RESEARCH ARTICLE

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Knowledge and Perceptions of the Public vis-a-vis Colorectal Cancer Information in Newspapers in Malaysia

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Abstract

Objective: The study examines knowledge and perceptions of colorectal cancer vis-à-vis colorectal cancer information in newspapers in Malaysia. **Methods:** A total of 152 respondents filled in a 76-item questionnaire based on the Health Belief Model. Articles on colorectal cancer in three English newspapers in Malaysia from 1 January to 30 June 2022 were analysed. **Result:** A majority of the Malaysian respondents had low experiential knowledge of colorectal cancer, high perceived severity, low perceived susceptibility, and low to moderate susceptibility based on self-reported lifestyle and health conditions. The diet factor puts a majority of respondents at risk but smoking, alcohol drinking, and large intestine problems are risk factors for less than 10% of the group. The respondents believed in the benefits of seeking treatment but they were only marginally positive as to whether quitting smoking and losing weight could reduce colorectal cancer risk. They reported strong response efficacy and self-efficacy but the top barriers were lack of knowledge and cost. The strongest cue to action for their health protective intentions was news about colorectal cancer in newspapers, magazines, television and youtube. There were positive moderate correlations among perceived severity, benefits, response efficacy, self-efficacy, cues to action, and intention. Little salience was given to colorectal cancer in the three English newspapers based on the number of articles (N=10). The high frequency of information on severity, susceptibility, and benefits of lifestyle changes and screening in the newspaper articles are reflected in questionnaire results on better knowledge. Lack of information and cost prevented respondents from seeking screening or treatment, despite attempts by the newspaper articles to address barriers. **Conclusion:** The study suggests a need to heighten cues to action in the mass media and social media by providing information on cost and practical details of colorectal cancer screening and benefits of diet-related risk factors.

Keywords: Colorectal cancer- experiential knowledge- perceptions- newspaper- Health Belief Model

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Introduction

Colorectal cancer (CRC) is a type of cancer that develops in the colon or rectum, and is also known as bowel cancer, colon cancer, or rectal cancer [1]. Blood in the stool, changes in bowel habits (e.g., diarrhea, constipation, tenesmus), unexplained weight loss, rectal bleeding, abdominal or pelvic pain, weakness and fatigue, and unexplained anemia are all possible signs and symptoms of colorectal cancer [2]. Worldwide, colorectal cancer is the fourth most prevalent cancer in males and the third most common cancer in women, with considerable regional differences in colorectal cancer distribution [3]. In recent years, increasing incidence of colorectal cancer have been observed in newly industrialised countries around the world, where the risk was previously minimal [4]. The Ministry of Health Malaysia [2] reports that Colorectal cancer is the second most common cancer in Malaysia and contributed to 13.5% of all new cancer cases diagnosed in 2012-2016. The incidence increased with age and is slightly higher among males (14.8/100,000) than female (11.1/100,000). Colorectal cancer is one of the cancers which is highly preventable and treatable through early detection. However, the 2012-2016 cancer report showed around 70% of colorectal cancer patients in Malaysia were diagnosed at stage III or IV. The risk factors of colorectal cancer are lifestyle factors, particularly diet, physical activity and smoking, as reported by the International Agency for Research on Cancer (IARC) World Cancer Report 2020. Colorectal cancer is also linked to old age, with only a small number of cases due to underlying genetic disorders [5].

Studies of public awareness of symptoms and risk factors of colorectal cancer in Malaysia reveal that knowledge is poor. Ooi et al.'s [6] study of 197 primary care physicians in public primary care clinics in Kuala Lumpur using a 30-item questionnaire showed moderate knowledge of CRC screening modalities (48.7% ± 17.7%)

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and knowledge is not significantly associated with the practice of screening. Yusoff et al. [7] found that only 21.3% among 127 private general practitioners in Kelantan had good knowledge and 3.9% had good practice on colorectal cancer screening, and practice is associated with years of experience. In the study, only 58.3% were aware of the current recommendation on colorectal cancer screening, and most of them refer patients for a colonoscopy rather than for faecal occult blood test (FOBT) refer average-risk patients because of their refusal and tedious procedures. As for the public, Schliemann et al.'s [8] quasi-experimental study in Rawang, Selangor showed that over 65% of 484 participants recognised the "Be Cancer Alert Campaign" on colorectal cancer, and they reported significantly greater awareness of the symptoms at follow-up and confidence about noticing symptoms (46.9%) than those who did not recognise the campaign (34.9%, $p=0.018$). However, there was no difference between groups in terms of self-efficacy to see a doctor about symptoms. The top barrier to screening uptake in Malaysia is fear of results, and the other barriers are embarrassment of screening, absence of symptoms, fear of discomfort and cost, based on Su et al.'s [9] systematic review of colorectal cancer research. In Sarawak, Jores et al.'s [10] study of 829 respondents showed that preventive behaviour on colorectal cancer is predicted by age, gender, ethnicity, functional health literacy, and knowledge. However, Ibrahim et al.'s [11] findings in northern West Malaysia indicated that the incidence rates and mortality risk is not higher for older colorectal patients.

The studies reviewed above indicate low to moderate knowledge and awareness of colorectal cancer after exposure to campaign materials, where knowledge is measured using factual questions in questionnaires [6, 8, 10, 11]. The knowledge constitutes head knowledge or textbook knowledge, where information is understood using the thinking mind and usually stays in the form of knowledge and does not translate to action. Knowledge of diseases has not been studied in terms of personal knowledge derived from individuals or their families and close friends having had the disease, their experience of undergoing medical tests for it, and their work (studies) that deal with the disease. Experiential knowledge is defined as "the truth learned from personal experience with a phenomenon rather than truth acquired by discursive reasoning, observation, or reflection on information provided by others" [12]. The experiences of patients become sources of knowledge and support for others who empathise with them [13]. Experiential knowledge may be potentially more life-changing in terms of adoption of health protective behaviours but little is not known about whether experiential knowledge serve as cues to health protective action on colorectal cancer risk due to lack of studies.

