



**IRAQI PEOPLE'S KNOWLEDGE, ATTITUDE,
AND PRACTICE TOWARDS COLORECTAL
CANCER, RISK FACTORS AND SCREENING**

**2021
MASTER THESIS
NURSING SCIENCE**

Burhan FAREEQ MOHAMMAD

**Thesis Advisor
Assoc.Prof.Dr. Işıl Işık ANDSOY**

**IRAQI PEOPLE'S KNOWLEDGE, ATTITUDE, AND PRACTICE
TOWARDS COLORECTAL CANCER, RISK FACTORS AND SCREENING**

Burhan FARIQ MOHAMMED

T.C.

Karabük University

Institute of Graduate Programs

Department of Nursing Science

Prepared as

Master Thesis

Thesis Advisor

Assoc.Prof.Dr. Işıl Işık ANDSOY

KARABUK

August 2021

I certify that in my opinion the thesis submitted by Burhan FAREEQ MOHAMMAD titled “IRAQI PEOPLE’S KNOWLEDGE, ATTITUDE, AND PRACTICE TOWARDS COLORECTAL CANCER, RISK FACTORS, AND SCREENING ” is fully adequate in scope and in quality as a thesis for the degree of Master of Science.

Assoc.Prof.Dr. Işıl Işık ANDSOY
Thesis Advisor, Department of Nursing

This thesis is accepted by the examining committee with a unanimous vote in the Department of Nursing as a Master of Science thesis. August 20, 2021

<u>Examining Committee Members (Institutions)</u>	<u>Signature</u>
Chairman : Assist.Prof.Dr.Hale TOSUN (Sağlık Bil. Üni)
Member : Assoc.Prof.Dr. Işıl IŞIK ANDSOY (K.B.U.)
Member : Assist.Prof.Dr. Gülcan KAR ŞEN (K.B.U.)

The degree of Master of Science by the thesis submitted is approved by the Administrative Board of the Institute of Graduate Programs, Karabuk University.

Prof. Dr. Hasan SOLMAZ
Director of the Institute of Graduate Programs

“I declare that all the information within this thesis has been gathered and presented in accordance with academic regulations and ethical principles and I have according to the requirements of these regulations and principles cited all those which do not originate in this work as well.”

Burhan FARIQ MOHAMMED

ABSTRACT

M. Sc. Thesis

IRAQI PEOPLE’S KNOWLEDGE, ATTITUDE, AND PRACTICE TOWARDS COLORECTAL CANCER, RISK FACTORS, AND SCREENING

Burhan FAREEQ MOHAMMAD

**Karabuk University
Institute of Graduate Programs
The Department of Nursing Science**

Thesis Advisor:

Assoc. Prof. Dr. Işıl IŞIK ANDSOY

2021, 63 pages

Colorectal cancer is a one of public health concern, as it continues to be the cause of death around the world. There is a lack of studies to determine Iraqi population’s knowledge, attitude, and practices towards colorectal cancer and risk factors. A descriptive cross-sectional study was conducted to assess knowledge, attitude, and practice of people towards colorectal cancer, risk factors and screening. The study was carried out during the period of 1st February 2020 to the 30th of July 2021. The sample of the study were adult people in Sulaimanyah governorate. The study population included 1361 participants. The questionnaire was self-designed which consist of four parts. Descriptive statistical analysis and multiple regression were used for data analysis. Majority of participants were male (70.8%), married (89.9%), graduated from secondary school (40.0%), many participants did not have any chronic disease (87.6%). Mean score for the participants’ knowledge levels was insufficient ($13.62 \pm$

2.96). It also indicated that there was a significant association between overall knowledge and work status ($p = 0.005$). Results showed that there is lack of knowledge about some CRC risk factor among Iraqi population, these translate to inadequate preventive behavior patterns. There is an apparent need to establish more wide-spread and effective educational interventions to improve the level of understanding of CRC, create healthy behaviors in the Iraqi population.

Key Words : Colorectal cancer, risk factor, screening, knowledge, attitude, practices

Science Code : 1032.08

ÖZET

Yüksek Lisans Tezi

IRAKLI BİREYLERİN KOLOREKTAL KANSER, RİSK FAKTÖRLERİ VE TARAMAYA YÖNELİK BİLGİ, TUTUM VE UYGULAMALARI

BURHAN FAREEQ MOHAMMAD

Karabük Üniversitesi

Lisansüstü Eğitim Enstitüsü

Hemşirelik Bilimi Anabilim Dalı

Tez Danışmanı:

Doç. Dr. Işıl IŞIK ANDSOY

2021, 63 sayfa

Kolorektal kanser, dünya çapında ölüm nedeni olmaya devam etmesi açısından halk sağlığı endişelerinden biridir. Iraklı bireylerin kolorektal kanser ve risk faktörlerine yönelik bilgi, tutum ve uygulamalarını belirlemeye yönelik çalışmalar yetersizdir. Bu nedenle, çalışma Iraklı bireylerin kolorektal kanser, risk faktörleri ve taramaya yönelik bilgi, tutum ve uygulamalarını değerlendirmek amacıyla tanımlayıcı olarak 1 Şubat 2020-30 Temmuz 2021 tarihleri arasında gerçekleştirildi. Araştırmanın örneklemini Süleymaniye ilinde yaşayan 1361 birey oluşturdu. Veriler, dört bölümden oluşan anket formu ile toplandı. Verilerin analizinde tanımlayıcı istatistikler ve regresyon analizi kullanıldı. Katılımcıların çoğunluğu erkek (%70,8), evli (%89,9), ortaokul mezunu (%40,0) idi ve çoğunluğunun herhangi bir kronik hastalığı yoktu (%87,6). Katılımcıların bilgi düzeylerine ilişkin ortalama puanın yetersiz (13.62 ± 2.9) olduğu bulundu. Ayrıca, katılımcıların bilgi puan ortalaması ile çalışma durumu arasında istatistiksel olarak anlamlı ilişki olduğu belirlendi ($p = 0,005$). Sonuçlar, Iraklı

bireylerin CRC risk faktörleri hakkında bilgi eksiklikleri olduğunu gösterdi. Bu doğrultuda, Iraklı bireylerin kolorektal kanserin önemi ve taramaya yönelik sağlıklı davranışlar oluşturmak için etkili eğitim müdahaleleri oluşturma önerilmektedir.

Anahtar Kelimeler : Klorektal kanser, risk faktörü, tarama, bilgi, tutum, uygulamalar

Bilim Kodu : 1032.08

ACKNOWLEDGMENT

First and foremost, I would like to express my deepest gratitude to my supervisor Assoc. Prof. Dr. IŞIL IŞIK ANDSOY, for her guidance, motivation, and continuous support throughout this academic journey of mine. This work would have been an impossible task for me without her mentoring and moral support.

Also, I'd like to express my gratitude to all the teachers who have taught and supported me during my study.

CONTENTS

	<u>Page</u>
APPROVAL.....	ix
ABSTRACT.....	iv
ÖZET	vi
ACKNOWLEDGMENT.....	viii
CONTENTS.....	ix
LIST OF TABLES	xii
SYMBOLS AND ABBREVIATIONS INDEX	xiii
PART 1	1
INTRODUCTION	1
PART 2	5
LITERATURE REVIEW	5
2.1. COLORECTAL CANCER	5
2.2. TYPES OF COLORECTAL CANCER.....	6
2.2.1. Sporadic CRC	6
2.2.2. Colorectal cancer of inherited nonpolyposis (CCNS):	6
2.3. RISK FACTORS.....	7
2.3.1. Non-Modifiable Risk Factor.....	7
2.3.1.1. Age.....	7
2.3.1.2. Genetics	8
2.3.1.3. Inflammatory Bowel Diseases	8
2.3.1.4. Personal History of Adenomatous Polyps	9
2.3.1.5. Family History of Colorectal Cancer or Adenomatous Polyp.....	9
2.3.2. Modifiable Risk Factors	10
2.3.2.1. Nutritional Practices	10
2.3.2.2. Obesity	10
2.3.2.3. Tobacco use	11
2.3.2.4. Alcohol	11

	<u>Page</u>
2.4. DIAGNOSIS, SCREENING, PREVENTION.....	12
2.4.1. Screening Methods	12
2.4.1.1. Fecal Occult Blood Test (FOBT)	13
2.4.1.2. Flexible Sigmoidoscopy (FS I G)	14
2.4.1.3. Colonoscopy	14
2.5. IMPORTANCE OF SCREENING	15
2.6. TREATMENTS	16
2.6.1. Chemotherapy	17
2.6.2. Targeted Therapy	17
2.6.3. Surgical Therapy	18
2.6.4. Radiation Therapy	18
2.7. THE ROLE OF NURSING.....	19
 PART 3	 21
METHODS	21
3.1. RESEARCH DESIGN	21
3.2. SETTING OF THE STUDY	21
3.3. STUDY SAMPLES	21
3.4. DATA COLLECTION.....	22
3.5. MEASUREMENTS	22
3.6. STATISTICAL ANALYSIS.....	24
3.7. ETHICAL CONSIDERATION	24
3.8. LIMITATION OF THE STUDY	25
 PART 4	 26
RESULTS	26
4.3. PARTICIPANT’S HEALTH BEHAVIORS RELATED TO COLORECTAL CANCER.....	29
4.4. PARTICIPANT’S ATTITUDES TOWARD COLORECTAL CANCER	31
4.5. ASSOCIATION BETWEEN OVERALL KNOWLEDGE LEVEL AND SOME INDEPENDENT VARIABLES	32

	<u>Page</u>
PART 5	34
DISCUSSION	34
PART 6	40
CONCLUSION AND RECOMMENDATIONS.....	40
REFERENCES.....	42
APPENDIX 1.....	48
APPENDIX 2.	49
APPENDIX 3.....	50
QUESTIONNAIRES FORM.....	50
RESUME	52

LIST OF TABLES

	<u>Page</u>
Table 4.1. Socio-demographic characteristics of participants	24
Table 4.2. Participant's health history about colorectal cancer	25
Table 4.3. Participant's knowledge about colorectal cancer risk factors	26
Table 4.4. participant's overall knowledge level	27
Table 4.5. Participant's knowledge about colorectal cancer symptom	27
Table 4.6. Participant's knowledge about colorectal cancer screening	28
Table 4.7. Participant's health behavior related to colorectal cancer	29
Table 4.8. Participant's attitudes toward colorectal cancer.....	31
Table 4.9. Association between overall knowledge and participants' characteristics	32
Table 4.10. Association between overall knowledge level and participants' behavior	33

SYMBOLS AND ABBREVIATIONS INDEX

SYMBOLS

- % : Percentage
- N : Number
- > : Greater than
- < : Less than
- \geq : Greater than or equal to
- \leq : Less than or equal to
- B : Regression coefficient.

