

## RESEARCH ARTICLE

# Knowledge and awareness of colorectal cancer (CRC) among nursing students in Puncak Alam

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## Abstract:

Colorectal cancer (CRC) is the second leading cancer in Malaysia. Lack of knowledge and awareness of CRC causing the burden to increase over time. A cross-sectional study was conducted to determine the level of knowledge and awareness of CRC and its relationship with sociodemographic data among nursing students at UiTM Puncak Alam. Total 136 nursing students were selected. Adapted questionnaire from previous studies was distributed to students. The Statistical Package for Social Sciences (SPSS) version 25 was used to analyze the data which the frequency and percentage for the level of knowledge and awareness of CRC while Chi-square and Fisher's Exact test for the relationship respectively. Overall, nursing students at Puncak Alam has good knowledge and awareness of CRC. There is a significant relationship between the levels of knowledge of CRC with age ( $p=0.007$ ) and year of education ( $p<0.001$ ) but conversely with awareness. The knowledge of screening types and age to start the screening of CRC were also not up to mark as this may be due to the information related to CRC screening guidelines that have not yet been made public. Strategies on increasing knowledge about CRC's screening should be implemented and research in multi-racial nursing students recommended.

**Keywords:** Awareness, colorectal cancer, demographic data, knowledge, students

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## 1. INTRODUCTION

Colorectal cancer (CRC) is the third most common type of cancer (1.80 million cases) after lung and breast cancer. It also second in place, causing the most common death related to cancer which 862 000 deaths in 2018 (World Health Organization, 2018). Asian countries such as Japan and South Korea also recently statistically increase CRC cases, thus giving predictions that CRC will become the primary cause of death among the Asian population. In 2012, CRC was considered the third leading cancer but becoming the second most common cancer (6137 cases out of 43 837 new cancer cases) in Malaysia (Globocan, 2018). Statistics also revealed that the mortality rate is 21.32 cases over 100 000 population in Malaysia from 2008 to 2013 (Abu Hassan et al., 2016). Besides, a report from MNCR (2012 – 2016) by Azizah et al. (2019), most cases are detected at a late stage (stage III and IV).

Low public awareness, lack of availability of CRC tests in primary health care institutions and poor understanding of the significance of CRC screening may contribute to the increase of cases in Malaysia (Norwati et al., 2014). Furthermore, low public awareness among Malaysian proved when a study conducted in both rural and urban areas, especially in Klang Valley, generally shows low levels of awareness of CRC (Sindhu et al., 2019). In nursing education, it is crucial to

assess the nursing student's knowledge and awareness of CRC during their professional training because they are the future health professionals. In addition, based on some studies conducted before, it shown that nursing education has influenced nursing's awareness toward CRC.

However, study on knowledge and awareness of CRC among nursing students in higher institutions that offered nursing courses in Malaysia is still not generally conducted including UiTM although it is utmost importance because such knowledge will help to decrease the prevalence and incidence of the modifiable risk factors related to CRC (Rocke, 2019). Thus, the researchers choose to fill the gaps by conducting this study at UiTM Puncak Alam.

## 2 MATERIALS AND METHODS

### 2.1 Study design

This study is a quantitative cross-sectional study conducted at UiTM Puncak Alam and ethical approval was obtained from UiTM Research Committee (REC02/21) (UG/MR/90). Total of 136 nursing students selected by using non-probability sampling method.

### 2.2 Questionnaire

A set of questionnaires was used for this study, which was adapted from Zainuddin and Shamri, (2018) and Mohd Azri

Mohd Suan et al. (2015). To generate face validity, a pilot study was conducted among 30 students at the same population. The Cronbach alpha value was reliable for both variables in which, for knowledge of CRC ( $\alpha = 0.651$ ) while awareness of CRC ( $\alpha = 0.608$ ) respectively.

The questionnaire consisted of part A, part B and part C. Part A section consists of sociodemographic data which are age, gender, and year of education. Section B consists of 24 questionnaires focused on assessing the student's level of knowledge of CRC which include questions on signs and symptoms, risk factors, risk age and available screening options. Section C contains 18 questions related to awareness of CRC including complaints, risk factors and detection.

Each correct answer carries one mark, while a false or do not answer carries a zero mark for both questionnaires. The scoring of knowledge was adapted from Zainuddin and Shamri (2018) which categorized into three categories: poor (1 – 8 marks), moderate (9 – 16 marks), and good (17 – 24 marks). Meanwhile, the scoring for section C was referred to a study by Bidouei et al. (2014). Thus, the total score of awareness was categorized into three categories: poor (1 – 6 marks), moderate (7 – 12 marks), and good (13 – 18).