In addition, it is important to study the public's knowledge and perception of colorectal cancer together with the newspaper coverage on the cancer because media plays a role in creating awareness. Newspapers can play a significant role in shaping public opinion. Stryker, Moriarty, and Jensen [14] found that the public in the United States have better knowledge of certain cancer risk factors when these are given prominent coverage in newspapers. Analysing how colorectal cancer is portrayed in newspapers allows researchers to understand how framing of certain information or the language used may influence public perception and attitudes. Furthermore, our comprehensive literature search did not uncover studies that examine whether salient themes in newspaper articles are reflected in better knowledge of those aspects of colorectal cancer among members of the public.

The aim of this study was to examine knowledge and perceptions of the public vis-à-vis colorectal cancer information in newspapers in Malaysia. The research questions addressed were:

(1). Are there relationships between own lifestyle conditions (smoking, weight, alcohol consumption, fast food consumption, intake of sugary food and drinks, intake of fruits and vegetables, physical exercise) and perceptions of whether these are risk factors of colorectal cancer?

(2). Are there relationships between self-efficacy and intention to minimise risk factors of colorectal cancer (increase vegetable and fruit intake, stop smoking, increase regularity of exercise, going for medical tests, stopping alcohol consumption, losing weight, stopping red meat consumption, stopping unhealthy food intake)?

(3). Are there relationships between experiential knowledge of colorectal cancer and perceptions of risk, severity, benefits, barriers, response efficacy, self-efficacy, cues to action, and intention?

(4). Are there relationships between selected demographic characteristics (age, education, income) and perceptions of risk, severity, benefits, barriers, response efficacy, self-efficacy, cues to action, and intention to minimise colorectal cancer risk?

(5). Are there relationships between perceptions of risk, severity, benefits, barriers, response efficacy, self-efficacy, cues to action, and intention to minimise colorectal cancer risk?

Materials and Methods

Respondents

The descriptive study involved questionnaire data from 152 respondents on knowledge, attitudes and perceptions of colorectal cancer, and content analysis of representation of colorectal cancer in newspapers. The respondents were selected using purposive sampling whereby they fulfilled the selection criteria: (1) they are above the age of 18, and (2) Malaysians living in Sarawak state at the time of the study although they may originate from other parts of Malaysia. Experience of having colorectal cancer was not an exclusion criterion.

Table 1 shows that the questionnaire respondents were mostly female (75%), in their twenties (95.39%), not married (96.71%), had degrees (82.24%) and 90.79% were not working. Out of 152 respondents, 42.76% were Malay, 36.84% Indigenous, 9.87% Indian, 9.21% Chinese, and 1.32% Others.

Newspapers

As for the colorectal cancer information in newspapers,

Table 1. Background Information of Respondents (N=152)

Background information		Frequency	Percentage
Gender	Female	114	75
	Male	38	25
Age	21-30	145	95.39
	31-50	7	4.61
Ethnic background	Malay	65	42.76
	Indigenous	56	36.84
	Indian	15	9.87
	Chinese	14	9.21
	Others	2	1.32
Marital status	Not married	147	96.71
	Married/Divorced	5	3.29
Education	Form 5	1	0.66
	Form 6	22	14.47
	Diploma	4	2.63
	Degree or higher	125	82.24
Monthly income	Not working	138	90.79
	Below RM2000	4	2.63
	RM2000-RM3999	6	3.95
	RM4000 and above	4	2.63
Religion	None	2	1.32
	Buddhist	3	1.97
	Christian	57	37.5
	Hindu	12	7.89
	Muslim	77	50.66
	Others	1	0.66

a search was made in the online portals of three leading English newspapers using the term "colorectal cancer" from 1 January to 30 June 2022. The newspapers were selected because they were leading mainstream newspapers (New Straits Times, The Star) and an alternative newspaper (The Sun) in Malaysia.

Instrument

The 76-item questionnaire, based on Hochbaum et al.'s [15] Health Belief Model, was adapted from Ting et al. (2021). The questionnaire elicited data on demographic background (10 items), knowledge (6 items), perceived risk (11 items), perceived severity (7 items), perceived benefits of health protective measures (10 items), perceived barriers (8 items), response efficacy (4 items), self-efficacy (8 items), intended behaviour (9 items) and cues to action (5 items). Most of the items were on a five-point Likert scale.

Data collection and analysis procedures

For the questionnaire, the second researcher announced the study in Whatsapp groups. The Google form link was sent to social contacts. The results were analysed and descriptive statistics were reported.

For the newspaper articles, content analysis was conducted to identify types of information presented on colorectal cancer in the newspaper articles based on the Health Belief Model, and frequencies were calculated. The qualitative analysis uncovers the knowledge that is disseminated to the public about the cancer, and may explain knowledge levels of the respondents.

Results

Experiential knowledge of colorectal cancer

In this study, knowledge of colorectal cancer is based on direct personal experiences of having colorectal cancer (self, family, friends) and indirect experiences with the cancer such as work or studies. Experiential knowledge of colorectal cancer was computed based on five items, where "0" is given to a "no" answer and "1" is given to a "yes" answer). The results showed low experiential knowledge of colorectal cancer (M=0.27). Only a small percentage of their family (15.79%) and close friends or colleagues (7.89%) had colorectal cancer. Even fewer had done medical tests for colorectal cancer (1.32%) or worked with the cancer (1.97%). None of them had colorectal cancer themselves. Experiential knowledge is not significantly associated with Health Belief Model constructs (severity, susceptibility, benefits, barriers, response efficacy, self-efficacy, cues to action, and intention).

