



## **Assessment of Perception, Awareness about Predictors of Colorectal Cancer of Hail Region Saudi Arabia population**

**Fahmida Khatoon<sup>1\*</sup>, Madiha Rabie Mahmood<sup>2</sup>, Sofian Talal Obeidat<sup>3</sup>,  
Munirah Abdalmohsin Mohammad Alsatti<sup>4</sup>, Reema Saleh Sulaiman Alanazi<sup>4</sup>,  
Razan Saud M. Abu Kabbos<sup>4</sup> Zahid Balouch<sup>5</sup> and Shimaa M. H. Obelanga<sup>6</sup>**

<sup>1</sup>Biochemistry Department, College of Medicine, Hail University, KSA, Saudi Arabia.

<sup>2</sup>Pharmacology Department, College of Medicine, University of Hail, KSA, Saudi Arabia.

<sup>3</sup>Department of Basic Science, Preparatory year Deanship of Hail, Hail University, KSA, Saudi Arabia.

<sup>4</sup>Students, College of Medicine, Hail University, KSA, Saudi Arabia.

<sup>5</sup>Technician, Jinnah University, Pakistan.

<sup>6</sup>Preparatory Year, Deanship of Hail, Hail University, KSA.

### **Authors' contributions**

*This work was carried out in collaboration among all authors. Author FK designed the study, performed the statistical analysis, wrote the protocol, and wrote the first draft of the manuscript. Authors MRM, STO, SMHO and ZB collected data and managed the analyses of the study. Authors RSSA, RSMAM and MAMA contributed in literature search, questionnaire preparation and finalized the manuscript. All authors read and approved the final manuscript.*

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### **ABSTRACT**

Colorectal cancer is one of the major malignancies world-wide, accounting for approximately 20% of incident cases. The incidence and mortality have dramatically increased over the past 10<sup>th</sup> decades in Saudi Arabia. It has been argued that the change in epidemiological pattern is due to the implementation of a way of life style, characterized by use of junk foods and lack somatic exercise. The pharmacokinetics (PK) and pharmacodynamics (PD) of various drug are also under study for Colon cancer patients. It is remarkable that a lack of routine exercise or activity is supplementary evident for GIT cancer than any other cancer combined. Obesity has been reported

\*Corresponding author: E-mail: [drfahmidabalouch@gmail.com](mailto:drfahmidabalouch@gmail.com), [drfahmida24@gmail.com](mailto:drfahmida24@gmail.com);

to be associated with increased risk of colorectal cancer, and closely associated with the level of physical activity in this study the effect of sociodemographic factor on biochemical aspects of Cancer is further analyzed. Aim of this study is to determine the awareness and perception of Colorectal cancer in Saudi Arabia and to find out the dietary habits and use of fiber diet among them in order to identify the subpopulation that can be recipients of awareness and screening programs. About 317 subjects was selected after taking written consent on a detailed prescribed questionnaire. Sociodemographic data and information about dietary habits was collected along with biophysical data. All information and the obtained results were analyzed by using SPSS 23. Results: Most of the respondents (51% and 71.9%) knew what is colon and its function. About 11.7%, 62.1% and 22.1% respectively answer high, moderate and low incidence of CRC in Saudi Arabia while 66.9% knew that bowel cancer is 90% curable if detected early. 42% respondent showed that there is an association between IBD and CRC and 75% know the correct time of screening for CRC. Very few respondents know the correct symptoms, risks factors, and screening modalities of Colorectal cancer. Mass media and books are most common method to know about colorectal cancer.

**Conclusions:** Most of the respondent have enough knowledge about CRC although Screening awareness and modalities for screening of CRC need to be further acknowledged. Although they have enough awareness about CRC still most of the study population showed unhealthy life style and few of them use fiber diets and Vegetables and fruits as daily ingredient.

