



COLORECTAL CANCER AWARENESS AMONG PUBLIC POPULATION IN EASTERN PROVINCE, SAUDI ARABIA

Surgery

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ABSTRACT

Introduction: Colorectal cancer is the second most spread cancer in females and the third in males worldwide [1]. In Saudi Arabia, it was reported in 2014, that new colorectal cancer patients are 11.5% of the total cancer patients; making it the second most common cancer among Saudis [2]. According to multiple studies done in Saudi Arabia, the public awareness of colorectal cancer diagnosis and prevention is low, with varying levels from region to another, and from age group to another [3,4].

Aim: The goal of this study is to identify the level of awareness of colorectal cancer among public population in the Eastern Province of Saudi Arabia.

Methodology: This study is a "Cross Sectional Study" based on a questionnaire done through Google's Survey, distributed via social media. The questionnaire consisted of 20 questions (7 personal and 13 specified to knowledge of colorectal cancer). The study population was 963 participants out of the general population of Saudi Arabia Eastern Province.

Results, Conclusion and Recommendations: Only 19.4% of the participants think that colorectal cancer is widespread in Saudi Arabia. Of the participants, only 7.4% knew the correct risk factors of this cancer, only 8.3% knew the screening tests, while 87.94% thought that colon cancer is avoidable. In conclusion, the population of Saudi Arabia Eastern Province need annual campaigns for education about colorectal cancer. Therefore, the population of Eastern Province, Saudi Arabia is in need for educational campaigns about colorectal cancer.

KEYWORDS

Colorectal Cancer, Awareness, Knowledge, Saudi Arabia, Symptoms, Screening

Introduction

Colorectal cancer (CRC) is the second most spread cancer in females and the third in males worldwide [1].

In the United states of America, CRC is the third most common malignancy and the second leading cause of cancer related death in males and the third in females [5,6].

There is a significant variation in colorectal cancer incidence from region to another with the lowest rates reported in Asia, Africa and South America, and the highest rates reported in Australia/NewZeland [7,8].

It is a multifactorial disease. Genetic factors, environmental exposure (including diet), inflammatory condition of digestive tract is all involved in the development of CRC, also age, sexual and racial

related disparities in incidence. Colorectal cancer incidence rates have been higher for blacks than for whites in both men and women [7].

In Saudi Arabia, it was reported in 2013, that Colorectal cancer patients are 11.5% of the total cancer patients; making it the second most common cancer among Saudis. It is the most common cancer among Saudi males, with 14.2%, while it is the third most common cancer among females, with 9.3% [2].

According to multiple studies done in Saudi Arabia, the public awareness of colorectal cancer diagnosis and prevention is low, with varying levels from region to another, and from age group to another.

One of these studies was done in Riyadh, Saudi Arabia in March/2015 among the public population it concluded that the individuals with higher education level tended to answer the questions correctly, there

were some misconceptions regarding universally accepted screening protocols, symptoms, and general understanding of CRC in Saudi Arabia. The study recommended for nationwide educational and screening programs to improve the awareness [3].

Another study done in AlAhasa in April/2016 among older Saudis attending PHC centers it found poor levels of knowledge of risk factors and early signs of colorectal cancer, and perceived barriers to screening, and also this study recommended for educational and screening programs to improve the awareness of colorectal cancer [4]. Although there are multiple studies done in different regions of Saudi Arabia and although of the high incidence and magnitude of colorectal cancer, there is no recent study specifying the level of knowledge about colorectal cancer among the general population of Eastern province including (Dammam, Khobar, and Qatif) and with low educational campaigns and programs about colorectal cancer arises the importance of this study.

Methodology (Materials and Methods)

Study Area/Time

This study was conducted on the general population of Eastern Province Saudi Arabia (Dammam, Khobar, and Qatif cities and regions following them), collecting data started on May/2017 and lasted for 1 week.

Study Subjects

General population of Eastern Province Saudi Arabia. The choice of Eastern Province is due to the lack of previous studies determining the level of awareness in this region.