Table 2 shows that 34.21% of respondents had looked for information on colorectal cancer (e.g., articles, YouTube), but this was not considered as experiential knowledge because they were only reading about it or watching video materials on it.

Perceived severity of colorectal cancer

On respondents' perception of the severity of colorectal cancer, Table 3 shows that they believed that colorectal cancer was a severe disease, leading to fatality (M=4.38). A majority believed that colorectal cancer causes pain in the abdomen (M=4.22), general weakness (M=4.16), blood in their stool (M=4.05), extreme weight loss (M=3.88), constipation (M=3.82) and diarrhoea (M=3.63). Based on their responses, the respondents were aware of the signs and symptoms of colorectal cancer.

Table 2. Knowledge of Colorectal Cancer (N=152)

Questionnaire item	Total of "yes"	Percentage
1. Have you looked for information on colorectal cancer (e.g., articles, YouTube)?	52	34.21
2. Have any of your family (e.g., parents, aunt, uncle, grandparents) had colorectal cancer?	24	15.79
3. Have any of your close friends or colleagues had colorectal cancer?	12	7.89
4. Have you done medical tests for colorectal cancer?	2	1.32
5. Does your work deal with colorectal cancer?	3	1.97
6. Have you had colorectal cancer?	0	0

Table 3. Perception on Severity to Colorectal Cancer (N=152)

Questionnaire item	Mean	SD
1. I believe that colon cancer can kill.	4.38	0.83
2. I believe that colorectal cancer causes pain in the abdomen.	4.22	0.85
3. I believe that colorectal cancer makes people feel very weak.	4.16	0.85
4. I believe that colorectal cancer causes people to have blood in their stool.	4.05	0.94
5. I believe that colorectal cancer makes people become very thin.	3.88	0.95
6. I believe that colorectal cancer causes people to have constipation.	3.82	0.85
7. I believe that colorectal cancer causes people to have diarrhoea.	3.63	0.89

Table 4. Self-Reported Health Condition in Terms of Risk Factors (N=152)

Questionnaire item		Frequency	Percentage
Smoking habit	Non-smoker	112	73.68
	Non-smoker but live with smokers	22	14.47
	Ex-smoker	5	3.29
	Smoke less than 10 cigarettes/day	8	5.26
	Smoke 11-19 cigarettes/day	2	1.32
	Smoke more than 20 cigarettes/day	3	1.97
Alcohol drinking	Do not drink	89	58.55
	A few times a year	50	32.89
	A few times a month	8	5.26
	A few times a week	4	2.63
	Almost everyday	1	0.66
Eating dairy products	Do not eat dairy products	4	2.63
	A few times a year	9	5.92
	A few times a month	64	42.11
	A few times a week	49	32.24
	Almost everyday	26	17.11
Body weight	Very underweight	4	2.63
	A little underweight	18	11.84
	Just the right weight	67	44.08
	A little overweight	47	30.92
	Very overweight	16	10.53
Eating fast food	Do not eat fast food	2	1.32
	A few times a year	11	7.24
	A few times a month	64	42.11
	A few times a week	54	35.53
	Almost everyday	21	13.82
Taking high sugar food and drinks	Do not take high sugar food and drinks	2	1.32
	A few times a year	9	5.92
	A few times a month	39	25.66
	A few times a week	65	42.76
	Almost everyday	37	24.34
Eating red meat	Do not eat red meat	15	9.87
	A few times a year	24	15.79
	A few times a month	59	38.82
	A few times a week	46	30.26
	Almost everyday	8	5.26
Eating vegetables and fruits	Do not eat vegetables and fruits	0	2.63
	A few times a year	3	0
	A few times a month	19	1.97
	A few times a week	82	12.5
	Almost everyday	48	53.95
Having physical activity	Do not move about	1	0.66
	Walking	95	62.5
	Moderate physical activity	25	16.45
	Vigorous physical activity that causes breathing hard once per week	18	11.84
	Vigorous activity that causes breathing hard a few times a week	13	8.55
Problems with large intestine	No problem	109	71.71
	A few times a year	28	18.42
	A few times a month	9	5.92
	A few times a week	5	3.29
	Almost everyday	1	0.66

Perceived susceptibility to colorectal cancer

The results show that the respondents felt that they were unlikely to get colorectal cancer (M=2.07, SD=1.08; not shown in Tables). Their susceptibility to colorectal cancer might not be as low as they believed because 15.79% of the respondents had family who contracted the cancer (Table 2).

Table 4 shows susceptibility based on respondents' self-reports of their health condition. The following do not pose much risk for this group: smoking, consumption of alcohol and dairy products, and large intestine problems. Tobacco smoking is a risk factor for 8.55% of respondents (5.26% smoke less than 10 cigarettes/day; 1.32% smoke 11-19 cigarettes/day; 1.97% smoke > 20 cigarettes/day). A majority (73.68%) were non-smokers but 14.47% were non-smokers who live with smokers and 3.29% were ex-smokers.