*Keywords: BMI; awareness; colorectal cancer; fiber diet.*

## 1. INTRODUCTION

Introduction World wide, Colorectal cancer's mortality and incidence are more increasing rapidly [1]. The disparity in secular trends may be due to effect of various Sociodemographic factors on colon Cancer development [2]. In general, Sociodemographic factors are assumed to be responsible for up to 65% of the GIT disease's as well as dietary habits in 40% of cases though there several discrepancies regarding the impact of particular food substances are still need to be addressed [3,4]. Among the alimentary minerals, Iron, Magnesium, high Methionine and calcium intake have shown preventive role in development of colon Cancer [5,6]. Relationship between tea consumption and risk of colon cancers was studied in Iowa in United States and establish to be null association [7]. Studies has reported that progression of cancer can be prevented in about 47% of cases of colorectal cancer by a healthy lifestyle [8]. Some studies reported protective role of dietary fiber intake as one of the risk factor for colon cancer [8,9]. Due to the increased mortality, [10] it is essential to recognize effective preventive procedures, especially those of a healthy lifestyle, such as removal of junk food and excessive meat from diet since childhood. Of the dietary factors possibly linked with colorectal cancer, fat intake especially high intake of saturated fat and Polyunsaturated lipids (PUFA) has another debatable concerned [8,9]. However, high intake

of PUFA has been implicated as relevant risk factor for almost all of large bowl cancers including colorectal cancer, whereas a subsequent case-control study based on effect of western diet and High BMI in a revised questionnaire unproductive to find any link between n-3 PUFA intake with Cancer progression [10]. Most of the of all cases and mortality is due to adaptable risk factors, such as smoking habits, an high fat diet, sedentary life, and High BMI, and thus potentially preventable [11].

Another meta analysis published in 2004, reported three cohort studies and seven case-control studies addressed the relationship between reduced physical activity and GIT cancer, and only few cross sectional studies suggested a protective association in absence of co morbid [12,13]. Inflammatory bowel diseases (IBD) are known to be responsible for early development and progression of Colon cancer in young individual. Positive Family History of CRC are need early adherence to specific screening programs [14]. To further address the effect of dietary products, Physical activity, BMI, Lipid profile we want to conduct the Advance research and cross sectional study to compare the Life style modification, dietary consumption of Healthy food factors relevant sociodemographic factors effects between small and large bowl cancers in the case control epidemiologic research in Hail Saudi Arabia.

In Saudi Arabia, Nasser Alsanani in his study on Colorectal Cancer incidence and survival rates (for the period 1994-2010) has shown that it is one of the commonest malignancy in Saudi males and third most common malignancy among Female in Saudi Arabia and world wide. In his study overall 5-year survival in Saudi Arabia was 44.6% for the period 1994-2004 as describes by Nasser Alsanani, et al. [15] in their study in year 2015. Another study by a researcher about Survival Data for Colorectal Cancer describe that it is second most common cancer among Saudis next to Breast cancer [16]. In another meta analysis correlation coefficients were Analyze for per capita consumption patterns of different foods (including rice, egg, cereals, Pulses, beef, poultry products, Sea food, freshwater fish and leafy vegetables) and colorectal cancer incidence data of the recent year or 10 years later [17]. Higher meat diet were considerably and positively correlated with cancers of the prostate in male and Breast cancer in females [18]. Some studies reported that dietary increase intake of calcium as well as insoluble fiber have Protective role in colon cancer progression while in same case-control study, it is found that a higher intake of lipid and processed meat was linked with a compact risk of GIT cancer. Use of Polysaccharide and saturated fatty acids was interconnected to the risk of GIT cancer, particularly in female, while obesity was inversely correlated with the risk of colorectal malignancy in male [19]. Demographically in Asian countries less consumption of processed red meat and good physical activity as compare to people of the United States may be a reason for the lower incidence of cancer in Arab countries. Modification of dietary factors and PA have many beneficial effects like lower rate of disease recurrence and slower progression of advance CRC cancers. Physical activity (PA) has good impact on survival rate of breast cancer in female, prostate cancer in male and in colon cancer for both gender. Studies shown that there is inversely relation of PA with a liver and Colon cancers [20]. Additionally, some evidence suggests that 40% improve survival, particularly in breast and colon cancers [21]. The unknown mechanisms of action by PA effects on various malignancy but may be suggestive to changes in insulin resistance and leptin receptor up regulation. Increased healthy activity has potential role in hormonal regulation and improve body basal metabolic rate [19]. Physical functioning and basal metabolic rate is also improved by isometrics as shown by Some researcher. Further research, are required