ABBREVIATIONS

- CRC : Colorectal cancer
- FOBT : Fecal occult blood test
- IBD : Inflammatory bowel disease
- FSIM : Flexible sigmoidoscope
- BC : Bowel cancer

PART 1

INTRODUCTION

Colorectal cancer (CRC) is characterized by a sequence of events during which normal colonic epithelium gradually transforms to carcinoma tissue, in most cases via the development of colorectal adenomas (Granados-Romero et al., 2017; Arvelo et al., 2015; Mármol et al., 2017). The disease usually progresses from a benign polyp into dysplasia adenoma into a metastatic-potential carcinoma. When diagnosed at a late stage, the high incidence combined with high disease mortality means the need for better diagnostic, prognostic, and predictive tools (Berg & Søreide, 2011).

Colorectal cancer is a critical global health problem, and it shows high rates of incidence and mortality globally (Arnold et al., 2017; López-Abente et al., 2010). CRC continues to be in the world's top five in terms of cancer incidence and mortality and is also the most diagnosed form of cancer globally, comprising 11% of all cancer diagnoses (Molokwu, Shokar & Dwivedi, 2017; Rawla et al., 2019). The CRC is the second most deadly cancer worldwide, with about 881,000 deaths estimated for 2018. CRC is more incident among men than women and is 3–4 times more common in developed than in developing nations (Rawla et al., 2019; Scholfeild, 2014). While the incidence of this neoplasm has also increased in previously low-incidence regions since 1950, CRC occurs primarily in Western and developed countries (Alrubaie, Alkhalidi & Abd-Alhusain, 2019). Colorectal cancer is a major health problem in developing nations, both due to its high prevalence and its heavy mortality (López-Abente et al., 2010).

Many factors may increase or decrease CRC risk. These factors are non-modifiable, such as a personal or family history of CRC or a history of inflammatory bowel disease, although other risk factors in lifestyle, such as smoking, alcohol use, and lack

Of physical activity, are modifiable. Recently, it has been confirmed that following a healthy lifestyle that involves being physically active for at least 30 minutes a day, maintaining a balanced diet, regulating abdominal adiposity, not smoking, and not consuming excessive alcohol may have prevented 23% of CRC cases in a cohort of over 50,000 people aged 50–64 years who were cancer-free at baseline and followed up on a follow-up of 10 years (Scholfeild, 2014). The etiology appears to be related to environmental factors for most CRC cases. The disease occurs more commonly in upper socio-economic communities living in urban areas. Geographic incidence patterns are due to genetic differences as migrant groups appear to presume the incidence levels of large bowel cancer in their adopted countries, while a high-fat diet of animals (western diet) is associated with a higher incidence of CRC, a low-fat diet (rich in fruits and vegetables) tends to protect against the production of this malignant condition (Alrubaie et al., 2019).

With an earlier diagnosis of colorectal cancer, the prognosis is better. early detection Colorectal cancer can have a variety of outcomes. Targeting pathways involved in colorectal cancer could help. Anti-epidermal growth factor, for example, has been linked to the development of cancer. treatment for the epidermal growth factor receptor (EGFR) (Museum, 2016). Colorectal cancer has a precancerous stage which makes it possible to detect and intervene early by screening (Molokwu et al., 2017). The primary goal of colorectal cancer screening is to interrupt the malignant progression of adenomatous polyps which sequence of adenoma to carcinoma, leading to disease prevention A secondary goal is to detect colorectal cancer at an early stage when treatment is more likely to be successful since 5-year survival rates improve with early detection and treatment of colorectal cancer. Screening for CRC has been shown to reduce the occurrence of CRC cancers and decrease mortality (McGarragle et al., 2019). In one study, it was showed a significant reduction in mortality with early detection of cancer and adenomas (Ng & Wong, 2013). CRC screening proved effective in minimizing the occurrence and mortality of CRCs (Woudstra et al., 2016)

Colorectal cancer is one of the few cancer types for which primary, as well as secondary treatment, is possible. Concerning secondary prevention, the data indicates that population-based screening using the fecal occult blood test (FOBT) and colonoscopy, if FOBT tests are accurate, also decreases CRC incidence and mortality

(Taberero et al., 2010; Ramos et al., 2010), Worldwide, there are many diagnostic techniques in use, including fecal occult blood testing (FOBT), adjustable sigmoidoscopy, colonoscopy, and barium enema. In the United Kingdom, the National Bowel Cancer Screening Service (NBCSP) is carrying out biennial fecal occult blood testing (FOBT) – a procedure that tests blood stool samples that may indicate, anomalies. Flexible sigmoidoscopy (FS), which involves (Robb et al., 2008). The most common methods are regular or biannual fecal occult blood test (FOBT), colonoscopy every 10 years, and recto-sigmoidoscopy per 5 years (Gimeno Garcia et al., 2014).

The American Cancer Society recommends that men and women 50 years of age and older be screened annually for colorectal cancer with annual fecal occult blood testing (FOBT) and/or every 5 years for occasional versatile sigmoidoscopy, colonoscopy, or barium enema (Dolan et al., 2004). Several studies have shown that colorectal cancer mortality can be decreased by screening asymptomatic persons at an average risk beginning at 50 years of age (Harewood & Lieberman, 2004). Screening for colorectal cancer (CRC) is the process of discovering early-stage CRCs and precancerous lesions in persons who are asymptomatic and have no history of the disease. Lesions that are malignant or precancerous (Rex et al., 2017). CRC screening programs have been implemented to facilitate early detection and encourage regular screening of average individuals at risk (Althobaiti & Jradi, 2019).

In recent decades, Iraq has seen a steady increase in CRC levels among its general population, according to the World Health Organization (WHO) and the Iraqi National Cancer Registry (INCR) (Jillson et al., 2015). In Iraq, several studies were conducted on colorectal cancer that colorectal cancer was low, but it has increased in the last recent years (Al-Saigh et al., 2019). After cardiovascular diseases, cancer is one of the major causes of death in Iraq but there is a scarcity of data on cancer (Al Dahhan& Al Lami, 2018). In a study with the Iraq population, it was determined that patients with colorectal cancer were at a young age (Alshewered & Al-Naqqash, 2019). It is crucial to implement preventive strategies for the young population to control CRC in Iraq and to create public awareness program about colorectal cancer and the importance of screening (Al Dahhan& Al Lami, 2018). In 2018, the incidence rate of colorectal cancer in Iraq was (1936) (1023) males and (918) females (10), with (479) cases

accounting for around 6.47 percent of overall colorectal cancer in Baghdad. After lung cancer, colorectal cancer has the third highest incidence rate in Baghdad (Sadiq & Bahir, 2021). And thus demonstrated the need for a heightened awareness of CRC prevention information and compliance with screening methods among Iraqi populations. There is a lack of study to determine the Iraqi population's knowledge and practice (Jillson et al., 2015). Thus, we aimed to determine the Iraqi population's knowledge, attitude, and practice towards colorectal cancer and screening.

PART 2

LITERATURE REVIEW

2.1. COLORECTAL CANCER

Colorectal cancer (CRC) is the world's third-largest diagnosed malignant disease and the fourth-largest cause of death (Mármol et al., 2017). Approximately 1.4 million new cases are diagnosed each year, which will probably increase to 2.4 million by 2035 (Alsheridah & Akhtar, 2018). Colorectal cancer is a leading cause of global morbidity and death. (Kolligs, 2016) Sporadic colorectal cancer (CRC) is typically detected in people in their sixties, although a tiny percentage of instances are found in those under 40, and the prevalence is rising. There is a lot of debate over the clinical prognosis of young patients who are diagnosed with colon cancer (De Campos et al., 2017).

Colorectal cancer development is caused by some genetic changes involving the activation of oncogenes and the loss of tumor suppressor genes. Most colorectal carcinomas arise from benign adenomas that are progressively growing, dysplasia, and vile (finger-like) morphology (Bedi et al., 1995). The term colorectal cancer means cancer that develops slowly and starts with the growth of the tumor or tissue within the rectum or colon. If this abnormal development, known as a polyp, becomes cancerous at last, A tumor may develop on rectal or colon walls, and then grow to blood vessels or lymph vessels that increase metastases in other anatomical locations. The vast majority (more than 95%) of cancers beginning in the colorectal region are adenocarcinoma (Alsheridah & Akhtar, 2018).

The majority of CRC cases are seen in Western countries (55 percent), but this trend is shifting due to other countries' rapid development in recent years. Even Nevertheless, in 2010, Western countries accounted for only 33% of all CRC-related fatalities worldwide (Mármol et al., 2017). CRC develops when normal mucosa

becomes inflamed. Aggressive tumor that passes through various intermediates phases of premalignant and invasive malignant lesions; through screening programs, this stepwise procedure helps cancer prevention and early diagnosis when the tumor is still in its early stages and curable (Argilés et al., 2020).

2.2. TYPES OF COLORECTAL CANCER

The majority of CRC cases (approximately 95%) are sporadic (with no background or a family history of the disease). Mutated genes occur by chance in these cases (somatic mutations). Family CRCs are less common (about 5 percent) and happen when gene mutations occur from one generation to the next in a family. Mutated genes are inherited in these circumstances (germline mutation). Heredity CRCs include two inherited colorectal non-polyposis (HNPCC), (or Lynch Syndrome I and II), familial polyposis of the adenomatous syndrome (FAP), MMAP, Peutz-Jeghers Syndrome, and Juvenile Polyposis Syndrome (JPS) (Centelles, 2012).