Study Design

An analytic cross-sectional study done through a standard format questionnaire on google survey's and distributed via social media (WhatsApp, Facebook, Instagram and twitter) to asses knowledge and awareness of colorectal cancer diagnosis and prevention (e.g., risk factors, symptoms, screening test) among the public population of Eastern Province, Saudi Arabia.

Data Collection Methods and Study Tool

The questionnaire, consent forms, and information part detailing the purpose of the study and how to complete the survey were developed in the Arabic language following a standard format [9,10], published through Google's Surveys and then distributed through Social Media (WhatsApp, Facebook, Instagram and twitter) by 12 physicians, and a contact email and phone numbers were provided for any queries from the participants.

However, to be included in the analysis, only questionnaires submitted by people from Eastern Province, Saudi Arabia were accepted.

The survey consisted of 20 questions divided into 2 parts first part (7 questions related to personal information), and the second part (12 questions specified to knowledge of colorectal cancer), all questions were in multiple choice format, and multiple answers per question were permitted where appropriate (Table1). Anonymous personal data (age, gender, marital status, and education level) were also collected.

1st Part: Personal Information:	
1. Sex	<input type="radio"/> Male <input type="radio"/> Female
2. Nationality	<input type="radio"/> Saudi <input type="radio"/> Non-Saudi
3. Residence	<input type="radio"/> Eastern Province <input type="radio"/> Other
4. Age	<input type="radio"/> 20-24 <input type="radio"/> 25-29 <input type="radio"/> 30-34 <input type="radio"/> 35-39 <input type="radio"/> 40-44 <input type="radio"/> 45-49 <input type="radio"/> 50-54 <input type="radio"/> 55-59 <input type="radio"/> >=60 <input type="radio"/> <=19

5. Social status	<input type="radio"/> Single <input type="radio"/> Married <input type="radio"/> Widowed <input type="radio"/> Divorced
6. Educational level	<input type="radio"/> Illiterate <input type="radio"/> Read & write <input type="radio"/> Primary <input type="radio"/> Secondary <input type="radio"/> University <input type="radio"/> Postgraduate <input type="radio"/> Other
7. Job	<input type="radio"/> Medical <input type="radio"/> Non-medical
2nd Part: Colorectal Cancer Knowledge	
8. Colon	<input type="radio"/> Small bowel <input type="radio"/> Large bowel <input type="radio"/> Stomach <input type="radio"/> Stomach and large bowel
9. Rectum	<input type="radio"/> Last part of the stomach <input type="radio"/> Last part of the small bowel <input type="radio"/> Last part of the large bowel
10. Hearing	<input type="radio"/> Yes <input type="radio"/> No
11. Avoidance	<input type="radio"/> Yes <input type="radio"/> No
12. Family History	<input type="radio"/> Yes <input type="radio"/> No
13. Disease Prevalence	<input type="radio"/> Common <input type="radio"/> Average <input type="radio"/> Rare
14. Best Time for Screening	<input type="radio"/> Appearance of the symptoms <input type="radio"/> At age of 20 <input type="radio"/> At age of 50 <input type="radio"/> At age of 70
15. Symptoms "You can choose more than choice"	<input type="radio"/> Abdominal pain <input type="radio"/> Alternate bowel habit <input type="radio"/> Nausea and vomiting <input type="radio"/> Yellowish discoloration of the skin and eye <input type="radio"/> Blood with stool <input type="radio"/> Had no symptoms
16. Risk factors "You can choose more than choice"	<input type="radio"/> Smoking <input type="radio"/> Ulcerative colitis <input type="radio"/> Family history <input type="radio"/> High fatty foods <input type="radio"/> Colon polyps
17. Screening Tests "You can choose more than choice"	<input type="radio"/> Stool analysis <input type="radio"/> X-rays <input type="radio"/> Colonoscopy <input type="radio"/> Contrast radiography <input type="radio"/> Ultrasonography
18. Treatable or Not	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> I don't know
19. Relation to IBS	<input type="radio"/> Yes <input type="radio"/> No <input type="radio"/> I don't know

Data Managements and Analysis Plan

On 15 May 2017, the submission of new surveys by the public was stopped and the submitted questioners were collected and prepared for analysis. Any submission done by a person outside of Eastern Province, Saudi Arabia were excluded.