because the differences in risk for the consumption of red meat and physical activity between proximal colon and distal colon cancers have not been fully supported by previous studies. In some Prospective studies use of antioxidant like vitamin C intake has been related to potentially reduction of risk of colorectal malignancy [21]. The international variation in the GIT Cancers ratio may comparatively be explained by changes of dietary habits and life style changes internationally. In Middle east countries, however, only a small number of studies concluded that calcium intake reduce the risk of CRC cancer [22]. It is therefore not clear whether the recent trend in high incidence of colorectal cancer in Saudi Arabia is ascribable to changes in life style. Further data and advance search is needed to know why the proportion of large bowel malignancy in all GIT cancer cases is comparatively diverge in People of low physical activity and high BMI. Aim of this study was to assess and identify the level of knowledge and awareness of colorectal cancer with regards to risk factors, symptoms and screening procedures among general public in the Hail region Saudi Arabia Study will have significant implication in preventing from developing end stage cancers and help them in life style modification leading to healthy life. Our study will contribute to healthier nutritional recommendations and guidance for healthy life style interventions.

## 2. MATERIALS AND METHODS

A well-structured questionnaire was prepared and distributed online using different tools including WhatsApp and electronic mails. A detailed questionnaire consisting of information on demographic and other variables was designed. Total 317 questionnaires were mailed in English and Arabic, both languages, to participants before taking consent from each participant.

### 2.1 Study Subjects

The study included 317 participants of various ages, gender, marital status, students and professionals. Similarly, Saudi and non-Saudis residents and almost all of them are living in Saudi Arabia, were included in the study.

### 2.2 Socio-Demographic

The socio-demographics data were regarding nationality, whether the contributor or respondent

are living in house or apartment is in KSA, femininity, oldness, marital status, Having children's or not, educational level, and occupation.

### 2.3 Survey-Procedures

The participants were reached by allocating the questionnaire by posting it on twitter and receiving it by electronic emails. The 317 responses has been collected between July and October 2020. Study Information and its aims and objective was included at the beginning of the online questionnaire and the respondent were informed that by filling this questionnaire they agree to take part in this study and by their consent the results will be used only for scientific and research purposes.

The study included Saudi participants and non-Saudi of different socioeconomic status, gender, educational levels, and occupations. All participants over this period were taking part to fill the questionnaire and responses has been received including 52 on day one, 92 on day two, 16 on day three and total 317 responses in three month duration.

The study questionnaire covered socio-demographic data; question about their dietary habits and other habits like fiber diet and exercise; frequency of Exercise.

### 2.4 Statistical Analysis

The results are presented in frequencies and percentages. The  $p$ -value $<0.05$  was considered significant. All the analysis was carried out on SPSS 23.0 version (Chicago, Inc., USA) [17].

## 3. RESULTS

Majority of participants (58.7%) were aged between 18 to 35, (39.2%) were between 36-60, and (2.2%) were 60 and above. The majority of the participants are Saudi (98%),while the remaining are non-Saudi(69.1%) of Responses from females more than males (69.1% and 30.9%) respectively. More than half of participants were married (56.5%) and the remaining were single (43.5%). More than three quarters of the sample, (89.6%) from Hail while the remaining (3.2%) from Riyadh (5.7%) from Eastern Borders, (0.9%) from Madinah and (0.6%) from Tabuk. The majority of participants, (87.7%) with high education level (college

degree), (10.4%) with high school level, and the remaining (1.9%) with less than high school level (primary and secondary level).