It is important to study respondents' alcohol consumption patterns because even one standard drink per day can increase colorectal cancer risk. A 10-g increase in daily alcohol consumption increased colorectal cancer risk by 7% overall, 8% for men and 4% for women [16]. Therefore, drinking alcohol a few times a month and higher frequencies are grouped together as a risky group. Based on this, alcohol consumption was a risk factor for only 8.55% of respondents (5.26% drink a few times a

Table 5. Perceived Benefits of Preventive Measures for Colorectal Cancer (N=152)

Questionnaire item	Mean	SD
1. Seeking treatment when I have signs of colorectal cancer will decrease my chances of dying from the cancer.	4.45	0.76
2. Eating vegetables and fruits will increase chances of preventing colorectal cancer.	4.39	0.84
3. Being alert to family history of colorectal cancer will increase chances of detecting it early.	4.34	0.89
4. Going for regular tests (e.g., blood tests, colorectaloscopy) will increase chances of preventing colorectal cancer.	4.17	0.95
5. Reducing unhealthy food (i.e. fatty food, sugary food) will decrease chances of getting colorectal cancer.	4.16	0.97
6. Doing exercise will increase chances of preventing colorectal cancer.	4.14	0.89
7. Quitting drinking alcohol will decrease chances of getting colorectal cancer.	4.02	1.03
8. Eating less red meat (i.e. beef, lamb, deer) will increase chances of preventing colorectal cancer.	3.82	0.94
9. Quitting smoking will decrease chances of getting colorectal cancer.	3.64	1.11
10. Losing weight will decrease chances of getting colorectal cancer.	3.16	1.11

Note: 1, strongly disagree; 2, disagree; 3, neutral; 4, agree; 5, strongly agree

Table 6. Perceived Response Efficacy towards Cancer Treatment (N=152)

Questionnaire item	Mean	SD
1. I believe colorectaloscopy (i.e. a tube with a small video camera is put into the large intestine) can accurately detect colorectal cancer.	3.98	0.87
2. I believe surgery (removing a part of the large intestine) is effective for treating colorectal cancer.	3.78	0.93
3. I believe blood tests can accurately detect colorectal cancer.	3.58	0.95

Note: 1, strongly disagree; 2, disagree; 3, neutral; 4, agree; 5, strongly agree

month; 2.63% a few times a week; 0.66% drink almost everyday). As much as 58.55% did not drink while 32.89% were social drinkers who drink a few times a year. Our study showed that 80.27% were at low colorectal risk due to their regular intake of dairy products.

Only 9.87% reported frequent problems with their large intestine (5.92% a few times a month; 3.29% a few times a week; 0.66% almost everyday) while 71.71%

Table 7. Perceived Barriers towards Colorectal Cancer Testing (N=152)

Questionnaire item	Mean	SD
1. I have no idea how to go about getting medical tests for colorectal cancer (e.g., blood test, colorectaloscopy).	3.49	1.24
2. It costs too much for me to go for colorectal cancer testing/treatment.	3.48	1.2
3. I don't have signs of colorectal cancer, so I don't need testing.	3.28	1.19
4. I am too busy to go for colorectal cancer tests.	3.11	1.24
5. I am afraid to know whether I have colorectal cancer or not, so I don't want to go for tests.	3.1	1.31
6. I am afraid that the tests will be painful, so I don't want to go for tests.	3.05	1.31
7. I have transport problems to go for colorectal cancer testing/treatment.	2.82	1.42
8. I feel ashamed if other people think that I have colorectal cancer, so I don't want to go for tests.	2.33	1.25

Note: 1, strongly disagree; 2, disagree; 3, neutral; 4, agree; 5, strongly agree

Table 8. Respondents' Self-Efficacy to Reduce Colorectal Cancer Risk

Questionnaire item	Mean	SD
1. I am confident that I can eat a lot of vegetables and fruits to reduce colorectal cancer risk.	4.2	0.94
2. I can confident that I can stop smoking (either active smoking or second-hand smoking) to reduce colorectal cancer risk.	4.16	0.96
3. I am confident I can do regular exercise to reduce colorectal cancer risk.	4.09	0.93
4. I can confident that I can go for medical tests to detect colorectal cancer early.	4.04	0.93
5. I am confident I can stop drinking alcohol to reduce colorectal cancer risk. (Answer 3 if you do not drink)	3.93	1.03
6. I am confident that I can lose weight to reduce colorectal cancer risk.	3.91	0.98
7. I can confident that I can stop eating red meat (i.e. beef, lamb, deer) to reduce colorectal cancer risk.	3.59	1.24
8. I am confident that I can stop eating unhealthy food (i.e. fatty food, sugary food) to reduce colorectal cancer risk.	3.54	1.26

Note: 1, refers to not confident at all; 2, refers to not very confident; 3, refers to neutral; 4, refers to fairly confident; 5, refers to confident

Table 9. Cues to Taking Preventive Measures Concerning Colorectal Cancer

Questionnaire item	Mean	SD
1. Colorectal cancer awareness messages (e.g., articles in newspapers and magazines, television or youtube) makes me want to carry out preventive measures.	3.7	1.1
2. News of a friend or family member getting colorectal cancer makes me want to carry out preventive measures (e.g., lifestyle changes, going for tests).	3.65	1.16
3. People around me always remind me to do lifestyle changes to prevent colorectal cancer (e.g., stop smoking, stop drinking, have a healthy diet, exercise).	3.44	1.22
4. I think I might have some symptoms of colorectal cancer, so I want to see a doctor to check it out.	2.98	1.38
5. People around me always ask me to go for colorectal cancer tests.	2.69	1.33

Note: 1, refers to strongly disagree; 2, refers to disagree; 3, refers to neutral; 4, refers to agree; 5, refers to strongly agree

Table 10. Respondents' Intended Behaviour Concerning Colorectal Cancer (N=152)

Questionnaire item	Mean	SD	Correlation with self-efficacy
1. I plan to eat a lot of vegetables and fruits to reduce colorectal cancer risk.	4.39	0.76	0.634*
2. I plan to do regular exercise to reduce colorectal cancer risk.	4.21	0.88	0.618*
3. I plan to stop smoking (both active smoking and second-hand smoke) to reduce colorectal cancer risk.	4.16	1.03	0.547*
4. I plan to increase my knowledge of colorectal cancer (e.g., risks, symptoms, prevention, tests, treatment).	4.14	0.93	Not available
5. I plan to stop drinking alcohol to reduce colorectal cancer risk.	4.1	1.02	0.485*
6. I plan to go for testing to check if I have colorectal cancer.	3.97	1.03	0.499*
7. I plan to lose weight to reduce colorectal cancer risk.	3.95	1.06	0.468*
8. I plan to stop eating unhealthy food (fatty food, sugary food) to reduce colorectal cancer risk.	3.89	1.07	0.565*
9. I plan to stop red meat (beef, lamb, deer) to reduce colorectal cancer risk.	3.73	1.12	0.619*

Notes: *p<.05; 1, refers to strongly disagree; 2, refers to disagree; 3, refers to neutral; 4, refers to agree; 5, refers to strongly agree

had no problems and 18.42% experienced occasional problems a few times a year. The problems referred to in the questionnaire item are pain in abdomen and blood in stool.