Data was entered into a personal computer and it was analyzed using (IBM, SPSS) software version 16. All variables were coded before entry and were checked before analysis. To simplify the analysis, even though a respondent could select multiple options for questions related to symptoms and risk factors, all options were evaluated individually.

A P value of <0.05 was considered statistically significant For analysis, Age was divided into groups as follows: <19 years of age, 20-24 years, 25-29 years, 30-34 years, 35-39 years, 40-44 years, 45-49

years, 50-54 years, 55-59 years, and 60+ years of age. Gender and marital status were also analyzed. Also, education level was grouped as follows: Illiterate and primary school; intermediate school; secondary school; university; post-graduate school and others. Job was also added with whether the participant is related to medicine or not.

Results

In total, 963 participants completed the survey. Demographic characteristics of the participants, including age, nationality, gender, marital status, level of education and relation of their profession to the medical field are presented in (Table2).

Most of the participants were citizens of Saudi Arabia 958 (99.4%) while only 6 are noncitizens of Saudi Arabia. The majority are married 723 (75.1%), males 618 (64.2%), aged 30-39 years 262 (27.2%) that had post-secondary education 613 (63.7%) and their profession is non-medical 837 (86.9%).

The majority of the participants were fairly aware of the anatomy of the colon with 606 (62.9%) that answered correctly and 721 (748%) who answered that the rectum is the last part of the large bowel.

803 people (83.4%) have previously heard of colorectal cancer, 846 (87.9%) think that colorectal cancer is avoidable and only 83 (8.6%) have someone in their family diagnosed with colorectal cancer.

Table2. Demographic of the Participants

963 Participants		
618 Males (64.2%)	345 Females (35.8%)	
Nationality		
Saudi	957	99.4%
Non-Saudi	6	0.6%
Age		
<=19 Years	58	6.0%
20-29 Years	256	26.5%
30-39 Years	262	27.2%
40-44 Years	219	22.7%
50-59 Years	129	13.4%
>=60 Years	39	4.0%
Level of Education		
Illiterate/Primary	5	0.5%
Intermediate	52	5.4%
Secondary	209	21.7%
University	613	63.7%
Postgraduate	58	6.0%
Other	26	2.7%
Social status		
Single	223	23.2%
Married	723	75.1%
Widowed	7	0.7%
Divorced	10	1.0%
Job or Occupation		
Medical	126	13.1%
Non-Medical	837	86.9%