About occupation of participants the majority (39.7%) were students, (30.6%) teacher, (10.1%) housewife, (2.2%) technicians, (6.6%) unemployed, and the remaining (10.7%) with other occupation.

Majority of participants (90.2%) had no relatives or friends with CRC and the remaining (9.8%) had relatives or friends suffer from CRC as shown in Table 1.

Table 2 shows awareness about colon function and its relation various factors. About half of the participants were aware that the colon is the large intestine (53%),and (18.93%) didn't know the answer, while (28.07%) of them chose the wrong answers as: (17.98%) chose stomach and small intestine, (6.31%) chose the small intestine, (3.79%) chose the stomach. The participants were asked about the colon function and (37.85%) of them chose waste storage, (16.40%) chose water reabsorption (15.77%) chose digestion of food (2.84%) chose don't have function ,(27.13%) didn't know the answer. The participants were asked about the incidence of the colorectal cancer (CRC) and majority of them (62.15%) chose middle, while (26.18%) chose rare, and only (11.67%) chose high.

The participants were asked when to start the CRC screening and the majority (75.08%) chose at onset of symptoms, and (17.03%) chose at the age of 40, and (7.89%) chose at the age of 50. The majority of respondents (45.1%) didn't know if there's a relation between colon cancer and Inflammatory bowel disease or not, (42%) of the respondents were aware of that,(12.9%) they said there's no relation. Most of the respondents (66.9%) were awarded that bowel cancer is 90 percent curable if detected early, (33.12%) of the respondents answer were unaware about it.

Table 3 shows dietary, use of fiber diet and exercise habits of Participants. Most of the respondents (60.6%) did not know their current BMI, 14.8% of the respondents were less than 25 kg/m<sup>2</sup>, 12.6% were between 25-30 kg/m<sup>2</sup> and 12.0% of the respondents have their BMI greater than 30 kg/m<sup>2</sup>. Some of the respondents (39.4%) said they rarely take fruits and Vegetable, (32.2%) said two days in a week, (28.4%) they

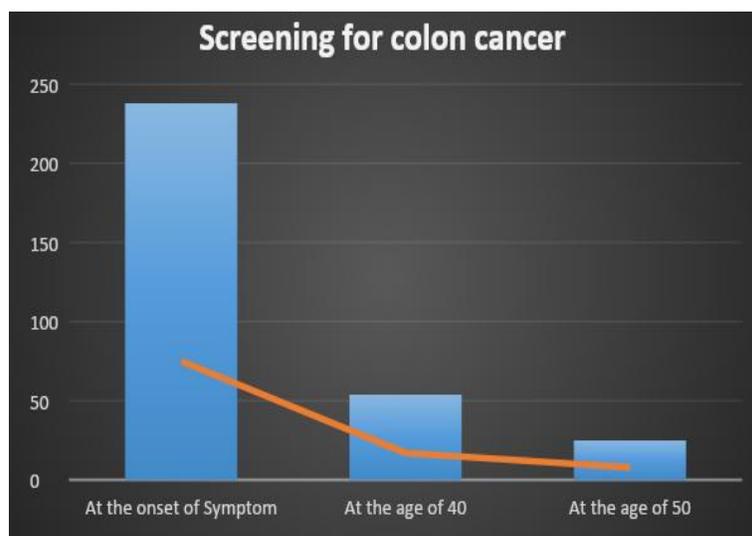
take it daily. The majority of the respondents (70.3%) said no, they did not take balance diet, (29.7%) said yes. Approximately more than half of the respondents (56.2%) said no, they didn't have a daily exercise habit, (23.3%) they were exercising or walk for 15 -20 min, (20.5%) said yes, they have. The majority of the respondents

(82.3%) said yes, they had fiber diet, (17.7%) said no, they didn't have habits of fiber diet.