2.2.1. Sporadic CRC

Somatic occurrences affecting both alleles and therefore not inherited approximately 60 percent to 80 percent of the tumor that is MMR-deficient. MLH1 is hypersensitive to the overwhelming majority of these. The PCR method for methylation is a simple way to test it (MSP) Other methylations, including the BRAF gene (the common somatic V600 E mutation), present in 40-60% of positive MSI-tumors and 69% of tumors without Lynch syndrome are examined by immunohistochemistry to distinguish between hereditary (Lynch syndrome) and sporadic form. Losses or gains in definite chromosome regions or loss of heterozygosity (LOH) were also observed with very small human sporadic colorectal adenomas (Centelles, 2012).

2.2.2. Colorectal Cancer of Inherited Nonpolyposis (CCNS):

Henry Lynch described colon, endometrial and stomach cancer without colonic polyposis in 1966. Later, Lynch Syndromes 1 and 2, and designed as HNPCC were the cancer families' syndromes (hereditary nonpolyposis colon cancer). In patients with HNPCC MSI-H is demonstrated by more than 90% of all colorectal cancers. In HNPCC families or atypical HNPCC families at least five genes have been mutated. CRC, as well as malignancies of the stomach, small intestine, liver, bile duct, urinary tract, brain and central nervous system, and breast, are all linked to these mutations (Centelles, 2012).

2.3. RISK FACTORS

Over 80% of patients suffering from colorectal cancer have been exposed to a range of risk factors, including men's sex, older adults, high red meal or fat, smoking, or obesity (Nasrallah & El-Sibai, 2014) and a low in vegetables and fruit diet, physical inactivity (cancer.org, 2020; Baena & Salinas, 2015). While changes to these factors may lead to a lower CRC risk, no change effect will reduce the need for screening. Other risk factors, non-modifiable such as the personal or family history of CRC colorectal polyps, hereditary conditions, such as Lynch syndrome, personal history, racial and ethnic backgrounds of inflammatory bowel disease, type 2 diabetes, etc. (cancer.org,2020; Centelles, 2012; Nasrallah & El-Sibai, 2014).

2.3.1. Non-Modifiable Risk Factor

2.3.1.1. Age

The risk of the diagnosis of colorectal cancer increases after age 40, progressively after age 40, and after age 50 significantly. Approximately 90% of cases of colorectal cancer occur in people 50 years old or older. In persons aged between 60 and 79, the prevalence was over fifty times higher. Colorectal cancer tends to increase in younger people in those under 40 years of age. Colorectal cancer is currently one of the ten

most diagnosed cancers in men and women aged 20-49 years. The duration depends on the current age of the individual (cancer.org, 2020; cdc.org,2020; Wong et al., 2019).

2.3.1.2. Genetics

Roughly 18% of all cases are family history patients. Thus, they increase the risk by two or three times as others. Moreover, this type of cancer is well linked to three major genetic disorders. The most common is Lynch syndrome or hereditary colorectal cancer that is non-polyposis (HNPCC). Family adenomatous polyposis (FAP) and Gardner syndrome are closely linked to this type of cancer (cancer.org, 2020; cdc.org,2020; Nasrallah & El-Sibai, 2014).

2.3.1.3. Inflammatory Bowel Diseases

The incidence of infectious bowel diseases like ulcerative colitis and Crohn's disease is the third cause. The longer these diseases begin and the worse inflammation, the greater the risk of colorectal cancer. But only about 2% of that cancer is linked to the diseases listed above (Nasrallah & El-Sibai, 2014). Since 1925 the association between IBD and CRC has been identified, still accounting for 10%-15 percent of IBD's deaths. IBD is still associated with the death rate of the patient. IBD-related CRC (IBD-CRC) involves younger-aged patients than sporadic CRC patients. Sporadic CRC and IBD-CRC are predicted to survive at around 50% for five years. In order to manage the CRC risk, it is essential that patients be identified and adequately supervised in these patients. Genetic and acquired factors are thought to be responsible for the increased risk of colorectal cancer in combination with IBD (cdc.org, 2020; Dyson & Rutter, 2012).

2.3.1.4. Personal History of Adenomatous Polyps

Colorectal neoplastic polyps, including tubular and vicious adenomas, are a precursor of colorectal cancer. These adenomas account for almost 95% of intermittent colorectal cancers. An individual with an adenoma history has an increased chance of developing colorectal cancer in people with unfamiliar adenoma to produce adenoma malignancy, long latency times, estimated at 5 to 10 years, are normally needed. Before a malignant transition, the diagnosis and removal of an adenoma will reduce the risk of colorectal disease. The complete elimination of the polyp or localized carcinoma is, however, associated with an increased chance that metachronous cancer may develop elsewhere in the colon and rectum (cdc.org, 2020; Wang et al., 2019).

2.3.1.5. Family History of Colorectal Cancer or Adenomatous Polyp

The majority of cases of colorectal cancer occur in patients who do not have a family history or predisposition to colorectal cancer. However, up to 20 percent of people with colorectal cancer are affected by the disease by other family members. Individually with a first-degree colorectal cancer diagnosis or adenomatous polyps are at increased risk. It is higher in people with broader family background, such as colorectal cancer or first-grade adenomatous polyps, compared to 60 years or a history of colorectal cancer or adenomatous polyps, at any age in a family of two or more first grades. The causes of increased risk are not clear but are probably due to genes or a combination of shared environmental factors (cancer.org, 2020; cdc.org,2020; (Wang et al., 2019) People with a family history of colorectal cancer, not only because of the rare high-risk syndrome but also in the general population, are at increased risk for themselves with a risk approximately twice that of people without a family history of colorectal cancer (cancer.org, 2020; cdc.org, 2020;Wang et al., 2019; Wong et al., 2019).

2.3.2. Modifiable Risk Factors

2.3.2.1. Nutritional Practices

The risk of colorectal cancer is greatly affected by diet and food behavioral changes will reduce this burden of cancer by 70%. Fatty diets, including animal fat, are a major risk factor for colorectal cancer. Fat is linked to the concept of the Western modern diet as a possible etiological factor that helps the development of a degradable, bacterial flora. Fat Bile salts contain possible cancerous N-nitro compounds. The positive correlation of beef was frequently involved in the development of colorectal cancer. The intake of high meat in colon cancer is greater than that in rectal cancer. Heme (iron) in red meat may include reasons for a positive association between red meat intake and colorectal cancer (CS Wong et al., 2019);Padmanabhan et al., 2018)

2.3.2.2. Obesity

Excess body weight has been linked to multiple diseases by Body Mass Index (BMI) and includes subjects' overweight (BMI alternatively: 25–29,9 kg/m²) and obese (BMI subs 30 kg/m²). Overweight and obesity are the fifth-largest mortality risk and represent at least 2.8 million deaths in adults each year. (Bardou et al., 2013). Colorectal cancer rates among different populations are highly correlated to economic growth. As a country undergoes an economic transition, its colorectal cancer rate increases steadily. A wide range of literature is now one of the critical, if not the most important factor, energy imbalance. Increases the risk of colon cancer over excessive energy intake concerning requirements to maintain normal body weight, although the evidence for rectal cancer is not as strong. In epidemiological studies, energy consumption and expenses cannot be measured accurately enough to calculate the energy balance, but body mass measurements provide a long time estimate of the energy balance. A higher body mass index (BMI) has been found to associate an

increased risk for colon cancer, in numerous studies including retrospective and prospective studies. The association is generally linear, and the risk is about 2 times higher in the 20 percent of people with the highest BMI, compared to the lowest 20 percent in the general population (Padmanabhan et al., 2018; Wong et al., 2019).

2.3.2.3. Tobacco Use

Tobacco remains the leading global preventable mortality source, with nearly five million deaths annually. Approximately half of all smokers die due to tobacco disease and the harmful effects of smokers. Alongside many other malignancies including throat cancer, larynx, esophagus, pancreas, stomach, colon, cervix, prostate cancer, and bladder, smoking leads to about 30% of all developmental cancers affecting over 90% of all pulmonary cancers. Some researchers are also linked to the increased risk of liver and prostate cancer in the combination of smoking and leukemia. Tobacco may work at various stages of carcinogenesis, not only contains a variety of carcinogenic agents but also causes inflammation and irritation. And it interferes with the body's normal defensive obstacles. Smoking cigarettes are not the only health effect of tobacco consumptions. Tobacco use, as is the exposure to ambient tobacco smoke, increases the risk of carcinoma (Wong et al., 2019).

2.3.2.4. Alcohol

The weight of evidence shows that high alcohol consumption increases the risk of colorectal cancer. Although not all results advocate a correlation between alcohol intake and colon cancer risk, several forward-looking and case-control studies have found that there are links. Excess alcohol consumption has also been repeatedly linked with a higher risk for colorectal adenoma. The risks of colorectal cancer are increased in high alcohol consumption, according to a new meta-analysis. In some studies, this correlation is not confused with other recognized colorectal cancer risk factors and is

frequently found in both rectal and colon cancer (Wong et al., 2019; Keum & Giovannucci, 2019).

2.4. DIAGNOSIS, SCREENING, PREVENTION

Colorectal cancer is more suitable than any other disease due to various causes for population screening. The disorder prevalence is high and the results for a large portion of infected patients are low given intense, burdensome, and at times very onerous treatments (Kuipers et al., 2015). The incidence and death caused by colorectal cancer can be reduced by screening. Prevention and early detection are therefore vital to the detection, removal, and early detection of pre-neoplastic adenomas. The established screening tools for colonoscopy, flexible sigmoidoscopy, and fecal occult blood tests (Kolligs, 2016). The 5-year survivor rate is about 90% in early-stage cancer patients compared with 10% in advanced metastatic patients. In most countries, screening aims at capturing men and women between the ages of 50-75 and variable age groups based on the available services in various systems. Adopting food interventions will also have a major impact on colorectal cancer (Kuipers et al., 2015)

2.4.1. Screening Methods

The focus of CRC screening is on asymptomatic persons over the age of 50. Age is a low (average) risk of sporadic CRC, namely, cancer or chronic inflammatory bowel disease in the negative family or case history of patients; 70 to 95% of all CRC cases are of this type of carcinoma (Bevan & Rutter, 2018). Incidence and reduction in mortality are beneficial in colorectal cancer testing (Gimeno Garcia et al., 2014). Two main types of colorectal cancer screenings are available. FOBT is a test that targets colorectal cancer, whereas flexible sigmoidoscopy, colonoscopy, and CT

colonography are tests that target both colorectal malignancies and cancer precursor lesions (Ng & Wong, 2013; Simon, 2016).