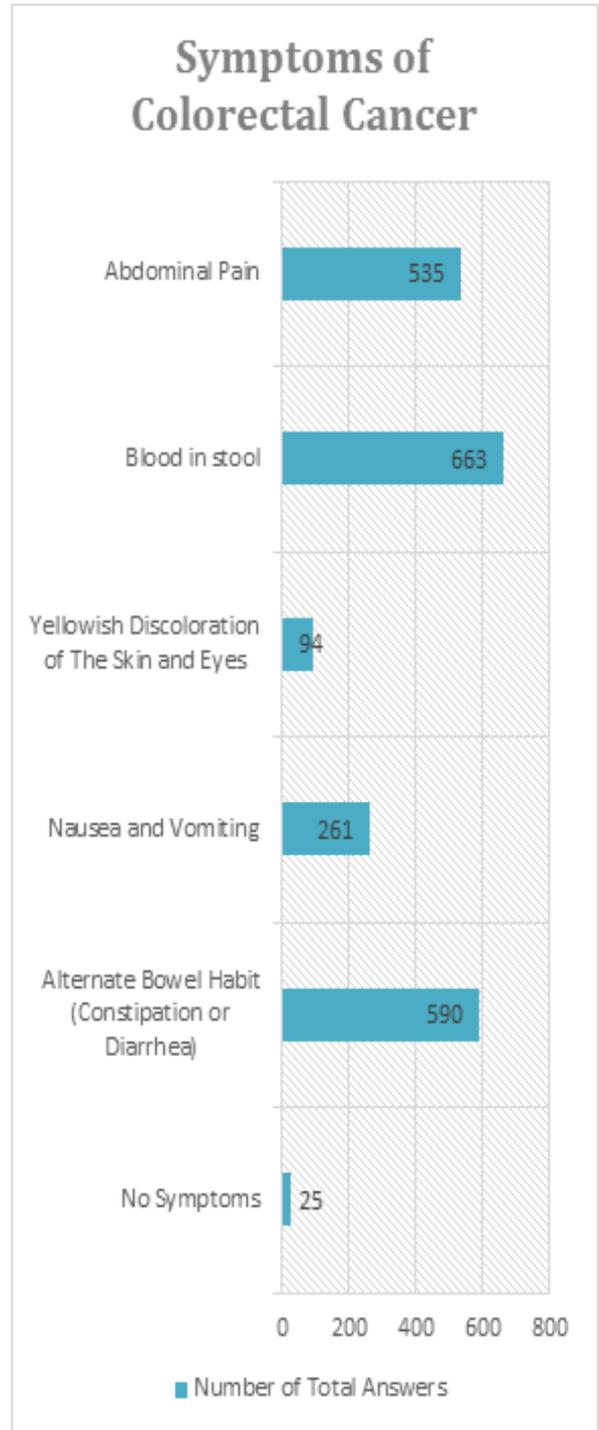
Regarding the spread of colorectal cancer only 187 (19.4%) think that colorectal cancer is common, the majority 538 (55.9%) think it is average, also those from the medical field think that is colorectal cancer is average 59 out of 126.

Most of the participants believe that screening should be started with the appearance of symptoms 498 (51.7%) while 335 (34.8%) think it should start at age 50.

When it comes to the symptoms of colorectal cancer the most chosen symptom was Blood in Stool with 663 (68.8%), the most chosen answer was a combination of (alternate bowel habits and blood in stool) with 164 (17.0%), while only 76(7.9%) chose the correct answer (abdominal pain, alternated bowel habit, blood in stool and nausea &

vomiting), also 23 (2.4%) think that colorectal cancer can come with no symptoms (Figure1)(Appendix1).

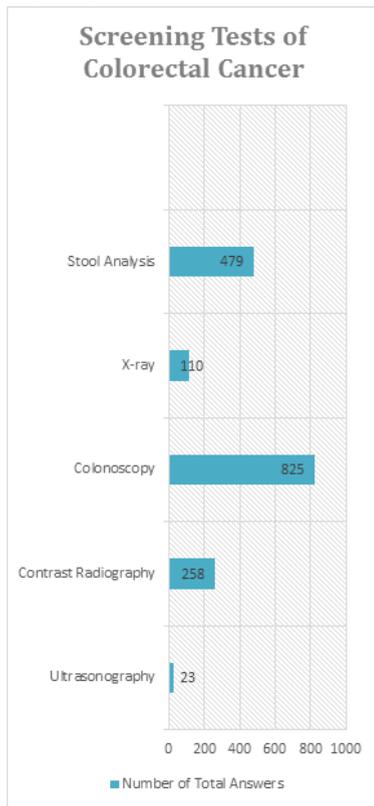
Figure1. Distribution of participants answers to the question “What are the symptoms of colorectal cancer?”



With respect to colorectal cancer screening tests most of the participants chose colonoscopy as the single screening test 290 (30.1%) and it is also the most chosen screening test 825 (85.6%), while only 75 (7.8%) of participants chose correctly (stool analysis, colonoscopy & contrast radiography) and those with medical profession agree with public opinion with most of them choosing colonoscopy alone 34 (27.6%), and only 15 (12.2%) out of the people related to medicine chose the correct answer (Figure2).