The majority of the respondents (42.6%) chose at the age of 30, (39.4%) chose at the age of 40, (16.4%) chose at the age of 50 and (1.6%) at the age of 60 as shown in Fig. 1.

**Table 1. Basic profile of respondents**

Demographic profile	No. (n=317)	Percentage %
<b>Age in years</b>		
Less than 18	48	13.3
18 – 29	200	55.2
30 -40	79	21.8
41 – 50	29	8.0
51 – 60	6	1.7
<b>Gender</b>		
Male	148	40.9
Female	214	59.1
<b>Education</b>		
Primary	2	0.6
Secondary	4	1.3
High school	33	10.4
College degree	278	87.7
<b>Occupation</b>		
Student	126	39.7
Teacher	97	30.6
Technicians	7	2.2
House wife	32	10.1
Unemployed	21	6.6
Other	34	10.7
<b>Nationality</b>		
Saudi	311	98.1
Non Saudi	06	1.9



**Fig. 1. Showing response for screening for colon cancer should begin**

**Table 2. Response about awareness and perception regarding colorectal cancer**

Questions About Colorectal Cancer	Responses /Answers	No. (n=317)	%
What's the colon?	The large intestine	168	53.0
	The small intestine	20	6.3
	The stomach	12	3.8
	Stomach and small intestine	57	18.0
	I don't know	60	18.9
What's colon function?	Digestion of food	50	15.8
	Waste storage	120	37.9
	Water reabsorption	52	16.4
	Does not have function	9	2.8
	I don't know	86	27.1
What the incidence of colon cancer?	High	37	11.7
	Middle	197	62.1
	Rare	83	26.2
When start the Screen For Colorectal Cancer ?	At the onset of Symptom	238	75.1
	At the age of 40	54	17.0
	At the age of 50	25	7.9
Is there a relationship between colon cancer and irritable bowel syndrome?	Yes	133	42.0
	No	41	12.9
	I don't no	143	45.1
Are you aware that bowel cancer is 90 per cent curable if detected early?	No	105	33.1
	Yes	212	66.9
Did any of your friends or relatives suffer from Conlon cancer?	No	286	90.2
	Yes	31	9.8

**Table 3. Response about dietary habits and exercise or walk**

Questions	Responses /Answers	No. (n=317)	%
Do you know your BMI it is?	Greater than 30	38	12.0
	25-30	40	12.6
	Less than 25	47	14.8
	I don't know	192	60.6
About your dietary habits How often you take fruits and Vegetable ?	Daily	90	28.4
	Two days in a week	102	32.2
	Rarely	125	39.4
Did you use to have balanced healthy Diet ?	No	223	70.3
	Yes	94	29.7
Do you have daily exercise habit?	Exercise for more than 30 min =Yes	65	20.5
	No / exercise or walk	178	56.2
	Exercise or walk for 15 -20 min	74	23.3
Do you have fiber Diet?	No	56	17.7
	yes	261	82.3

Table 4 showing that the participants were asked about their primary source for knowing about the CRC, and most of the answers were: (54.57%) social media, (43.22%) media. the least sources were (21.14%) books, (10.41%) school, (10.09%) friends and (3.470%) parents. (22.08%) of participants chose other sources.

About half of the participants (47.95%) chose irritable bowel disease as a risk factor for CRC,

and (36.28%) chose family history, (29.65%) chose smoking and (29.02%) chose polyps, and (30.91%) do not know what the risk factors are for the CRC as shown in Fig. 4.

Most of the answers about CRC symptoms were: (50.79%) abdominal pain, (46.06) bloody stool, (40.06%) change in bowel habits, (33.44%) nausea and vomiting, only (12.62%) chose yellow discoloration of skin and eyes, and

(0.631%) chose no symptoms, and (38.8%) chose I don't know Fig. 2.