Screening can prevent colorectal cancer because it can detect precancerous growths in the colon and rectum called polyps. Although most polyps are not cancerous, their removal can prevent cancer. In addition, regular screening also increases the likelihood of colorectal cancers developing earlier when they are cured, less extensive treatment, and faster recovery (Arafa & Farhat, 2015). The incidence and death caused by colorectal cancer can be reduced by screening. Prevention and early detection are therefore vital to the detection, removal, and early detection of pre-neoplastic adenomas. The established screening tools for colonoscopy, flexible sigmoidoscopy, and fecal occult blood tests (Kolligs, 2016). A perfect disease for screening is colorectal cancer. Most cancers develop from long-lasting asymptomatic polyps, during which screening is helpful (Ng & Wong, 2013).

2.4.1.1. Fecal Occult Blood Test (FOBT)

Blood screening of stool is traditionally known as FOBT because it is meant to detect occult blood from the stool. Based upon the analyte identified FOBT falls into two main categories: FOBT and FIT. Stool blood is a non-specific discovery but can come from polyps of CRC and bigger (1 - 2 cm). Because little adenomatous polyps don't tend to bleed and cancer bleedings or large polyps can be intermittent or simply not detected in a single stool sample, proper usage of stool blood tests need annual samples (2 or 3) from successive bowel motions (Bevan & Rutter, 2018;Ladabaum et al., 2020; Bretthauer, 2011).

Fecal occult blood tests refer to the protocol of six samples taken from three consecutive patient stools after a certain diet, for the testing and testing of six samples (Byers et al., 1997). To increase sensitivity, FOBT screening should be repeated at short intervals. The concept of FOBT screening is thus a repeated approach, with the

objective population being screened annually or biennial. Typically, the FOBT test program is repetitively organized, where individuals must provide samples to test the occult blood in a laboratory, or FOBT cards can be exposed to stools in homes. (Bretthauer, 2011). A fecal occult blood test is a quick, low-cost, and noninvasive diagnostic procedure. Hemoglobin is seen in the feces, indicating that the gastrointestinal tract is bleeding (Świdarska et al., 2014; Ladabaum et al., 2020).

2.4.1.2. Flexible Sigmoidoscopy (FSIG)

Flexible sigmoidoscopy is identical to a colonoscopy except that it only examines the distal half of the colon, there is no need for sedation, and the bowel preparation is an enema on the day of the procedure. It has a sensitivity of 95 percent for detecting CRC in the section of the colon that is investigated and a sensitivity of 70% for advanced adenomas (10 mm in diameter). If lesions in the distal colon are observed, a second colonoscopy is required, at which time proximal lesions may be discovered (Simon, 2016); (Ladabaum et al., 2020) Flexible sigmoidoscopy refers to a direct visual exam by an instructional examiner using a flexible 60-cm endoscope for a lower third or half of the colorectum after satisfactory purification of the lower and sigmoid colon (Bevan & Rutter, 2018; Bretthauer, 2011).

2.4.1.3. Colonoscopy

Colonoscopy is the only technique that provides the entire colon with screening and diagnosis and therapy in a single procedure. The most available data on colonoscopy effects can be derived both from diagnostic and monitoring studies of colonoscopy and from indirect information for double-contrast barium enema as outlined above. There are not currently available randomly controlled studies evaluating colonoscopy as a test for reducing colorectal cancer mortality (Bevan & Rutter, 2018); Colonoscopy is an important part of a CRC screening program as a last verification check, and its quality is linked to the screening program's success (Chiu et al., 2017). It is very precise

and most of the precursors of CRC can be removed during the examination. However, there are several drawbacks, and many would not consider colonoscopy to be a screening method for populations other than those at high risk due to its complexity, the risk that they would drill, the screen problems, and the demand for large economic and human resources (Rex et al., 2017; Kuipers et al., 2015).

2.5. IMPORTANCE OF SCREENING

The objective of cancer screening is to reduce death through a reduction in cancer prevalence. For this purpose, modern CRC testing, which is widely recognized as non-compulsory precursor injuries by determining the earliest stage adenocarcinomas and by detecting the elimination of adenomatous polyps. Adenomatous polyps are normal in adults over 50 years of age, but most polyps do not develop into adenocarcinoma, histology and size decide on their clinical importance. The most frequently and clinically significant polyps are adenomatous polyps which affect about half and two-thirds of all colorectal polyps, and which are associated with higher CRC incidences. Most CRC screening studies, therefore, test the identifiers of invasive CRC and advanced adenomas traditionally classified as polyps greater than or equal to 10 mm or with a high degree of histological dysplasia or substantial villous component. The evidence for the relevance of CRC-growth colorectal polyps is largely indirect but never more detailed and convincing and has been detailed (Gopal, 2016). Downward trends in the rates of CRC and mortality during the last 2 decades have been significantly affected by CRC screening for colorectal cancer. Screening's clinical value is reflected in its ability to prevent cancer morbidity, mortality, and surplus treatment costs through the detection of significant lesions before they become cancerous, before they spread beyond the bowel wall (Simon, 2016). Colorectal screening is known to lead to the removal of polyps which could otherwise lead to cancer and prevent colorectal cancer. Screening may also identify colorectal cancer in the early stages, which can give a survival advantage (Hultcrantz, 2021).

Screening of colorectal cancer decreases the mortality of the disease. The number of patients who developed the disease can decrease by 20 percent and by 15 to 33 percent, according to four large, populated studies. Fecal occult blood testing (FOBT). A high follow-up rate after positive testing is a key component of the evidence that supports the effectiveness of FOBT in the screening method. During each randomized test, >80 percent of FOBT patients were tested for colon efficacy by a randomized study(Bibbins-Domingo et al., 2016).

Social standards referred to as commonly accepted or what is commonly the collaborative process that allows patients and healthcare professionals to make joint healthcare choices considering the best available scientific evidence, and values and preferences of individuals and patients are considered important for cancer screening (Fritzell et al., 2017). After 75 years, the value of early identification and care for colorectal cancer reduces. When it comes to older persons who have already been screened for colorectal cancer, there is only a moderate benefit to continuing screening between the ages of 76 and 85. Adults in this age group who have never had a colorectal cancer screening are more likely to benefit than those who have had one previously (Bibbins-Domingo et al., 2016).

CRC mortality can be reduced by 15%–33% if detected early, and screening is routinely advised for average-risk persons starting at age 50. FOBT (fecal occult blood testing), flexible sigmoidoscopy, colonoscopy, and barium enema are some of the procedures used. Some groups have proposed newer screening technologies, such as stool DNA and computed tomographic colonography, in recent years (Jones et al., 2010).

2.6. TREATMENTS

Treatment options are determined on the stage of the disease, the patient's performance level, and, increasingly, the tumor's molecular makeup. Because malignancies are

diagnosed at an earlier stage in nations with monitoring programs, both the incidence and fatality rates have decreased (Stintzing, 2014).

2.6.1. Chemotherapy

Chemotherapy may be given before surgery in some circumstances. This will aid in the tumor's shrinkage before it is removed. Chemotherapy is required in other circumstances where cancer has spread to the lymph nodes and has entered the patient's life expectancy. Oxaliplatin, irinotecan, leucovorin, UFT, capecitabine, or 5-fluorouracil are some of the drugs that may be used. Monoclonal molecular antibodies include cetuximab, panitumumab, or bevacizumab. A better understanding of tumor biology and molecular pathways and mechanisms led to the finding of new agents which target specific molecular elements of carcinogenic cells. This has helped increase the effectiveness of medicinal chemotherapy, which is now combined with targeted single-clonal antibodies. There is ample research to try and use cell signage pathways as objectives for the treatment of colorectal cancer, although these pathways are very linked and interrelated (Nasrallah & El-Sibai, 2014).

2.6.2. Targeted Therapy

The concept of targeted molecular therapy has a very long tradition. At the beginning of the 1900s. The concept of a chemical for a microorganism was first presented and applied to cancer therapy in 1988 and this idea has been revived and bloomed over the last 20 years. The development, differentiation, and migration of cells are directly inhibited, and cancer cells can be used for selective therapies. Targeted drugs may also modify the tumor microenvironment to prevent the development of the tumor and to create greater immune monitoring and attacks, including local blood and immune cells. Small molecules, such as monoclonal anti corps, are important actors of selective medication. Anti-angiogenesis therapy was first proposed as an anticancer treatment about four decades ago. Angiogenesis is essential for invasive tumor growth and

metastasis, and it is a crucial step in the progression of cancer. Angiogenic cytokines and their associated receptors, such as VEGFR, platelet derived growth factor receptor (PDGFR), and many others, are involved in tumor angiogenesis and can be targeted in vivo (Seeber & Gastl, 2016) For cell side functions like the surface of the cell. In a particular way, receptionists or membrane sites, monoclonal or therapeutic antibodies can regulate the progression and death of the downstream cell cycle. In people who are affected by cancer attacks, certain monoclonal anti corps, like the cells in the immune system (Xie et al., 2020).

2.6.3. Surgical Therapy

One of the most successful therapies for CRC is surgical resection. In China, laparoscopic resection is now a common approach of CRC surgery. Minimally invasive resection can help to speed up the healing process. Shorten the time it takes for your gastrointestinal function to heal following surgery. The length of time spent in the hospital has little effect on long-term survival (Zhang et al., 2017). Robot-assisted surgery for CRC is still in its early stages, but it can be employed for rectal and sigmoid colon resection. Robot-assisted surgery can also be used for combination resection in CRC patients with local invasion and distant metastases. The da Vinci Surgical System has been used in several hospitals and has shown to be safe and effective (Zhang et al., 2017).

2.6.4. Radiation Therapy

Radiation therapy kills cancer cells and shrinks tumors by delivering high doses of radiation. In order to localize the effects of malignancies, these high-energy beams are aimed toward their site. Although radiation is rarely used alone to treat colorectal cancer, it is occasionally used in conjunction with chemotherapy. Chemoradiation or chemoradiotherapy is a term that describes the use of radiation and chemotherapy in combination. (<https://fightcolorectalcancer.org>). Radiation kills cancer cells by

destroying their DNA, making it impossible for them to divide forever. The immune system can then break down these damaged cancer cells once they have died. When it comes to the treatment of colorectal cancer, radiation is usually used in conjunction with other treatments. Radiation therapy is generally used in conjunction with surgery to reduce tumors to make them easier to remove or to destroy residual cancer cells during or after surgery. When a patient isn't well enough for surgery, to treat cancer that has spread to other parts of the body, or palliatively to relieve symptoms of advanced stage cancer, radiation is used alongside chemotherapy (<https://fightcolorectalcancer.org>).