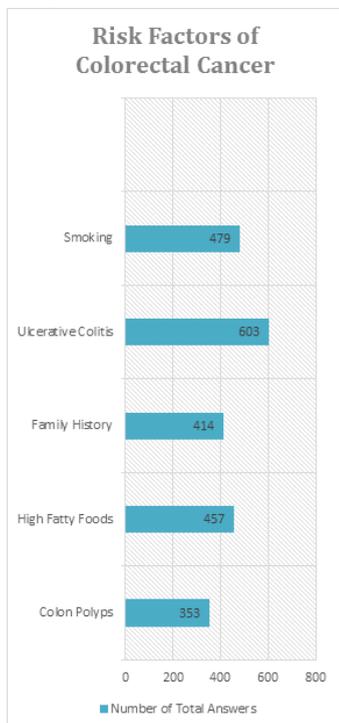
Figure2. Distribution of participants answers to the question “What

are the screening tests of colorectal cancer?"



According to the participants when it comes to colorectal cancer risk factors the majority 603 (62.6%) chose ulcerative colitis as one of the risk factors with 105 (10.9%) of the participants believing that ulcerative colitis is the only risk factor. Only 63 (6.5%) chose the correct answer (smoking, ulcerative colitis, family history, high fatty foods and colon polyps) (Figure3).

Figure3. Distribution of participants answers to the question "What are the risk factors of colorectal cancer?"



691 (71.8%) participants believe that colorectal cancer is treatable

while 37 (3.8%) disagree and 235 (24.4%) had no knowledge. With respect to Irritable Bowel Syndrome (IBS) the majority 420 (43.6%) didn't know if there is a relation between colorectal cancer and IBS, while 320 (33.2%) answered yes there is a relation and 223 (23.2%) no relation between colorectal cancer and IBS.

Discussion, Conclusion & Recommendation

This study was an attempt to measure the level of awareness of colorectal cancer among the public of Eastern Province, Saudi Arabia. The knowledge in question is of prevalence, risk factors, symptoms and diagnosis of colorectal cancer. Then comparing the findings with other regions of Saudi Arabia and the world, and associating them to different demographic characteristics among the participants.

963 people from Eastern Province, Saudi Arabia have participated, 958 (99.4%) are citizens of Saudi Arabia, most of them are married 723 (75.1%), males 618 (64.2%), aged 30-39 years 262 (27.2%) that had post-secondary education 613 (63.7%) and only 126 (13.1%) had medical profession.

In general, participants were knowledgeable when it came to colon and rectum anatomical location, but the big difference in knowledge came when asked about CRC screening tests, risk factors and symptoms.

In the end, however generally, females, younger, and more educated participants had (statistically significant) more knowledge and awareness of colorectal cancer. Postgraduates and those between the age of 50-59 years answered correctly more frequently than other demographic groups. Moreover, males were more knowledgeable of CRC symptoms and the time for screening which correlate to how that the males at greater risk to develop CRC [11]. Single individuals in this study, on the other hand, were more knowledgeable than married individuals.

Regarding symptoms of CRC, most of who answered correctly were males, 30-39 years, single, post-secondary education and from the medical field. When it came to risk factors, those from the groups males, 20-29 years, single, post-secondary education and from the medical field were most likely to answer correctly. Lastly, the groups who with the most correct answer in regard to screening tests were females, 50-59 years, married, post-secondary education and from the medical field.

Although the present survey indicated a large degree of variable knowledge of colorectal cancer across all groups (with males, older participants with higher education doing significantly better), this is not uncommon from Saudi Arabia perspective. For instance, varying and lacking awareness were found in a study done in Riyadh to measure the public knowledge of CRC [3]. This limited awareness was seen in another study in AlHasa, Saudi Arabia where they detected poor level of awareness of colorectal cancer among elder patients [4]. Also from a global perspective, this lack of knowledge was visible in Ireland, which has spurred the development of a national CRC screening program [12]. Similarly, in the Czech Republic, organized screening was implemented in 2000, and there has been a general trend of earlier CRC detection [13], which should encourage for the organization of screening programs to be implemented for Saudi Arabia.