The participants were asked about the screening tools for CRC and the majority (67.51%) chose colonoscopy, while (30.28%) chose FOB, and (28.08%) chose CT scan, (15.14%) chose ultrasound and (14.2%) chose x ray, and (23.03%) chose I don't know Fig. 3.

#### 4. DISCUSSION

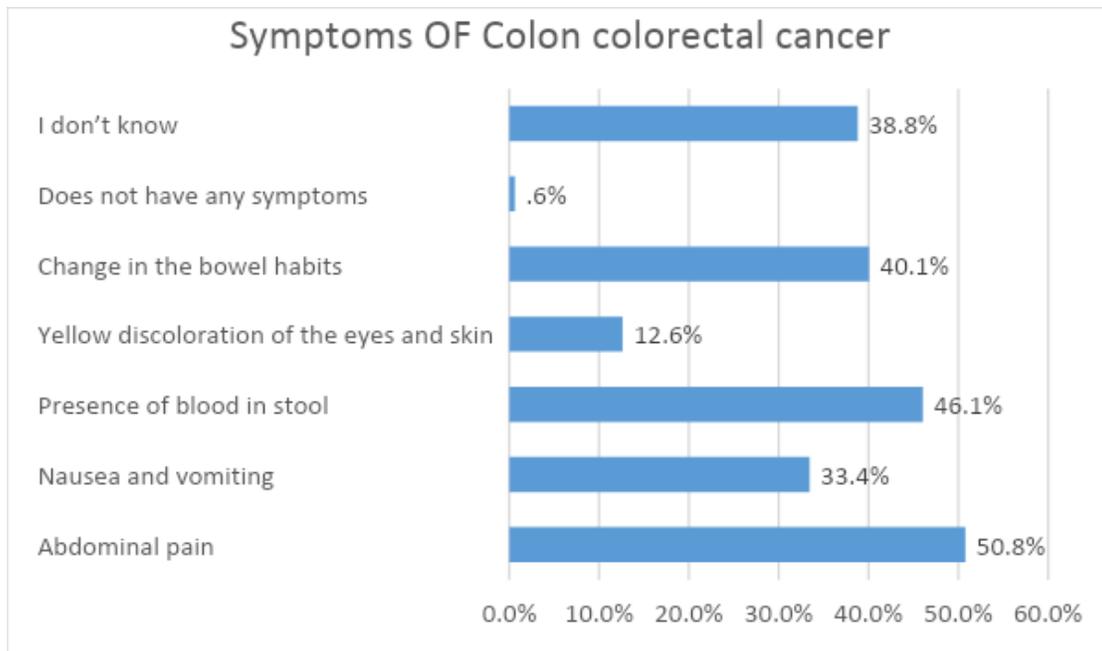
The most of the responses come from female and university educated. We found Female groups more responsive in research as shown in

some studies in UK. Female and those over 60 years old report more common to participate in health researches as D.C. Glass et al. have describe in their study in 2015 [23] but in our research the age group was more responded was 18-25 also in other research in Riyadh same age group was more responses .