2.7. THE ROLE OF NURSING

The role of nursing in health promotion and prevention of BC should have a part of nursing's aim of practice. The role of nurse in CRC is to identify risk factors and have the communication and teaching skills to work with people to change behaviors to reduce risk factors. Nurses have many responsibilities to improve health promotion, to achieve this essential aim, to perform CRC screening program, to educate, provide and increase awareness among people. To improve results, prevention must be coupled with screening and early detection measures. Early detection of CRC reduces the overall costs of cancer treatment. In addition, nurses can educate the people about CRC, to improve awareness and appropriately refer for further evaluation. Further, nurses can increase adherence to screening guidelines because they are viewed as trusted members of their society. Also, the nurse role is very important to reduce the barriers of people towards CRC screening methods. As a result, nurses can act more efficiently as guides and can decrease delay in care (Slyne, Gautam, King, 2017).

On the other hand, the nurses contribute to the treatment of people who are diagnosed with an important polyp and early colon cancer. A key function of nurses is to provide the patient with direct and indirect support by diagnosis and treatment, both by contact and telephone, and by acting as a supporter at multidisciplinary team meetings. In addition, nurses can provide personal information to improve the understanding of

patients' diagnosis, to help them choose their available treatment options, and to prepare them for all treatments (Taylor et al., 2019). A member of the multidisciplinary team, the nurses offer a valuable and consistent resource in the field of bowel cancer, families, and their careers from the start of diagnosing. The nurses are well-equipped to guide patients on the challenges they face, physical, as well as emotional, in facilitating the education of patients and the good communication among health care professions. Therefore, an essential role is to inform, educate the patient and explore the patient's understanding of the information received from any team member, to optimize any decision-making process. Additional roles include emotional care, support, and coordination of every component of complex service and continuity of care (Slyne, Gautam, King, 2017; Giuliana et al., 2017).

Early diagnosis and preventive role of nurses is to inform the patient about their own risky behavior, encouraging them to work together and giving information that can enhance their practices and behaviors. Nurses can conduct activities which lead to effective CRC' early diagnosis by screening tests. On the other hand, their main responsibility is to educate the peoples about healthy lifestyle practices. Often it is the nurses' motivational and educational work that is responsible for the long-term success of preventive measures (Simonson, 2018). To date, the most effective risk-reduction guideline-based approaches have been administered by nurses globally who have the required education and experience to perform this vital leadership role. Nurses participating in the successful implementation of a multifactor interventions are skilled in prevention of smoking, diet, physical exercise, and other risky health practices for CRC (Simonson, 2018; Slyne, Gautam, King, 2017). As a result, nurses have an important role to play in encouraging and supporting peoples to participate in the screening program (Simonson, 2018).

PART 3

METHODS

3.1. RESEARCH DESIGN

A descriptive, cross-sectional exploratory study was conducted to assess Iraqi people's knowledge of colorectal cancer, risk factors and to determine attitudes towards colorectal cancer screening.

3.2. SETTING OF THE STUDY

This study was carried out at Shahid Peshraw General Hospital from 1 March 2020 to 31 of August 2021. This hospital is in Chamchamal town in the west of Sulaimaniah city in the Kurdistan Region of Iraq. Shahid Peshraw General Hospital is a public hospital that spans an area of 3000 m² and it is under the supervision Ministry Health of the Kurdistan Regional Government. All services offered in the hospital are free of charge for any patient. Shahid Peshraw Hospital is composed of internal disease, surgery, ophthalmology, and orthopedic and trauma surgery departments in addition to the polyclinic hall which provides diagnosis, management, and follow-up.

3.3. STUDY SAMPLES

A purposive sample size of 1361 persons has been selected to participate in the study between 1 March 2020 to 31 of August 2021. The inclusion criteria were: (1) people who visit the hospital for diagnosis or control (2) aged 50 years and over, (3) can read and write and well communicate (4) having no history of active or diagnosed colorectal cancer, (5) having a basic level of literacy like being fluent in English, Kurdish, or Arabic, and (6) willing to participate in the study. Excluding criteria were (1) ages

below 50 years (2) to be communication problem and (3) not willing to participate in the study.

3.4. DATA COLLECTION

A pilot study was conducted to evaluate the clarity of the questionnaire and to determine the reliability of the questionnaire and to estimate the average time required for data collection, to identify the barriers and difficulties facing the researcher during data collection, and to refine the methodology of the study. A pilot study was carried out with ten participants and a sample of the pilot study was excluded.

Data collection was conducted from March up to August 2021. After explaining the study objectives and assuring confidentiality and privacy of the data, verbal and written informed consent was obtained from each participant by the researcher. All documents, including surveys, consent forms were made available in English, Kurdish, and Arabic. A researcher translated the English materials into Arabic and Kurdish and checked the translations for accuracy. Furthermore, the tool of data collection was reviewed by two academicians who are experts in Kurdish and Arabic languages to checked it in terms of language edition. Data were collected by the researcher in real-time interviews. Data collection averaged about 20 minutes per participant.

3.5. MEASUREMENTS

The questionnaire was designed by the researcher according to literature (WHO, 2020; Bibbins-Domingo et al., 2016; Rex et al., 2017; Keum & Giovannucci, 2019). This measurement was prepared in English and translated into Kurdish and Arabic language. We used The Colorectal Cancer Risk Factors Knowledge Level (CRCRF-

KL) Scale to assess knowledge level; (STEPS; STEP 1 and 2 questionnaires) for demographic information, behavioral, and screening measurements. This instrument was controlled by three academicians in terms of content. The questionnaire consists of four parts. Overall items included in the questionnaire were 56 items, without descriptive characteristics of the participants.

Part 1: This part consisted of 11 items it is created to determine participant's socio-demographic characteristics. This is included age, gender, educational state, occupational state, marital state, history of colorectal cancer, having a chronic disease, any knowledge about colorectal cancer and its screenings if he or she did general health checkup and if he or she has a family history of CRC.

Part 2: This section aimed to determine participant's knowledge about colorectal cancer. It contains 28 items which were divided into three parts, colorectal cancer risk factors (12 items), symptoms (9 items), and screening (7 items). The correct answers (Yes) were scored 1, while the false answers (No and don't know) were scored 0. Iraqi people's knowledge means of colorectal cancer risk factors, symptoms and screening were (5.52 ± 1.39) , (3.73 ± 1.16) , and (4.35 ± 3.02) respectively. The level of knowledge of participants was founded from the total knowledge level, it consists of 28 items from 1 to 9 is low, from 10 to 18 is moderate and from 19 to 28 is a high level of knowledge.

Part 3: This part was created to determine participant's health behaviors and colorectal screening practices. It consists of 17 items. Such as tobacco use, alcohol consumption, fatty meal and red meat consumption, enough water drinking, regular exercise, and sleeping and doing CRC screening (FOBT, colonoscopy and sigmoidoscopy) by participants. The answer for each question related to knowledge was requiring a response in the form of "Yes", "No" or "Don't know".

Part 4: This section aimed to determine participant's attitudes towards colorectal cancer and consisted of 11 items. The responses were recorded on a Likert scale (Yes, No and I don't know)

3.6. STATISTICAL ANALYSIS

All data were input to the computer and analyzed using the Statistical Package for Social Science (SPSS) software, version 26.0 (IBM Corporation, Armonk, NY, USA). Descriptive statistics (percentage, mean, and standard deviation) were calculated to find the distribution of the socio-demographic characteristics of the participants, practices about colorectal cancer, knowledge, risk factor and screening methods. Categorical variables were presented as frequencies and percentages. The awareness score was presented as mean \pm SD, minimum and maximum values. Multiple regression analysis was used to identify any kind of association between different variables in the study.

3.7. ETHICAL CONSIDERATION

Approval was obtained from the ethical committee in Karabuk University with the project-wide variety (2020/289) at the date of (16-10-2020) (Appendix 1). Formal administrative approval was obtained from the General Directorate of health-Sulaimanyah for collecting data from participants (Appendix 2). Individuals were contacted and explained the purpose of the study. They were free to refuse participation in the study. Data were collected anonymously via a self-administered questionnaire. (Appendix 3) Those who agreed to take part in the study were given the questionnaires, which were completed anonymously and collected after completion. They were assured of confidentiality and gave written consent to participate in the study. Incentives were not offered for the completion of the questionnaire.

3.8. LIMITATION OF THE STUDY

During the targeted time of data collection, the coronavirus (COVID-19) pandemic reached Iraq. Data collection was delayed about 4 months due to complete lockdown and curfew. Also, there were difficulties to communicate with people because of the virus risks.

PART 4

RESULTS

In this part, it was showed the result of Iraqi people's knowledge and attitude towards colorectal cancer and screening practices.

Table 4.1 shows that 28.1% of the participants age were between 50-54 years old, and most of the participants (70.8%) were male. Also, most of them (89.9%) were married, 40.0% of the participants were graduated from secondary school, 63.7% of study samples were employed, and 18.4% of them were retired.

Table 4.1.Socio-demographic characteristics of participants

Socio-demographic characteristics	N	(%)			
Age groups					
50-54	382	28.1			
55-59	364	26.7			
60-64	253	18.6			
65-69	201	14.8			
70 and above	161	11.8			
Age	Mean	Median	Std. Deviation	Minimum	Maximum
	59.80	59.00	7.178	50	80
Gender			N	(%)	
Male	964	70.8			
Female	397	29.2			
Marital status					
Single	54	4.0			
Married	1224	89.9			
Divorced	83	6.1			

Table 4.1 (continued)

Level of Education	n	(%)
No formal schooling	252	18.5
Primary education	247	18.1
Secondary school	545	40.0
High school	307	22.6
College/University and above	10	.7
Working status		
Government employee	620	45.6
Self-employed	246	18.1
Homemaker	96	7.1
Retired	250	18.4
Unemployment	149	10.9

Table 4.2 indicates that the majority of participants 97.8% have no history of colorectal cancer. Also, 76.1% of study samples didn't have any chronic disease, and 60.8% of participants heard colorectal screening tests. Regarding general health check-ups, only 18.5% of participants performed general check-ups. While 60.5% of participants know the CRC risk factor. About the family history of CRC majority of the participants (91.2%) had no history of this malignancy, and 8.8% of participants had the family history of colorectal cancer.