Close to half of the respondents were at moderate risk of colorectal cancer based on their body weight, consumption of fruits and vegetables, and physical activity. For body weight, 44.08% reported that their weight was just right, while 14.47% felt they were underweight but 41.45% had the obesity risk factor. A total of 68.42% of respondents might have a low risk due to their regular intake of fibres (1.97% eat fruits and vegetables a few times a month; 12.50% a few times a week; 53.95% almost everyday). As for exercise, 36.84% of respondents had moderate to vigorous physical activity while the rest had little exercise (0.66% did not move about much; 62.50% performed the minimal walking when performing daily activities).

However, the notable risk factors for the respondents who were mostly in their twenties and thirties were fast food consumption, high sugar intake, and red meat consumption. Fast food consumption is a risk factor for 92.76% (25.66% a few times a month; 42.76% a few times a week; 24.34% almost everyday). As for consumption of high sugar food and drinks 92.76% of respondents were

Table 11. Pearson Correlation Results for Demographic Characteristics and Perceptions of Colorectal Cancer (N=152)

	Age	Education level	Income level	Risk	Severity	Benefits	Barrier	Response efficacy	Self-efficacy	Cues to action	Intention
Age	1	-0.068	0.591*	-0.084	-0.05	0.071	-0.092	-0.009	-0.047	-0.067	-0.095
Education level		1	0.122	-0.033	0.094	0.058	-0.067	0.027	0.058	0.11	0.064
Income level			1	-0.111	-0.075	0.031	-0.144	-0.116	-0.057	-0.117	-0.084
Risk				1	0.123	-0.017	0.074	0.01	-0.12	0.072	-0.014
Severity					1	0.522	0.102	0.524*	0.227	0.252	0.413*
Benefits						1	0.138	0.402*	0.444*	0.267	0.528*
Barriers							1	0.187	0.003	0.215	0.047
Response efficacy								1	0.356	0.348	0.361
Self-efficacy									1	0.343	0.719*
Cues to action										1	0.530*
Intention											1

Note: *p<0.05

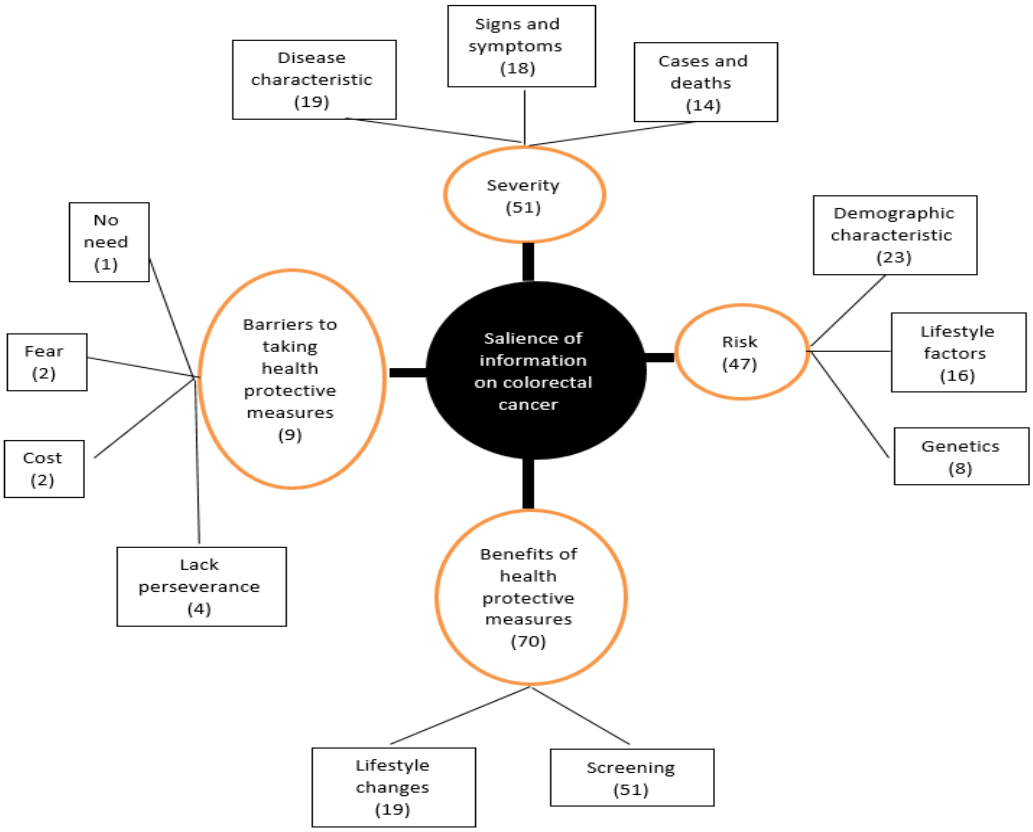

Figure 1. Newspaper Portrayal of Colorectal Cancer based on Health Belief Model

at risk (5.92% a few times a month; 25.66% a few times a week; 42.76% almost everyday). This includes cakes, pastry, coffee, tea, and soft drinks. Red meat consumption was also rather high for 74.34% of the respondents (38.82% a few times a month; 30.26% a few times a week; 5.26% almost everyday) but 9.87% did not eat red meat.