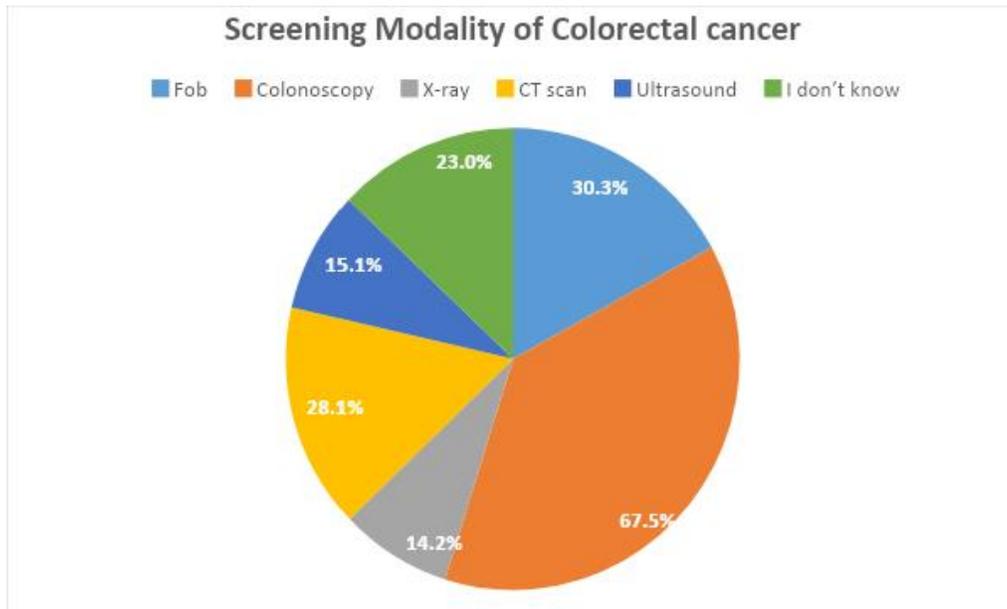
We asked about if their family or friends suffer from CRC and just 9% says yes, While, research in UK the responses was 77% had family or friends with bowel problem. This might be explained by the fact that the Hail is small city also the responses is little compared in this region [24].

**Table 4. Showing primary source of knowledge about colorectal cancer (multiple response)**

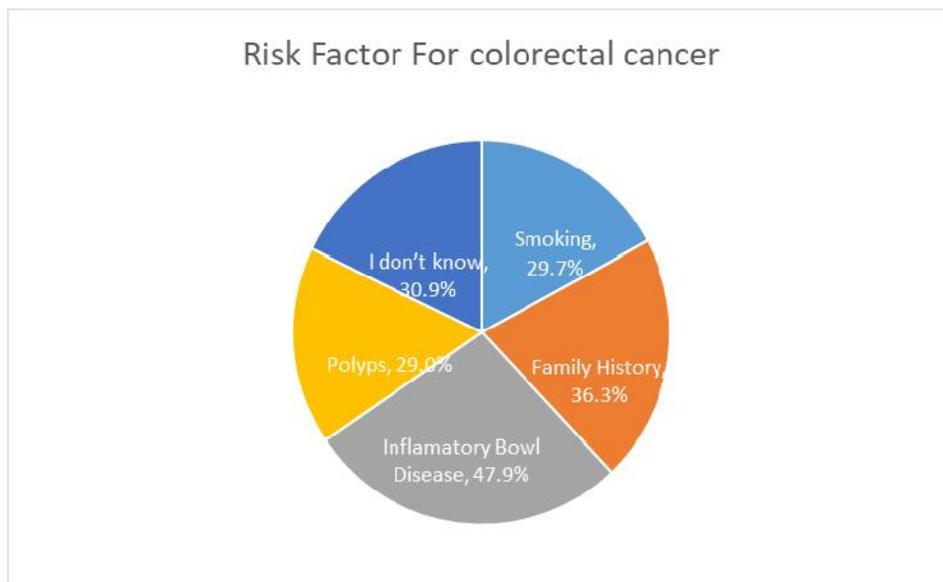
Questions	Responses /Answers	No (n=317)	Percentage %
What is your primary source for knowing about Colorectal Cancer?	School/ Institute	33	6.3%
	Media	137	26.2%
	Books	67	12.8%
	Friends	32	6.1%
	Parents	11	2.1%
	Social media	173	33.1%
	Other	70	13.4%



**Fig. 2. Distribution of respondents response for symptoms of colorectal cancer (Multiple response)**



**Fig. 3. Showing responses about screening methods for colorectal cancer**



**Fig. 4. Showing responses about risk factors of colorectal cancer (multiple answers)**

About the symptoms of CRC most answers were abdominal pain and changes in bowel habit and just 0.3% says that don't have any symptoms. compare with research in Riyadh, most people knew that abdominal pain is a symptom of CRC, but not blood in the stool, change in bowel habits, or that CRC can be asymptomatic , in other research in the Asia-Pacific region the most responses were blood in stool (45.1%) , in our research blood in stool were (20.7%).