Table 4.2. Participant's health history about colorectal cancer

Items	Yes	No
	n (%)	n (%)
Personal history of colorectal cancer	30 (2.2)	1331 (97.8)
Presence chronic diseases	325 (23.9)	1036 (76.1)
Have you heard of screening tests for colon or rectal cancer	827 (60.8)	534 (39.2)
Doing general health check	252 (18.5)	1109 (81.5)
Information about colorectal cancer and risk factors	823 (60.5)	538 (39.5)
Familial history of pre cancer lesions or colorectal cancer	120 (8.8)	1241 (91.2)
If yes who? (n=120)		
Father	30 (2.2)	
Mother	14 (1.0)	
Brother	49 (3.6)	
Sister	27 (2.0)	

Table 4.3 reports the participant’s knowledge about colorectal cancer risk factors. Near half of participants (50.7%) believed that the presence of polyp may lead to colorectal cancer. While 40.1% of study samples agreed that a family history of CRC increases the chance of getting colorectal cancer. Also, most of the participants (50.6%) agreed with the statement that smoking is one of the risk factors of CRC, and 40.3% of participants correctly agreed that alcohol consumption is a risk factor of CRC. Besides, 50.6% and 45.0% of participants believed that aging and diabetes type 2 are CRC risk factors, respectively.

Table 4.3. Participant’s knowledge about colorectal cancer risk factors

Items	Yes	No	Don’t know	
	n (%)	n (%)	n (%)	
1. The presence of colon polyps can lead to colorectal cancer	690 (50.7)	287(21.1)	384(28.2)	
2. The presence of a history of colorectal cancer in the family is one of the risk factors of colorectal cancer	546 (40.1)	674 (49.5)	141 (10.4)	
3. Smoking is a risk factor for colorectal cancer	688 (50.6)	520 (38.2)	153 (11.2)	
4. Overweight people have a higher risk of colorectal cancer	693 (50.9)	429 (31.5)	239 (17.6)	
5. Inflammatory bowel disease may increase the risk of colorectal cancer	616 (45.3)	402 (29.5)	343 (25.2)	
6. Less than 30 minutes of physical activity a day is a risk factor for colorectal cancer	536 (39.4)	428 (31.4)	397 (29.2)	
7. Low protein, fiber diet, low fruit and vegetables and nutrition are risk factors for colorectal cancer	686 (50.4)	289 (21.2)	386 (28.4)	
8. Alcohol consumption can lead to colorectal cancer	548 (40.3)	670 (49.2)	143 (10.5)	
9. Stress is a risk factor for colorectal cancer	686 (50.4)	520 (38.2)	155 (11.4)	
10. Aging is a risk factor that increases the risk of colorectal cancer	686 (50.4)	436 (32.0)	239 (17.6)	
11. Type 2 diabetes mellitus may increase colorectal cancer.	612 (45.0)	401 (29.5)	348 (25.6)	
12. Red or processed meat consumption can lead to colorectal cancer.	539 (39.6)	426 (31.3)	396 (29.1)	
Total risk factor score	Mean	Std. Deviation	Minimum	Maximum
	5.52	1.39	0	12

About participant's knowledge regarding colorectal cancer symptoms Table 4.4 shows that approximately 33.8% of study samples accepted that changes in bowel habits are the sign of CRC, as well as 41.7% of them agreed that weight loss can be one of the symptoms of colorectal cancer. 30.9% and 50.6% of participants believed that blood in stool and low back pain are symptoms of CRC, respectively.

Table 4.4. Participant's knowledge about colorectal cancer symptom

Items	Yes	No	Don't know	
	n (%)	n (%)	n (%)	
1. Any change in bowel habit (constipation, diarrhea) can be a sign of colorectal cancer	460 (33.8)	626 (46.0)	275 (20.2)	
2. There may be lower abdominal pain due to colorectal cancer	537 (39.5)	505 (37.1)	319 (23.4)	
3. Rectal bleeding is part of the colorectal cancer symptom.	622 (45.7)	498 (36.6)	241 (17.7)	
4. Weight loss can be one of the symptoms of colorectal cancer.	567 (41.7)	547 (40.2)	247 (18.1)	
5. Fatigue, loss of appetite can be a symptom of colorectal cancer.	559 (41.1)	452 (33.2)	350 (25.7)	
6. Blood in stool may be due to colorectal cancer.	420 (30.9)	634 (46.6)	307 (22.6)	
7. Anal pain can be a symptom of colorectal cancer.	562 (41.3)	559 (41.1)	240 (17.6)	
8. Low back pain may be due to colorectal cancer	688 (50.6)	493 (36.2)	180 (13.2)	
9. Lump in the abdomen during bowel empty may be one of colorectal cancer symptom	674 (49.5)	486 (35.7)	201 (14.8)	
Total symptoms score	Mean	Std. Deviation	Minimum	Maximum
	3.73	1.16	0	9

Regarding participant's knowledge about colorectal cancer screening Table 4.5 shows that many participants (93.7%) believed that regular screening is essential to prevent colorectal cancer. Also, most of the participants (55.5%) agreed that CRC screening should begin at the age of 50. While 68.3% of participants believed that sigmoidoscopy should be done every 5 years, and colonoscopy should be done every 10 years after the age of 50 (79.0%), respectively.

Table 4.5. Participant's knowledge about colorectal cancer screening

Items	Yes	No	Don't Know	
	n (%)	n (%)	n (%)	
1. Colorectal cancer screening tests are good methods for early diagnosis of cancer	1321 (97.1)	14(1.0)	26 (1.9)	
2. Regular screening is essential to prevent colorectal cancer	1275 (93.7)	26 (1.9)	60 (4.4)	
3. Fecal occult blood test, sigmoidoscopy and colonoscopy are the tests used in the early diagnosis of colorectal cancer	1085 (79.7)	64 (4.7)	212 (15.6)	
4. Colorectal cancer screening should begin at the age of 50 even if there are no signs and symptoms	755 (55.5)	102 (7.5)	504 (37.0)	
5. Fecal occult blood test should be done annually after 50 years of age	765 (56.2)	168 (12.3)	428 (31.4)	
6. Sigmoidoscopy should be done every 5 years after the age of 50.	929 (68.3)	182 (13.4)	250 (18.4)	
7. Colonoscopy should be done every 10 years after the age of 50.	1075 (79.0)	92 (6.8)	194 (14.3)	
Total screening score	Mean	Std. Deviation	Minimum	Maximum
	4.35	3.02	0	7

Regarding participant's overall knowledge level Table 4.6 shows that 4% of participants have low knowledge level, and 89.1 of participants have moderate knowledge, while 6.9% of participants have high knowledge level.

Table 4.6. Participant's overall knowledge level

Knowledge levels	n	(%)
Low knowledge	54	4.0
Moderate knowledge	1213	89.1
High Knowledge	94	6.9

Regarding participant's health behavior Table 4.7 shows that approximately 51.7 % of participants was smoker. While only 0.4% of participants were alcohol drinkers. About dietary habits, nearly 95% of participants didn't eat fatty foods, and 90.8% of them have a low fiber diet. Also, 80.1% of the study sample have regular bowel habits. Besides 6.1% of participants performed colonoscopy and 4.9% had sigmoidoscopy.

Table 4.7. Participant's health behavior related to colorectal cancer

Items		n	%
Do you smoke tobacco products such as cigarettes?	Yes	703	51.7
	No	658	48.3
In the past, did you ever smoke any tobacco products?	Yes	703	51.7
	No	658	48.3
Do you use alcohol?	Yes	5	0.4
	No	1356	99.6
If yes, how often do you consume alcohol(n=5)	Daily	2	40.0
	Weekly	3	60.0
Do you eat fatty food?	Yes	83	6.1
	No	1278	93.9
Do you eat red meat every day?	Yes	192	14.1
	No	1169	85.9
Do you have a low fiber diet?	Yes	1236	90.8
	No	125	9.2
Do you drink enough water?	Yes	1227	90.2
	No	134	9.8
Do you have regular bowel habits?	Yes	1090	80.1
	No	271	19.9
Do you do regular exercise?	Yes	554	40.7
	No	591	43.4
	Sometimes	216	15.9
Have you taken an enough rest and sleeping	Yes	908	66.7
	No	453	33.3
Have you had a stool secret blood test before?	Yes	174	12.8
	No	1187	87.2
If did, how many years ago? (n=174) *	0-2 years	54	31.1
	3-5 years	120	68.9
Have you had a colonoscopy before?	Yes	83	6.1
	No	1278	93.9
If did, how many years ago? (n=83) *	0-2 years	36	43.4
	3-5 years	46	56.6
Have you ever had a sigmoidoscopy?	Yes	55	4.0
	No	1306	96.0
If did, how many years ago? (n=55) *	0-2 years	28	50.9
	3-5 years	22	49.1

* Percentages are calculated over n numbers

Participant's attitudes toward the colorectal cancer are showed in Table 4.8. 32.8% of participants thought that they have a chance of getting CRC like other people, and approximately 51.8% of participants believed that early diagnosis of CRC is good. Also, it was found that 48.3% of participants afraid of the CRC screening test. While 40.9% of participants agreed that regular screening for bowel cancer increases the

chance of preventing CRC. Besides, 29.6%, 35.4 of participants worried colonoscopy and sigmoidoscopy would be embarrassing and painful, respectively.

