hence, the sample may not represent the actual population accurately. The data for our study was collected from the urban population of the Klang Valley in West Peninsular Malaysia. Hence, this limits our findings only to this region and may not reflect other urban or rural areas. Another limitation was that our respondents were mostly from the younger age group, meaning that the results may not be generalizable to the older population. Further study may be needed which focuses on the older population, as the highest risk of CRC is after 60 years of age.²⁵ Data collection was done via face-to-face interviews, which could have created bias, as interviewers may rephrase their questions or cue patients to expected answers when explaining the questions to patients. The CAM toolkit,

however, has provided comprehensive guidance on gathering consistent and valid data. Language barriers and illiteracy are limitations we faced when explaining the study to patients.

Conclusion

Generally, awareness of CRC is poor among the urban population of Klang Valley. Some patients have zero knowledge of CRC. The level of education and confidence in detecting warning signs are significantly associated with the level of knowledge for warning signs of CRC. CRC awareness programs should be increased to increase awareness in both rural and urban populations, perhaps leading to screening in high-risk patients and earlier diagnoses and better prognoses for CRC.

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Funding and conflict of interest

This study was self-funded, and we declare no conflicts of interest.

How does this paper make a difference to general practice?

- This study acknowledges the need for organizing more health campaigns to educate the population about the warning signs and risk factors of CRC.
- By empowering the population with knowledge of CRC, early screening of high-risk patients can be done, leading to better prognoses for the disease.
- The level of confidence of the population in seeking earlier treatment could be increased with continuous health education.
- This study also helps identify specific socio-demographic factors, such as individuals with no education or a primary education, to be targeted during consultations to increase awareness of CRC further.
- The study identified the least-known risk factors of CRC, which were older age and diabetes mellitus. These factors could be emphasized during health campaigns.

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