**2.3 Statistical analysis**

The IBM Statistical Package for Social Sciences (SPSS) version 25 was used. The frequency and percentage were used to determine nursing students' level of knowledge and awareness of CRC. Meanwhile, Chi square and Fisher's Exact Test were used to analyse the relationship between the levels of knowledge and awareness of CRC with the sociodemographic data.

**3. RESULTS AND DISCUSSION**

**3.1 Sociodemographic characteristics**

A total number of 136 respondents had completed and returned the questionnaire. The frequency of gender, age and year of education were shown at table 1.

Table 1 Distribution of sociodemographic data (n=136)

| Characteristics          | Frequency (n) | Percentage (%) |
|--------------------------|---------------|----------------|
| <b>Gender</b>            |               |                |
| Male                     | 23            | 16.9           |
| Female                   | 113           | 83.1           |
| <b>Age</b>               |               |                |
| <21                      | 83            | 61.0           |
| 22-23                    | 51            | 37.5           |
| >24                      | 2             | 1.5            |
| <b>Year of Education</b> |               |                |
| Year 1                   | 45            | 33.1           |
| Year 2                   | 45            | 33.1           |
| Year 3                   | 46            | 33.8           |

**3.2 The levels of knowledge of CRC**

Most of the nursing students (94.1%) have heard about CRC. Internet (88.2%) and educational courses (73.5%) were

the main sources of information. It was found out that sixty-seven respondents (49.3%) had a good level of knowledge followed by sixty-six respondents with a moderate level of knowledge of CRC (48.5%). Lastly, only a few of the respondents have poor knowledge regarding CRC (2.2%).

Of the participants, 97.1% know that CRC is a type of large intestine cancer. Besides, 66% (n=91) agree it is a preventable disease, and 58.1% acknowledge that CRC is one of the leading causes of death in Malaysia.

Meanwhile, for the risk factors of CRC, the percentage of answering true for obesity, lack of physical activities, alcohol consumption, cigarette smoking, low intake of whole-grain fibre, fruits and vegetables, low intake of calcium, high consumption of processed meat, and personal or familial history of CRC are 68.4%, 74.3%, 84.6%, 77.2%, 77.9%, 21.3%, 68.4% and 85.6% respectively.

As for the signs and symptoms of CRC, most of the respondents (97.1%) agree that change in bowel habits, blood in the stool (95.6%) and abdominal pain (89.7%) are the warning signs of CRC. Besides, 105 respondents agree that unexplained weight loss is also one of CRC warning signs. As for weakness and malaise, it is agreed by 73% (n=100) participants.

Next, only 61% of participants answer that a 60-year-old is the one who is likely to develop CRC. On the other hand, only thirty-three participants agree that a 20-year-old (24.4%) and a 40-year-old (15.4%) are not at risk to develop CRC. Meanwhile, 59.6% of participants say that CRC is unrelated to age.

Besides, the percentage for screening test such colonoscopy, flexible sigmoidoscopy, Fecal Occult Blood Test (FOBT), and Double Contrast Barium Enema (DCBE) are 95.6%, 61.8%, 86.0%, and 51.5% respectively.

Finally, among participants who choose “true” as an answer for each screening test, 18 participants answered “every 10 years, age 50” for colonoscopy, thirty-three participants answered “every 5 years, age 50” for flexible sigmoidoscopy, thirty-four respondents choose “every year, age 50” for FOBT and twenty-five respondents choose “every 5 years, age 50” for DCBE.

**3.3 The levels of awareness of CRC**

Total of 130 (95.6%) of the nursing students were found to have a good while less than one-quarter of nursing students (4.4%) have moderate levels of awareness of CRC respectively. Lastly, there are no respondents who have a poor level of awareness of CRC.

Total of 118 (86.8%) respondents were aware that bowel cancer is among the top three cancers in Malaysia. Besides, 136 (100%) nursing students noticed change in bowel habit as the complaints of CRC. The common risk factors of CRC,

such as a family history of bowel cancer and obesity, were cited by more than three-quarters with a total number of 124 (91.2%) and 110 (80.9%) respondents respectively. For risk factors, inflammatory bowel disease was aware by 129 (94.9%) nursing students while only 77% recognized age as a risk factor of CRC.