Table 4.8. Participant’s attitudes toward colorectal cancer

Items	Yes	No	Don’t know
	n (%)	n (%)	n (%)
I think my risk of having bowel cancer is the same as everyone else	446 (32.8)	626 (46.0)	289 (21.2)
It is better to diagnose bowel cancer early by screening.	705 (51.8)	485 (35.6)	171 (12.6)
I am afraid to have a bowel cancer screening test	658 (48.3)	548 (40.3)	155 (11.4)
There are so many different suggestions on preventing bowel cancer that I do not know which one to get.	402 (29.5)	658 (48.3)	301 (22.1)
I am reluctant to participate in bowel cancer screening methods because I am afraid of cancer	402 (29.5)	556 (40.9)	403 (29.6)
Regular check for bowel cancer increases the chance of preventing this cancer	557 (40.9)	403 (29.6)	401 (29.5)
I am reluctant to get checked for colorectal cancer because the test is embarrassing	428 (31.4)	757 (55.6)	176 (12.9)
I believe that I am at risk of getting bowel cancer	760 (55.8)	462 (33.9)	139 (10.2)
I do not want to change my lifestyle (activity, smoking, alcohol)	647 (47.5)	526 (38.6)	188 (13.8)
I am worried colonoscopy and sigmoidoscopy would be embarrassing	403 (29.6)	668 (49.1)	290 (21.3)
I am worried colonoscopy and sigmoidoscopy would be painful	482 (35.4)	482 (35.4)	397 (29.2)

Association between overall knowledge and participants’ characteristics was reported in Table 4.9. In this study, it was found that there was no significant relationships between overall knowledge and age group, education level, and information about CRC. However, the knowledge about CRC was significantly greater among participants in the working status compared to other age groups ($p = 0.005$)

Table 4.2. Association between overall knowledge and participants' characteristics

Characteristic	B*	Standard error	OR (95% CI)	P-value
Gender				.687
Male	.092	.2295	1.097 (0. 699 - 1.720)	
Age groups				.099
50-54	.925	.3809	2.522 (1.195 - 5.321)	
55-59	.526	.3810	1.692 (0.802 - 3.572)	
60-64	.365	.3758	1.440 (0.689 - 3.008)	
65-69	.387	.3531	1.472 (0.737 - 2.941)	
70 and above	0 ^a	.		
Marital status				.296
Married	0.602	0.3898	1.825 (0.850 - 3.919)	
Single	0.459	0.5770	1 (.426 - 1.582)	
Divorced	0 ^a	.	1	
Level of Education				.382
No formal schooling	1.485	.8424	0.226 (0.043- 1.180)	
Primary education	1.338	.8195	0.262 (0.053- 1.308)	
Secondary education	1.432	0.7947	1 (0.072 - 0.239)	
High school	1.432	0.7947	0.239 (0. 050 - 1.134)	
College/university and above	0 ^a	.	1	
Working status				.005
Un-employee	0.969	0.4940	1 (0.050 - 0.380)	
Government employee	0.011	.4772	1.011 (0.397- 2.575)	
Self-employed	0.029	0.4891	1.030 (0.395- 2.685)	
Retired	0.506	.5204	1.659 (0.598- 4.601)	

B* regression coefficient.

In this study, Table 4.10 reports that association between overall knowledge level and participants' behaviors. It was found that there were no significant differences between participants overall knowledge level and behaviors.

Table 4.10. Association between overall knowledge level and participants' behavior

Characteristic	B*	Standard error	OR (95% CI)	P-value
Smoking	-0.367	0.1795	0.693(0.487-0.985)	0.060
Alcohol drinking	1.777	1.1556	0.169(0.018-1.629)	0.171
Eating fatty meal	-0.135	0.4179	0.874(0.385-1.982)	0.746
Red meat eating	0.420	0.2924	1.522(0.858-2.699)	0.156
Low fiber diet eating	0.051	0.3217	1.052(0.560-1.976)	0.875
Drinking water	0.376	0.3394	1.457(0.749-2.833)	0.267
Regular exercise	0.183	0.2620	1.200(0.718-2.006)	0.515
Done FOBT	0.007	0.2712	1.007(0.592-1.713)	0.980
Done colonoscopy	0.393	0.3628	1.482(0.728-3.017)	0.287
Done sigmoidoscopy	-0.062	0.4404	0.940(0.396-2.228)	0.888

B* regression coefficient.

PART 5

DISCUSSION

Colorectal cancer (CRC) is besides breast, prostate, lung and skin cancers the most common cancers worldwide, and the annual incidence in the world is slightly over 1 million in men and 79 500 in women, and mortality was 475 000 in men and 387 000 in women (Hultcrantz, 2021). The wide application of screening programs in many countries has led to early detection and regression in the prevalence of the disease over the last years in these countries and CRC is now considered to be a preventable disease (Radhi et al., 2018).

The results of the present study showed that 54.8% of study participants were 50-59 years old and this will agree with a study done by Janda et al.,(2003) in Australia. The result was 58% of participant were from 50-59 years. Regarding the gender in the previous study, the majority of participants (70.8%) was male. One study done by Hussain et al., (2021) in Pakistan the male ratio in that study was (76.8%). Concerning the marital status, 89.9% of participants were married. This is supported by a cross-sectional study done by Sessa et al.,(2008) in Italy the study shows that the majority of participants (93.4%) was married, Also, it is supported by a cross-sectional study conducted in Saudi Arabia by Almadi et al., (2015) the results shows that (83.6) of respondents were married. Moreover, it supports a cross-sectional survey conducted in Iran by Salimzadeh et al., (2011) the results shows that (85%) of participants were married. Regarding the level of education, approximately 40% of the study participant are from secondary school, and this was supported by a cross-sectional study in China by Huang et al., (2011) its results show that (37.3) of participants from secondary school. Also its supported by a study done in Malaysia by Jores et al., (2021) that shows the (41.0) of its participants was from secondary school also it is supported by a cross-sectional study in Indonesia by Abdullah et al., (2009) its result show that (30%) of respondents was from secondary school. About the working status, 45.6% of participants were Government employee, and this supported by a cross-sectional study in Saudi by (Almadi et al., 2015) its results was (37.9) of participants were governments employee.

Regarding of presence of individual colorectal cancer history (2.2) of participant in resent study have a personal history of CRC, and this supported by a cross-sectional study in Iran by Khakbaz Alvandian et al., (2019) its result shows that (1.2) of participants were have a personal history of colorectal cancer. Concerning if participants heard about colorectal cancer screening (60.8) of them answered yes and this result near to a cross-sectional study in Saudi Arabia by Chowdhury & Chakraborty, (2017) its result shows that (47.2) of participants were heard about CRC screenings. Regarding the family history of CRC, the results show that (8.8%) of the participants had family history of CRC. and this finding is supported by a study in Malaysia by Al-Dubai et al., (2013) its findings shows that (10%) of participants had a CRC family history. Also its supported by a cross-sectional study in Malaysia by Rosli et al., (2017) the findings were (8.7%) of the participants were had a family history of CRC.

Regarding the knowledge of participants about CRC risk factor the result in present study shows that (50.7) of participants believe that presence of polyp may be lead to CRC, this result is supported by a cross-sectional study in Saudi by Chowdhury & Chakraborty, (2017) its result show that (41.6%)of participants thought that presence of polyp may lead to CRC. Concerning presence of bowel polyp can be risk factor for CRC (50.7%) of participants in present study thought that its true and can be a risk factor, this result is agree with a cross-sectional study in Italy by Sessa et al., (2008) the results show that (62.9%) of participants agree with polyp can be one of CRCs risk factor.

Regarding tobacco smoking in present study (50.6) of participants agree that smoking is a risk factor for colorectal cancer. This result supported by a study in Pakistan by Hussain et al., (2021) its results shows that (49.3%) of participants believe that a smoking is a risk factor for CRC. Also its near to a result of a cross-sectional study in United Arab Emirates by Al Abdouli et al., (2018) the results show that (45%) of participants thought that smoking is a risk factor for CRC. About inflammatory bowel disease as a risk factor (45.3%) of participants in the present study thought that IBD is a risk factor to get colorectal cancer, and

it's supported by a cross-sectional study in Saudi its result shows that (61.0%) of participants thought that Inflammatory bowel disease is a risk factor for getting CRC.

Regarding overweight can be a reason for CRC (50.9%) of participants in present study agree with it. This result supported by a cross-sectional study in U S A by Jillson et al., (2015) the result was (50%) of participants thought that overweight is a risk factor for colorectal cancer. Also another study support this result done in Saudi Arabia by Al-Thafar et al., (2017) the result was (44.4%) agree with that overweight is a risk factor for colorectal cancer. Moreover a cross-sectional study in Malaysia by Al-Dubai et al., (2013) supported the resent study's result (60%) of participants thought that obesity is a risk factor for CRC.

Concerning the physical activity less than 30 Minuit per a day (39.4%) of participants thought that daily physical activity less than 30 min per day can be a cause of CRC. And this result supported by a cross-sectional study done in Saudi by Chowdhury & Chakraborty, (2017) the results were (33.8%) of participants were believe that low physical activity can be a risk factor for colorectal cancer. Also the cross-sectional study support this result done in Iran by Khakbaz Alvandian et al., (2019) its results show that (45.2%) of participant agree with that physical activity less than 30 Minuit per a day can lead to CRC.

Concerning alcohol consumption (40.3%) of participants in present study thought that it's a risk factor for colorectal cancer. this results in agreement with a cross-sectional study in United Arab Emirates by Al Abdouli et al., (2018) it's result was (45%) of participant believe that consumption of alcohol may lead to CRC.

About age more than 50 years old if it will be a risk factor (50.4%) of participants in present study thought that its true and it can be risk factor, and this result supported by a cross-sectional study in Iran by Salimzadeh et al., (2011) the results shows that (57%) of participants agree with that people more than 50 years can get CRC. In this study (50.4%) of participants thought that low fiber is a risk factor for CRC, this results are supported by a

study in Pakistan by Hussain et al., (2021) the results show that (54.3%) of participants believe that low fiber diet due to colorectal cancer.

Regarding the symptoms of CRC in this study (33.8%) of participants thought that any change in bowel habit may be a sign of colorectal cancer. This result is similar to a study in Saudi Arabia by Al-Thafar et al., (2017) the results shows that (34.1%) of the participants agree with that change in bowel habit is a sign of colorectal cancer.

Regarding rectal bleeding as a symptom of CRC in this study (45.7%) of the participants believe it's a symptom of colorectal cancer. The result in present study is supported by a cross-sectional study in Pakistan by Hussain et al., (2021) its result shows that (43.4%) of respondents agree with that anal bleeding is a sign of colorectal cancer.