To sum up, the self-reported health conditions showed that the respondents' consumption of fast food, high sugar food and drinks and red meat is worrying but smoking, consumption of alcohol, and large intestine problems were risk factors for less than 10% of the group.

Perceived benefits of preventive measures for colorectal cancer

Table 5 shows that the respondents strongly believed in the benefits of seeking treatment when signs present (M=4.45), and checking if there was a family history (M=4.34). The respondents also strongly believed in the benefits of a healthy lifestyle for colorectal cancer prevention, such as eating vegetables and fruits (M=4.39), reducing unhealthy food (M=4.16), increasing exercise (M=4.14), quitting alcohol (M=4.02), and eating less red meat (M=3.82). The respondents also believed that in the usefulness of regular screening such as blood tests and colorectaloscopy (M=4.17).

However, the respondents were only marginally positive that quitting smoking would decrease colorectal cancer risk (M=3.64) and were almost neutral about losing weight as a preventive measure (M=3.16). Interestingly, there was a significant positive correlation between own smoking status and perception of whether quitting smoking could decrease colorectal cancer risk, r(150)=0.036, p=0.05. They had head knowledge of the dangers of smoking, and the heavier smokers had stronger beliefs that ceasing smoking could decrease the risk – but to move to the step of quitting smoker is a different matter altogether. There was no significant relationship between own weight assessment and perception of whether losing weight could decrease colorectal cancer risk.

Perceived response efficacy of cancer treatment

Table 6 shows the perceived response efficacy towards cancer treatment. The respondents reported the greatest confidence in accurate detection of colorectal cancer using colorectaloscopy (M=3.98), followed by surgery (M=3.78) and blood tests (M=3.58).

Perceived barriers towards colorectal cancer testing

Table 7 shows that the two top barriers preventing respondents from colorectal cancer testing were lack of knowledge (M=3.70) and cost (M=3.57). There were mixed responses on the need for testing (M=3.28), busyness (M=3.11), fear to know whether they have colorectal cancer (M=3.10), pain (M=3.05), and transport problems (M=2.82). However, the respondents disagreed that they would feel ashamed if other people think that they have colorectal cancer (M=2.33); hence, it is not a barrier to screening. The results on barriers suggest that it is important to educate the public about colorectal cancer testing and the price of various tests. Sometimes the public may have misconceptions about the exorbitant cost.

Self-efficacy to reduce colorectal cancer risk

Table 8 shows that the respondents reported the highest self-efficacy to eat a lot of vegetables and fruits (M=4.20), stop smoking (M=4.16), exercise (M=4.09), go for medical tests (M=4.04), stop drinking alcohol (M=3.93), and lose weight (M=3.91). However, the respondents were the least confident about diet control, particularly abstaining from eating red meat (M=3.59) and unhealthy food (i.e. fatty food, sugary food).

Cues to action concerning colorectal cancer

Table 9 shows that the strongest cues to action to reduce colorectal cancer risk were articles in newspapers, magazines, television and youtube videos (M=3.70), reiterating the importance of analysing colorectal cancer information in newspapers. The second influential cue to action is news of a friend or family member getting colorectal cancer (M=3.65). The respondents slightly agreed that they considered reminders to adopt lifestyle changes by people around them but it was not as strong (M=3.44). The respondents had mixed responses on whether they had symptoms of colorectal cancer that they needed to check out (M=2.98), and this result is consistent with their low perceived risk (M=2.07), described earlier in the Susceptibility to Colorectal Cancer section. The respondents disagreed that people around them asked them to go for colorectal cancer tests (M=2.69). This indicates that subjective norm or social pressure to enact health protective measures is inclined towards lifestyle changes rather than screening.

Intention concerning colorectal cancer

The respondents reported the strongest intention to eat a lot of vegetables and fruits (M=4.39) as shown in Table 10. The next two intended behaviours were regular exercise (M=4.21) and quitting smoking (M=4.16), and the respondents reported confidence about these lifestyle changes.

Next, the respondents reported strong intentions to increase their knowledge of colorectal cancer (e.g., risks, symptoms, prevention, tests, treatment) (M=4.14) and to stop drinking alcohol (M=4.10). In comparison, intention to go for testing (M=3.97) and lose weight (M=3.95) were moderately strong, but diet changes (unhealthy food, red meat) were relatively more difficult for the respondents although they reported moderately strong intentions (M=3.89 and M=3.73 respectively).

The top three preventive measures that the respondents reported strong intention and high self-efficacy results were lifestyle changes, that is, eat a lot of vegetables and fruits, exercise, and quit smoking. The order of the two sets of results reported in Tables 8 and 10 are similar. Table 10 shows that the Pearson correlation coefficients for the pairs of items are positive and of moderate strength (between 0.468 and 0.634). This shows that perceived self-confidence and intended behaviour are linked, and if respondents believe that they can undertake certain health protective measures, they are more likely to have such intentions to translate their thoughts into action.

Correlations among variables for colorectal cancer

Pearson correlation coefficients were computed to assess the linear relationship between selected demographic characteristics (age, education, income) and perceptions of colorectal cancer (risk, severity, benefits, barriers, response efficacy on treatment, self-efficacy, intention, cues to action). However, no significant correlations were found (Table 11).

There were positive moderate correlations between perceived severity and benefits, $r(150) = 0.523$, $p = 0.005$, between perceived severity and response efficacy for colorectal cancer treatments, $r(150)=0.524$, $p=0.05$, and between perceived severity and intention, $r(150)=0.413$, $p=0.05$. When there is an increase in perceived severity, there is also an increase in perceived benefits, confidence in effectiveness of treatment, as well as intention to undertake these health protective behaviours. In other words, it is important to make the public aware of the severe consequences of contracting colorectal cancer or diagnosing it late so that they take health protective actions seriously.