Next, 125 (91.9%) of respondents are aware that the CRC usually starts from polyps in the colon or rectum, and more than half quarters recognize that it often starts without any symptoms shown by the patients. Among those 131 (96.3%) respondents believe that screening can find cancer early.

Lastly, majority of the respondents are aware that early detection can prevent CRC and can potentially lead to complete cure of the disease while late detection carries the poorest survival rate among the patients.

Table 2. The levels of knowledge of CRC (n=136)

| Score (%)            | Level of knowledge | Frequency (n) | Percentage (%) |
|----------------------|--------------------|---------------|----------------|
| 1 – 8 (4% - 33%)     | Poor               | 3             | 2.2            |
| 9 – 16 (38% - 67%)   | Moderate           | 66            | 48.5           |
| 17 – 24 (71% - 100%) | Good               | 67            | 49.3           |

Table 3. The levels of awareness of CRC (n=136)

| Score (%)        | Level of awareness | Frequency (n) | Percentage (%) |
|------------------|--------------------|---------------|----------------|
| 1-6 (6%-33%)     | Poor               | 0             | 0              |
| 7-12 (39%-67%)   | Moderate           | 6             | 4.4            |
| 13-18 (72%-100%) | Good               | 130           | 95.6           |

### 3.4 The relationship between levels of knowledge of CRC with sociodemographic data

The p-value of gender, age, and year of study is 0.108, 0.007, and 0.000, respectively. Among all respondents, males have the lowest number of respondents with a good level of knowledge, only ten (43.5%) and have the highest number of respondents with a poor level of knowledge (n=2). Otherwise, eleven male respondents have a moderate level of knowledge regarding CRC. Meanwhile 50.4% female respondents showed good levels of knowledge, followed by 48.7% of female respondents with a moderate level and only one (0.9%) female student have a poor level of knowledge of CRC respectively.

From a sum of 83 respondents aged 21-years-old and below, more than half (57.8%) has a moderate level of knowledge, followed by 38.6% (n=32) of them having a good level of knowledge. In the meantime, eighteen respondents (35.3%) in the group aged 22 to 23 years old have a moderate level of knowledge of CRC. The remaining thirty-three respondents (64.7%) have good knowledge of CRC. As for respondents aged above 24 years old, both have a good level of knowledge (100.0%) regarding CRC. Whereas the number of respondents with poor knowledge about CRC is three students (3.6%), and

all of them are within the age group of 21 years old and below.

Next, for year of study, year three students have the highest number of respondents with a good level of knowledge of CRC (67.4%), followed by year two and year three students, which are twenty-five (55.6%) and eleven (24.4%) respondents respectively. For moderate levels of knowledge to a year of study, year one has the highest number, which is thirty-two students (71.1%), followed by nineteen students from year two (42.2%) and fifteen students (32.6%) from year three. Lastly, poor levels of knowledge are from two students of year one (4.4%) and one student from year two (2.2%).

### 3.5 The relationship between levels of awareness of CRC with sociodemographic data

The p-value for gender, age and year of education are 0.602, 0.506 and 0.699. A total number of 23 (17.45%) male and 106 (93.8%) female nursing students have a good level of awareness of CRC.

Besides, nursing students to the group age indicates 129 (94.9%) have a good level of awareness of CRC. Group age above 24 years with total nursing students of two (100%) followed by age less than 21 years that are 75 (96.2%) and lastly 52 (92.9%) from 22 to 23 years have a good level of awareness. Meanwhile, group age range less than 21 years with a total of three (3.8%) and 22 to 23 years which four (7.1%) have a moderate level of awareness of CRC respectively.

From the year of education, year one results in 42 (93.3%) while year two with 44 (97.85%), and year three 43(93.5%) nursing students have a good level of awareness of CRC.

## 4. DISCUSSION

### 4.1 The levels of knowledge of CRC

Having sufficient knowledge regarding a cancer, is essential for nursing students because they are the future representative of the health sector. Their knowledge can be applied in helping early identification or screening of the disease, prevention and strengthening the public understanding of a disease.

In general, the level of knowledge of CRC among nursing students at UiTM Puncak Alam was good. The result showed that most of the respondents had a good level of knowledge with only less than a quarter fall in the category of poor knowledge. The rest of the respondents had a moderate level of knowledge. This finding was similar to a study conducted in the Caribbean territory (Rocke, 2019). In contrast, the finding showed a bit different from the previous study done among IUM Kuantan undergraduate students (Zainuddin & Shamri, 2018) and it contradicts the result of the study done by Lin Loo et al. (2013) that presented that nearly three-quarters of the respondents from six different universities in Malaysia had poor knowledge of CRC. The difference in the

findings may be due to the respondents from the previous study were non-medical science students meanwhile, the respondents from this current study are medical science students.