The study also shows those who are most lacking when it comes to knowledge of CRC, the less educated participants, younger and female, but poor knowledge from all groups in questions like screening time and risk factors, which means that if educational programs would be implemented it should be aimed at all the populations and demographics in Saudi Arabia. Also, this lack of knowledge of colorectal cancer should encourage and promote screening programs in Saudi Arabia.

Many methods to increase colorectal cancer awareness have been proposed, including using health fairs to promote CRC awareness [14], and workplace screening has also been shown to effectively increase CRC awareness [15]. Another option is to organize a CRC campaign month around the country where educational pamphlets, and

screening tests are offered to the public.

This study is not without limitations, like that it was biased toward younger participants due to the use of social media while they have a lesser risk of developing colorectal cancer. However, it is important to measure the knowledge of all age groups, as for instance, younger participants can educate their older family members. Future studies should focus on rural areas as it was not fully covered in our study. The aim of our study was to identify whether people are knowledgeable or lacking when it comes to colorectal cancer in order to target with educational programs, and this was successfully accomplished. Finally, larger surveys encompassing a greater percentage of the population from different regions are necessary to be able to further generalize the results of this study to a larger cohort of the Saudi population.

In conclusion, in eastern Province, Saudi Arabia lack of knowledge and awareness were most visible among the demographic: young, single, female, with low education. However, the public population generally had misconceptions especially when it came to screening time and risk factors of colorectal cancer, and this correlate with findings from different regions of Saudi Arabia and the world. In the end, this should encourage and promote the initiation of educational and screening programs that target all residents of Saudi Arabia.

Appendix1. Participants Response to The Question Symptoms of Colorectal Cancer

Symptom	Frequency	Percent
Abdominal Pain	76	7.9
Alternate bowel Habit	64	6.6
Nausea and vomiting	15	1.6
Jaundice	7	.7
Blood in stool	110	11.4
No symptoms	16	1.7
Alternate bowel habit, nausea and vomiting & blood in stool	30	3.1
alternate bowel habit & blood in stool	102	10.6
abdominal pain, alternate bowel habit & nausea and vomiting	19	2.0
abdominal pain & blood in stool	53	5.5
abdominal pain & alternate bowel habit	54	5.6
abdominal pain, nausea and vomiting & blood in stool	23	2.4
abdominal pain, alternate bowel habit & blood in stool	164	17.0
abdominal pain & nausea and vomiting	14	1.5
abdominal pain, alternate bowel habit, nausea and vomiting & blood in stool	76	7.9
abdominal pain, alternate bowel habit, nausea and vomiting, jaundice & blood in stool	34	3.5
abdominal pain, alternate bowel habit & jaundice	4	.4
alternate bowel habit, jaundice & blood in stool	14	1.5
nausea and vomiting & blood in stool	11	1.1
alternate bowel habit & jaundice	4	.4
abdominal pain, nausea and vomiting, jaundice and blood in stool	8	.8
abdominal pain, nausea and vomiting & jaundice	3	.3
nausea and vomiting, jaundice and blood in stool	5	.5
nausea and vomiting & jaundice	3	.3
abdominal pain, alternate bowel habit, jaundice & blood in stool	16	1.7
abdominal pain, alternate bowel habit, nausea and vomiting, blood in stool and had no symptoms	2	.2
alternate bowel habit) & nausea and vomiting	7	.7

Jaundice & blood in stool	4	.4
abdominal pain & jaundice	6	.6
alternate bowel habit, nausea and vomiting, jaundice & blood in stool	3	.3
abdominal pain, alternate bowel habit, nausea and vomiting, jaundice and had no symptoms	1	.1
abdominal pain, alternate bowel habit, nausea and vomiting & jaundice	5	.5
alternate bowel habit & had no symptoms	1	.1
abdominal pain, alternate bowel habit, blood in stool & had no symptoms	1	.1
abdominal pain, jaundice & blood in stool	4	.4
abdominal pain & had no symptoms	1	.1
abdominal pain, alternate bowel habit, nausea and vomiting, jaundice, blood in stools & had no symptoms	2	.2
alternate bowel habit, blood in stool & had no symptoms	1	.1
Total	963	100.0