Next, there are positive moderate correlations between perceived benefits and response efficacy, $r(150) = 0.402$, $p = 0.05$, between perceived benefits and self-efficacy, $r(150)=.444$, $p=0.05$, and between perceived benefits and intention, $r(150)=0.528$, $p=0.05$. Respondents who have stronger beliefs in the benefits of preventive measures are also more likely to have stronger confidence in the effectiveness of colorectal cancer treatment, self-confidence and intention to take health protective measures.

However, the strongest Pearson correlation coefficient is between self-efficacy and intention, $r(150) = 0.720$, $p = 0.05$. An increase in self-efficacy is associated with a stronger intention. The result indicates that in education programmes to create awareness of colorectal cancer, it is important to build up the self-confidence of the public to have a healthy lifestyle and to seek regular screening because this may translate to stronger intentions to adopt health protective measures that will reduce their colorectal cancer risk.

It is also important to note the positive moderate correlation between intention and cues to action, $r(150) = 0.530$, $p=0.05$. Cues to action are a direct trigger to intention. In the present study, the strong cues are from colorectal cancer awareness messages in the newspapers and social media, and news of others getting colorectal cancer. These are avenues to capitalise on in colorectal cancer awareness programmes for the young people in their twenties and thirties, as this is the main age group among the respondents.

Colorectal cancer information in newspapers

In this section, the content analysis results are explained, and the relevant questionnaire results are brought in to address possible links with the respondents' knowledge and perceptions.

Only 10 articles were published on colorectal cancer across the three English newspapers in a six-month period, showing lack of salience given to the disease. The content analysis identified 177 pieces of information on colorectal cancer (Figure 1). The most salient type of information was benefits of health protective measures (70

or 39.55%), followed by severity (51 or 28.82%), risk (47 or 26.56%) and lastly barriers to taking health protective measures (9 or 5.08%). By drawing attention to benefits of health protective measures, the newspaper articles used positive information to urge the public to take preventive measures to either minimise colorectal cancer risk or to detect it early. The positive information was balanced with seemingly fear-inciting and urgency-creating facts on severity of colorectal cancer and at-risk groups.

The types of severity information that the three newspapers alerted the public to are disease characteristics (19 instances), signs and symptoms (18 instances) and cases and deaths (14 instances). The explanations on how the tumour cells multiplied sought to educate the public about the need to catch the cancer early while the descriptions of the signs and symptoms of colorectal cancer are useful to alert the public to suspicious indications, the end point of which is death. Taken together, the severity information on colorectal cancer in the newspapers are informative enough to highlight the danger of the cancer, and the questionnaire results concur. Table 3, Items 1-5 are signs often mentioned in the newspaper articles and the mean scores are higher for abdominal pain, fatigue, blood in stool, and weight loss than for Items 6-7 (constipation and diarrhoea) because the latter are mentioned as changes in bowel habits and specific examples are not given in the articles.

As for risk, the newspaper articles highlighted demographic characteristics (23 instances) more than lifestyle factors (16 instances) and family history (8 instances). The demographic characteristics that are associated with higher colorectal cancer risk stated in the newspapers are being male, older and being Chinese (23 instances). The facts on smoking, alcohol intake, fast food, sugar food, and red meat consumption, among others, are clear enough to alert the public on the need to make lifestyle changes to reduce colorectal cancer risk.

Next, for benefits of health protective measures, interestingly, the newspaper articles gave salience to screening (51 instances), compared to lifestyle changes (19 instances). The articles reinforced the message that screening tests can detect precancerous polyps early, so that they can be removed before they cancerous [17]. The newspaper articles also urged older individuals to seek regular screening, and there was some information on screening procedures to educate the public and reduce their fear of the unknown. Next, given the repeated dissemination of information on risk factors in the newspaper articles, it is not surprising that the questionnaire results showed that the respondents were in strong agreement on the benefits of being alert to family history of colorectal cancer and making lifestyle changes to prevent colorectal cancer, such as increasing fibre intake, reducing unhealthy food, increasing exercise, quitting alcohol and smoking, and reducing red meat consumption (Table 5). Two newspaper articles mentioned diabetes as a risk factor for colorectal cancer but the questionnaire only indirectly examined respondents' perceived benefit of reducing unhealthy food (i.e. fatty food, sugary food). Interestingly, the newspaper articles did not highlight weight loss as a preventive measure. This translates to an almost-neutral response on the item ("Losing weight will decrease chances of getting colorectal cancer"), indicating that respondents hardly believed in the usefulness of this measure. One lifestyle change suggested in the newspaper articles is increasing exposure to sunlight to get Vitamin D, but the respondents were not asked for their perceptions on the benefits of this measure.

Finally, the newspaper articles also addressed barriers preventing adoption of health protective measures (9 instances), comprising mainly the lack of perseverance to continue with treatment and the cost involved. One of the articles analysed states that "many patients who were newly diagnosed with colon cancer postponed procedures, enhancing their risk that the cancer could progress" but the situation described is in the United States [18]. Moreover, in our study, the questionnaire results (Table 7) showed that the top barrier preventing respondents from seeking screening was lack of information on how to go about getting the tests. For the Malaysian public, the barrier is lack of knowledge. Our content analysis revealed that the newspapers were already filling in the gaps by explaining the details of some testing procedures but more frequent dissemination of this kind of practical details is probably needed.

Cost was another barrier addressed in the newspaper articles but they did not provide estimates or the range of the cost involved. The questionnaire results showed that cost is a barrier and this is where newspaper articles can play an important role in disseminating information. The negative feelings associated with colonscopy were not addressed in the newspaper articles and in our study, fear of painful tests and shame were not issues based on the questionnaire results.