This current study discovered that nearly all the respondents could identify CRC as a type of large intestine cancer which similar to study by Zainuddin and Shamri (2018). However, Abdul Rahman M.F. Nahas et al. (2013) studied undergraduate and postgraduate students in USM found a discouraging result with less than half of the respondents able to define CRC correctly.

As for the risk factors of CRC, personal or familial history of CRC, alcohol consumption, low intake of whole-grain fibre, fruits and vegetables, cigarette smoking, lack of physical activities, high consumption of processed meat and obesity are the most often chosen answers. The previous study also revealed the same result, except in that study, lack of physical activities was one of the least identified risk factors along with the low intake of calcium (Zainuddin & Shamri, 2018). Meanwhile, the least identified risk factors are only low intake of calcium. Consumption of calcium has an inverse relationship with the risk of developing CRC. High intake of calcium can increase the prevention of CRC, especially when calcium intake is more than 500 mg/day; it can help in reducing the risk of CRC (Han et al., 2015). Another study was done among university students in a Caribbean territory also have the same findings (Rocke, 2019).

Age is a non-modifiable risk factor for CRC. According to the American Cancer Society, CRC is common among people aged 50 years old and above. In the current study, the question "In the next year, who is the most likely to develop bowel cancer?" had been asked to the participants, and the majority chose 60 years old. This finding is coherent with previous studies such as Zainuddin and Shamri (2018), Ustundag et al. (2019), and Akduran and Cinar (2015). However, to our surprise, more than half of the respondents in the present study said that CRC unrelated to age that similar to a community-based research done by Sindhu et al. (2019). Despite of that, a study by Weinberg and Marshall (2019) revealed that in the past two decades, the incidence of CRC among people younger than 50 years old has increased, and since 2000, the death rate also has increased.

The ability to identify the warning signs of CRC is as crucial as the ability to identify the risk factors. As expected, more than half of the respondents can recognize the warning signs such as a change in bowel habits, blood in stool, abdominal pain, unexplained weight loss, weakness, and malaise. Earlier studies conducted by Ustundag et al. (2019) and Mhaidat et al. (2016) also noted similar answer. In correspond to this present study, a community-based study done in Klang valley also found that the majority of its participants too can recall warning signs as the present study.

Screening is essential for early detection of cancer and improvement in the chance for better prognosis (Al-Naggar & Bobryshev, 2013). More than half of the participants were able to identify the screening test for CRC. The most recognized screening method is colonoscopy, followed by Fecal Occult Blood Test (FOBT), flexible sigmoidoscopy and Double Contrast Barium Enema (DCBE). This result shows an improvement compared to the previous study done by Al-Naggar and Bobryshev (2013) and Zainuddin and Shamri (2018). In the study by Zainuddin and Shamri (2018), only colonoscopy is the most recognized screening method, while in the study by Al-Naggar and Bobryshev (2013), more than half of the participants, including medical students, did not know any CRC screening methods such as colonoscopy, Double Contrast Barium Enema (DCBE) and FOBT. Sadly, among the respondents in the present study that able to detect the correct screening methods for CRC, less than half know the recommended age to start and the frequency to perform the screening test, which begins at the age of 50 years old for every 10 years and every year for colonoscopy and FOBT respectively. Meanwhile, for DCBE and flexible sigmoidoscopy, both are recommended to start at the age of 50, and its frequency is every 5 years (El Zoghbi & Cummings, 2016). This finding is also in line with the previous finding, and this may be due to the information related to CRC screening guidelines that have not yet been made public. Furthermore, different organizations have different CRC screening recommendations, thus confusing the public (Zainuddin & Shamri, 2018).

#### 4.2 The Levels of awareness of CRC

The level of awareness of CRC among nursing students at Puncak Alam is generally good. This was based on a high percentage of more than three-quarters aware that bowel cancer is among the top cancers inside Malaysia. This study is aligns with the research by Ustundag et al. (2018) but contradicts with Rocke (2019) study. The good results are because nursing education influences the level of awareness of CRC (Akduran et al., 2015). In addition, students in science faculties may have had more exposure to health studies, explaining their better awareness of cancer (Loo et al., 2013). It is proven with a study by Imran et al. (2018) that results in medical student's awareness levels were found better than the non-medical students.