Appendix2. Participants Response to The Question Screening Tests of Colorectal Cancer

Screening Test	Frequency	Percent
Stool Analysis	53	5.5
X-ray	19	2.0
Colonoscopy	290	30.1
Contrast Radiography	28	2.9
Ultrasonography	4	.4
Stool Analysis & Colonoscopy	238	24.7
Colonoscopy & Contrast Radiography	84	8.7
Colonoscopy, Contrast Radiography & Ultrasonography	10	1.0
Stool Analysis, Colonoscopy & Contrast Radiography	75	7.8
Stool Analysis & Contrast Radiography	14	1.5
Stool Analysis, X-ray & Colonoscopy	29	3.0
Stool Analysis, Colonoscopy, Contrast Radiography & Ultrasonography	15	1.6
X-ray & Colonoscopy	20	2.1
Stool Analysis, X-ray, Colonoscopy & Contrast Radiography	13	1.3
Stool Analysis, X-ray, Colonoscopy, Contrast Radiography & Ultrasonography	9	.9
Stool Analysis & X-ray	10	1.0
Colonoscopy & Ultrasonography	20	2.1
X-ray, Colonoscopy & Contrast Radiography	4	.4
Stool Analysis, Colonoscopy & Ultrasonography	12	1.2
Stool Analysis, X-ray, Colonoscopy, Ultrasonography	3	.3
X-ray, Colonoscopy, Contrast Radiography & Ultrasonography	3	.3
Stool Analysis & Ultrasonography	7	.7
Contrast Radiography, Ultrasonography	2	.2
Stool Analysis, Contrast Radiography & Ultrasonography	1	.1
Total	963	100.0

Appendix3. Participants Response to The Question Risk Factor of Colorectal Cancer

Risk Factor	Frequency	Percent
Smoking	39	4.0
Ulcerative Colitis	105	10.9
Family History	29	3.0
High Fatty Foods	85	8.8

Colon Polyps	36	3.7
Smoking & Ulcerative Colitis	38	3.9
High Fatty Foods & Colon Polyps	17	1.8
Smoking & High Fatty Foods	29	3.0
Smoking, Ulcerative Colitis, Family History, High Fatty Foods and Colon Polyps	63	6.5
Ulcerative Colitis, Family History & High Fatty Foods	29	3.0
Smoking, Family History & High Fatty Foods	14	1.5
Ulcerative Colitis, Family History & Colon Polyps	52	5.4
Smoking & Colon Polyps	7	.7
Smoking & Family History	22	2.3
Smoking, Ulcerative Colitis, Family History and Colon Polyps	14	1.5
Ulcerative Colitis, High Fatty Foods & Colon Polyps	22	2.3
Smoking, Ulcerative Colitis & High Fatty Foods	33	3.4
Ulcerative Colitis, Family History, High Fatty Foods & Colon Polyps	25	2.6
Smoking, Ulcerative Colitis, Family History & High Fatty Foods	12	1.2
Smoking, Ulcerative Colitis, High Fatty Foods & Colon Polyps	11	1.1
Ulcerative Colitis & High Fatty Foods	61	6.3
Smoking, High Fatty Foods & Colon Polyps	12	1.2
Ulcerative Colitis & Family History	55	5.7
Smoking, Ulcerative Colitis & Family History	29	3.0
Ulcerative Colitis & Colon Polyps	36	3.7
Smoking, Ulcerative Colitis & Colon Polyps	18	1.9
Family History & High Fatty Foods	30	3.1
Family History, High Fatty Foods & Colon Polyps	9	.9
Smoking, Family History & Colon Polyps	12	1.2
Family History & Colon Polyps	14	1.5
Smoking, Family History, High Fatty Foods & Colon Polyps	5	.5
Total	963	100.0

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