Discussion

The study showed that self-reported perceptions of colorectal cancer matched the information disseminated in newspaper articles about the disease, indicating the crucial role of newspapers as a means of health communication to the Malaysian public. A majority of the respondents had low experiential knowledge of colorectal cancer, high perceived severity and low to moderate susceptibility based on self-reported lifestyle and health conditions. The diet factor putting them at risk includes fast food, sugary food, and red meat consumption but smoking, alcohol drinking, and large intestine problems are risk factors for less than 10% of the group. A majority of the respondents had regular consumption of dairy products, and fruits and vegetables. Barubes et al.'s [19] cohort studies showed a consistent significant decrease in colorectal cancer risk with an increase in intake of dairy products. A high consumption of fruit and vegetables is possibly associated with a lowered colorectal cancer risk [20]. The respondents believed in the benefits of seeking treatment when signs present, checking if there is a family history, adoption of a healthy lifestyle, and regular screening. The respondents were sufficiently aware that family history is a risk factor. "As many as one in three people who develop colorectal cancer have other family members who have had it" [21]. However, they were only marginally positive as to

whether quitting smoking and losing weight could reduce colorectal cancer risk.

They reported strong response efficacy and self-efficacy but the top barriers were lack of knowledge and cost. The Stool Occult Blood test only costs RM35 at Kedah Medical Centre [22] but the public tend to overrate the expense of colorectal tests. The strongest cue to action is news about colorectal cancer in newspapers, magazines, television and YouTube, urging them to make lifestyle changes and enhance their knowledge of colorectal cancer. There are positive moderate correlations among perceived severity, benefits, response efficacy, self-efficacy, cues to action, and intention to minimise colorectal cancer risk. However, experiential knowledge is not associated with these Health Belief Model constructs but self-efficacy is strongly correlated with intention.

Little salience was given to colorectal cancer in the three English newspapers as there were only 10 articles in the six-month period. The high frequency of information on severity, susceptibility, benefits of lifestyle changes and screening in the newspaper articles are reflected in questionnaire results. However, the barriers to taking health protective measures giving attention in the articles was lack of perseverance in keeping medical appointments which is a problem happening in the United States [18]. The Malaysian public may not opt out of screening or treatment once the medical appointment has been set because Yusoff et al.'s [23] study on barriers to colorectal screening and treatment did not identify this as a barrier. Therefore, the newspaper articles did not address the barriers that affect the Malaysian respondents in the present study, that is, cost and lack of information on colorectal cancer screening and treatment. "Screening is cheaper than treating colorectal cancer if compliance rates are high and the costs of screening tests are reasonable" [24]. In Yusoff et al.'s [23] study, 11.2% of the respondents said that they did not receive advice for screening. A study conducted by Universiti Malaya involving 508 respondents with no family history found that 5% were not willing to undergo immunochemical fecal occult blood test (iFOBT) because they did not know much about the test but the main reason for 59% to refuse the screening is because they did not exhibit symptoms [25]. A previous study by Yusoff et al. [23] showed that patients did not participate in screening because they were embarrassed (35.2%) and felt uncomfortable (30.0%). The embarrassment may be linked to the immunochemical fecal occult blood test (iFOBT) test which required them to handle stool. Yusoff et al.'s [23] results were applicable more than a decade ago, and the active awareness programmes by health authorities and NGOs in recent years may have made the public more knowledgeable about colorectal cancer and reduced barriers to seeking screening and treatment. Nevertheless, the comparison of knowledge and perceptions of the public on colorectal cancer and the focus of newspaper articles reveal areas needing attention by media and health communication practitioners to bring about better public health.

In the present study, the comparison of results from the content analysis of newspapers and questionnaires appears to be based on the assumption that respondents read the newspaper articles on colorectal cancer. In reality, they may learn about colorectal cancer from other sources of information such as YouTube. This constitutes a limitation of the study. Another limitation of this study is the concentration on the under-50 age group among the respondents. Hence, the findings are applicable to the younger age group, like the diet factors (fast food, high sugar, red meat) being the main risk factors for the respondents. Although individuals in the above-50 age group are at higher risk of developing colorectal cancer, it is important to target the younger age group in awareness programmes so that they can adopt a lifestyle that puts them at low risk of colorectal cancer later in their lives. Based on our study, an implication of the findings is that mass media and public service announcements in social media need to be informative about cost and practical details of colorectal cancer screening and benefits of diet-related risk factors to strengthen cues to action. With better knowledge, the public may have greater intention to undertake measures to reduce colorectal cancer risk. It is also important to build up self-confidence in taking preventive measures to increase intention. Future studies can make cross-country comparisons to reach a more global understanding of public knowledge of cancer and the role of newspapers in creating awareness.

Author Contribution Statement

Su-Hie Ting conceptualised and designed the study, analysed and interpreted the quantitative data, revised the article, and approved the version to be submitted. Nicholas Mark Netto performed literature research, collected and analysed the data, drafted the article, and approved the version to be submitted.

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Approval

It is part of an approved student thesis.

Ethical Declaration

The study does not directly access patient data nor involve hospital subjects. The procedures in the study were in accordance with the ethical standards of the responsible committee on human experimentation (institutional) and with the Helsinki Declaration of 1975, as revised in 2000(5). Respondents were given information about the study, and informed about voluntary participation, confidentiality, dissemination of results, and withdrawal from the study. Informed consent was sought from respondents before they filled in the questionnaire. Ethical clearance for the study was obtained from the Human Research Ethics Committee (Non-Medical) of Universiti Malaysia Sarawak, HREC(NM)/2023(1)/53.

Data Availability

The collated data from this study used to support the findings of this study are available from the corresponding author upon request.

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