Respondent (33.1%) consider the social media is a primary source for knowledge and this indicate the great effect of social media.

Majority of responses they know what is the colon and 18% they don't know, also in research in Riyadh most survey respondents were knowledgeable about colon [25].

About half of the participants chose waste storage and water reabsorption as the functions of the colon, while the remaining half chose the wrong answer or don't know.

The three main risk factors for developing CRC include a family history of CRC, inflammatory bowel disease, and polyps. In our survey, most of the respondents (47.95%) believes that irritable bowel disease is a risk factor of CRC, only (36.28%) for family history, while less than 30% believes that polyps are risk factor. Similarly, in research in Riyadh, less than 20% of all respondents believe that polyps are a risk factor for CRC. Another Study by Norat T et al. [10] in 2007 suggested that daily Consumption of vegetables and fiber have crucial role in the prevention of dysplasia The relationship between dietary meat intake and GIT Diseases leading to colon cancer (CRC) risk remains controversial.

Most of respondents were unaware of the relation between CRC and IBD (58.04%). Majority of respondents were unaware how common CRC is, as only (11.67%) believe CRC is highly common. In other research in UK, The majority of respondents (62%) were also unaware how common CRC is in this region.

About the screening for CRC, most of the answers to when screening should commence was at symptom onset (75.08%), while only (7.89%) believe it should be done at age of 50. In another study in Riyadh, the most common answer was also at symptoms onset (42.9%) and only a quarter chose at age of 50.

It was found that participant's knowledge was the highest regarding using colonoscopy as screening modality for CRC, followed by FOBt. In research in UK 45% were unaware that CRC is one of the easiest cancers to cure if caught early In our study, 33.1% had just been unaware about CRC [26].

In our study, 42.6% they were chose 30 is the age of screening for CRC. In another study in Kuwait (47%) identified age of over 40 years [27]. In our study, 60.6% they didn't know about their BMI.

In our study, 56.2% were not having a daily exercise habits that mean they don't know that a risk factor for CRC, also In another study, in the UK only 30% knew that lack of exercise was a risk factor [23]. Somatic activity recommendations for elderly include engaging in regular walk at least 20 minutes , avoiding dietary fat or

sedentary life style , returning to routine daily home activities as soon as possible following diagnosis, aiming to exercise at least 150 min/week, and including strength training physiotherapy for at least 3 days/week unless any Comorbid with contraindication [28].

In our study, 70.3% hadn't balanced, healthy diet also 28.4% only take fruits and vegetables daily and that mean they don't know that's a risk factor for CRC, In another study, in the UK 70% were aware of dietary factors [29,30] .

In our research, 82.3% had a fiber diet, in other research in the UK around 80% were awarded that the fiber diet is protective against CRC cancer [27].

## 5. CONCLUSION

Single less educated individuals were lack knowledge of CRC. In addition, there is enough awareness of CRC symptoms and risk factors of CRC among study group, and less knowledge about screening modalities and when should to start screen test among the entire surveyed population. Although general population have enough awareness about CRC still most of the respondent showed unhealthy life style and less frequently use fiber diets and exercise habits. ( $p < 0.05$ ).

## CONSENT

As per international standard or university standard, Participants' written consent has been collected and preserved by the author(s).

## ETHICAL APPROVAL

The institutional ethical committee, University Of hail, approved the study.

## COMPETING INTERESTS

Authors have declared that no competing interests exist.

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