Besides, the level of awareness toward CRC was also relatively good as the common risk factors such as obesity and family history of bowel cancer cited more than half of the respondents. The respondents also recognized inflammatory bowel disease as the highest risk factor but contradicts the research conducted by Rajamanicam et al. (2019). From a study by Keller et al. (2018), the risk of developing CRC is those with inflammatory bowel disease, and the outcomes were worse than those with sporadic CRC. The least CRC risk factor aware by respondent is old age, which oppose a study

by Radzi et al. (2014) that stated the occurrence of CRC is among those people aged 50 and above. This study result is different as the respondents may think certain modifiable risk factors such as physical inactivity from young age increased the risk of CRC (Hidayat et al., 2019).

Lastly, more than three-quarters of nursing students are aware that screening can find cancer early and earlier detection can potentially lead to a complete cure of the disease. According to the American Cancer Society, CRC that detected early enough before it spreads, the 5-year relative survival rate is around 90%. Veettil et al. (2017) also stated that the higher chances of survival for patients with CRC if the earlier stage was diagnosed through detection.

#### 4.3 Relationship Between Levels of Knowledge of CRC With Sociodemographic Data

This study shows that there is no significant relationship between the level of knowledge and gender that similar to the study by Abdul Rahman M.F. Nahas et al. (2013). Nevertheless, this study results are incongruent with the other previous studies. Most of the studies presented that female had statistically higher knowledge compared to male participants (Zainuddin & Shamri, 2019; Rocke, 2019; Imran et al., 2016 and Lin Loo et al., 2013). However, although there is no significant relationship that can be seen, the descriptive analysis shows that the percentage of female participants with a good level of knowledge is higher than male participants.

Meanwhile, a significant relationship between the level of knowledge of CRC and age group is seen in the current study. The data analysis presented that the percentage of respondents with a good level of knowledge is the lowest in the age group 21-years-old and below compared to the age group 22-23 years old and above 24-years old. This result is coherent with the result of an earlier study by Hani Rabab et al. (2018), which revealed a positive significant relationship.

There is a significant relationship seen in terms of the relationship of level of knowledge and year of study. The descriptive analysis revealed that year one has the lowest percentage of participants with good knowledge, followed by year two students. As expected, the highest percentage of participants with a good level of knowledge comes from the year three students. This finding aligns with the prior study, which found that grade one students have the lowest knowledge score compared to the student of higher grades (Ustundag et al., 2018). The same result is also shown in a study done by Hani Rabab et al. (2018).

#### 4.4 Relationship Between Levels of Awareness of CRC With Sociodemographic Data

There is no significant relationship between the levels of awareness of CRC with sociodemographic data. As for gender, the result is similar to Muhammad Imran et al. (2016) but contradicted with a study by Mhaidat et al. (2016). It may be due to unequal numbers of nursing students between

females and males. However, the female nursing students have higher awareness compared to male as female are more involved in cancer detection programs such as breast cancer (Nooijer et al., 2002).

Besides, for the age group, it was in line with a study by Mhaidat et al. (2016) that stated age of 20 years and above has a better awareness of CRC. This is because respondents aged above 24 years already undergo clinical attachment while those aged less than 21 years, mostly in year two. Cancer topic taught in the year two's curriculum thus fresh memory about symptoms and risk factors related to CRC still remembered.

Lastly, the year of education with levels of awareness contradicted a study done by Rajamanickam et al. (2019). Environmental exposure to clinical studies has shown positive in the development of awareness (Pietrzyk et al., 2015) as result year three have more awareness but due to Covid-19 interfere with the placements of nursing students at the hospitals (Mwila et al., 2020). The ability to learn and grow was reduced because they do not have access to an appropriate clinical learning environment (K Vela, 2018).

#### 4. CONCLUSION

In conclusion, this study revealed that the levels of knowledge and awareness of CRC among nursing students at Puncak Alam are generally good. The Internet was the first source to get information about CRC among the nursing students, followed by educational sources. This study also proves that sociodemographic data that have a significant relationship with the levels of knowledge of CRC were age and year of education while no significant relationship between the levels of awareness of CRC with sociodemographic data. Strategies on increasing knowledge and awareness regarding types and age to start screening should be implemented, and further research in multi-racial was also recommended.

#### ACKNOWLEDGEMENTS

The authors acknowledge all the participants who took part in this study. Thanks to UiTM Research committee for the ethical approval and Dr Sharifah who have helped in the data analysis for our study.

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