In our study (41.7%) of respondents thought that sudden weight loss is a sign of CRC, this result is in agreement with a study in Saudi Arabia done by Chowdhury & Chakraborty, (2017) results show that (38.1%) of respondents thought that sudden weight loss is a sign of colorectal cancer. In the present study (30.9%) of participants believes that presence of blood in stool may be a sign of CRC. This result is near to the cross-sectional study in Saudi by Chowdhury & Chakraborty, (2017) the results show that (38.1) of participants thought that presence of blood in stool is a sign of CRC.

In this study (39.5%) of respondents agree with that abdominal pain is a sign of colorectal cancer. And this result is supported by a cross-sectional study in Saudi done by Al-Thafar et al., (2017) it's results show that (34.1%) of respondents agree with that abdominal pain may be a sign of colorectal cancer, also it's supported by a study in Saudi by Chowdhury & Chakraborty, (2017) the results shows that (31.2%) of respondents agree with that abdominal pain is a sign of CRC.

Regarding the smoking in present study (51.7%) of participants are smoker. This result is near to a cross-sectional study in Iraq by Coll et al., (2019) the result was (37.9%) of

participants were smoker. Concerning fatty food eating in present study (6.1%) of respondents are eating fatty food always. And this result is supported by a cross-sectional study in Nigeria by Odukoya & Fayemi, (2019) the result shows that (15.2%) of respondents eat fatty food always.

About red meat consumption daily in our study (14.1%) of participants eat red meat more than 5 times in a week. The result is supported by a cross-sectional study in Kuwait by Alsheredah & Akhtar, (2018) the result shows that (20.4%) of participants consumption red meat more than 5 times in a week. Regarding regular exercise in present study (40.7%) of the respondents do regular exercise daily. This result is same to a cross-sectional study in Pakistan by Hussain et al., (2021) the results show that (34.4%) do regular exercise.

Concerning FOBT screening (12.8%) of participants done it before in this study. And this result supported by a cross-sectional study in Australia by Christou & Thompson, (2012) results show that (5.6%) of its participants done FOBT. About colonoscopy tasting in the present study (6.1%) of respondents said that they do this test before. This result is near to a study in Malaysia by Rosli et al., (2017) its results was (10.6%) of respondents were done colonoscopy before. Concerning sigmoidoscopy examination (4.0%) of participants answered that they done this test before. The result is supported by cross-sectional study in Malaysia by Rosli et al., (2017) the results were (9.6%) of participants were done sigmoidoscopy before.

Regarding participants attitude toward colorectal cancer (32.8%) of participants thought that they have a chance to get CRC like others. This result is supported by a cross-sectional in Australia by Christou & Thompson, (2012) the results shows that (32.0%) of participants thought that they are at risk of getting colorectal cancer. More than half of respondents (51.8%) believe that it's better to diagnosing CRC early by screening. The result of present study is near to a cross-sectional study in Pakistan by Hussain et al., (2021) (45.7%) of respondents believe that early diagnosing of CRC is better to treating.

Regarding colon or rectum screening for colorectal cancer (48.3%) of participant were afraid from it because they are afraid if it will be positive. The result is supported by a study in Pakistan by Hussain et al., (2021) the results were (53.0%) of participants were afraid from doing screening. In the present study (40.9%) of respondents thought that regular check for CRC is increase the chance of prevent this malignancy. The result is supported by a cross-sectional study in Pakistan by Hussain et al., (2021) the results shows (45.0%) of participants thought that regular check can be prevent of CRC.

In our study (29.6%) of participant's worried if colonoscope and sigmoidoscope been embarrassing. The result is too close to the result of a study in Malaysia by Al-Dubai et al., (2013) the results shows that (31.5%) of participants worried if sigmoidoscope will being embarrassing. Concerning to change of lifestyle to prevent CRC in this study (38.6%) of respondents are ready to do it. The result is supported by cross-sectional study in Pakistan by Hussain et al., (2021) the results shows that (48.7%) of respondents were agree to change life style to prevent the colorectal cancer.

About fear of colonoscopy and sigmoidoscopy is painful in present study (35.4%) of participants thought it will be painful. And this result is near to a cross-sectional study in Malaysia by Al-Dubai et al., (2013) the results were (29.8) of participants thought that colonoscopy and sigmoidoscopy will be painful.

Concerning the relationship between overall knowledge and participants characteristics in this study the results shows that there is a significant association between overall knowledge and work group ($p=0.005$) this outcome was supported by a cross-sectional study in United Arab Emirates by Al Abdouli et al., (2018) with supported that there is a significant between overall knowledge and occupation. About the relationship between overall knowledge and participants gender in present study the outcomes show that there is no significant between overall knowledge and gender, this outcome is near to a cross-sectional study's outcome in Saudi Arabia by Althobaiti & Jradi, (2019) the results show that there is no significant between overall knowledge and gender.

PART 6

CONCLUSION AND RECOMMENDATIONS

The present study shows that 382 (28.1%) of the participants were between 50 to 54 years old, 964 (70.8%) of them were male, 1224 (89.9%) were married, 545 (40%) of them have secondary school certificate. Also, 866 (63.7%) of them were employed, most of the participants had no personal history of CRC, and no chronic disease, they didn't do a general checkup. And more than half were heard about CRC screenings, more than half had information about CRCs risk factors, most of them had no family history of colorectal cancer. Near half of participants (50.7%) believed that the presence of polyp may lead to colorectal cancer. While 40.1% of study samples agreed that a family history of CRC increases the chance of getting colorectal cancer. Also, most of the participants (50.6%) agreed with the statement that smoking is one of the risk factors of CRC, and 40.3% of participants correctly agreed that alcohol consumption is a risk factor of CRC. Besides, 50.6% and 45.0% of participants believed that aging and diabetes type 2 are CRC risk factors, respectively. 32.8% of participants thought that they have a chance of getting CRC like other people, and approximately 51.8% of participants believed that early diagnosis of CRC is good. Also, it was found that 48.3% of participants afraid of the CRC screening test. While 40.9% of participants agreed that regular screening for bowel cancer increases the chance of preventing CRC. Besides, 29.6%, 35.4 of participants worried colonoscopy and sigmoidoscopy would be embarrassing and painful, respectively. In this study, it was found 4% of participants had low knowledge level, and 89.1% of had moderate knowledge, while 6.9% of participants had high knowledge level. In this study, it was determined that the knowledge about CRC was significantly greater among participants in the working status compared to other age groups ($p = 0.005$) and there were no significant differences between participants overall knowledge level and behaviors.

According to these results, we recommend that seminar, and other campaign practices should be organized to improve Iraqi people's knowledge, attitude, and health behaviors towards risk factors, signs, and symptoms of colorectal cancer.

REFERENCES

- Al-Saigh, T. H., Al-Bayati, S. A., Abdulmawjood, S. A., & Ahmed, F. A. (2019). Descriptive study of colorectal cancer. *Taha HT Al-Saigh*, 41(1), 81–85.
- Alshammari, K.F., Alghaslan, S.A., Alghassab, A.A., Alsaid, A.T.& Alharbi, T.G (2021). Awareness of colorectal cancer among general population in Hail city, Saudi Arabia. *Int J Med Res Health*, 10(3), 166-172
- Alrubaie, A., Alkhalidi, N., & Abd-Alhusain, S. (2019). A clinical study of newly-diagnosed colorectal cancer over 2 years in a gastroenterology center in Iraq. *Journal of Coloproctology*, 39(3), 217–222. <https://doi.org/10.1016/j.jcol.2019.05.010>
- Alsheridah, N., & Akhtar, S. (2018). Diet, obesity and colorectal carcinoma risk: results from a national cancer registry-based middle-eastern study. *BMC Cancer*, 18(1), 1–10. <https://doi.org/10.1186/s12885-018-5132-9>
- Alshewered, A. S., & Al-Naqqash, M. abdulelah. (2019). Rectal cancer and chemoradiation in Iraq: systematic review and meta-analysis. *Journal of Coloproctology*, 39(4), 309–318. <https://doi.org/10.1016/j.jcol.2019.06.003>
- Althobaiti, A., & Jradi, H. (2019). Knowledge, attitude, and perceived barriers regarding colorectal cancer screening practices and risk factors among medical students in Saudi Arabia. *BMC Medical Education*, 19(1), 1–8. <https://doi.org/10.1186/s12909-019-1857-7>
- Arafa, M. A., & Farhat, K. (2015). Colorectal cancer in the Arab world - Screening practices and future prospects. *Asian Pacific Journal of Cancer Prevention*, 16(17), 7425–7430. <https://doi.org/10.7314/APJCP.2015.16.17.7425>
- Arnold, M., Sierra, M. S., Laversanne, M., Soerjomataram, I., Jemal, A., & Bray, F. (2017). Global patterns and trends in colorectal cancer incidence and mortality. *Gut*, 66(4), 683–691. <https://doi.org/10.1136/gutjnl-2015-310912>
- Bardou, M., Barkun, A. N., & Martel, M. (2013). Obesity and colorectal cancer. *Gut*, 62(6), 933–947. <https://doi.org/10.1136/gutjnl-2013-304701>
- Bedi, A., Akhtar, A. J., Barber, J. P., Hamilton, S. R., Jones, R. J., Pasricha, P. J., Giardiello, F. M., Bedi, G. C., Hamilton, S. R., & Zehnbaauer, B. A. (1995). Inhibition of Apoptosis during Development of Colorectal Cancer. *Cancer Research*, 55(9), 1811–1816.
- Benito, L., Binefa, G., Lluch, T., Vidal, C., Milà, N., Puig, M., Roldán, J., & Garcia, M. (2014). Defining the role of the nurse in population-based cancer screening programs: A literature review. *Clinical Journal of Oncology Nursing*, 18(4). <https://doi.org/10.1188/14.CJON.E77-E83>
- Berg, M., & Søreide, K. (2011). Genetic and epigenetic traits as biomarkers in colorectal cancer. *International Journal of Molecular Sciences*, 12(12), 9426–9439. <https://doi.org/10.3390/ijms12129426>
- Bretthauer, M. (2011). Colorectal cancer screening. *Journal of Internal Medicine*, 270(2), 87–98. <https://doi.org/10.1111/j.1365-2796.2011.02399.x>
- Byers, T., Levin, B., Rothenberger, D., Dodd, G. D., & Smith, R. A. (1997). American Cancer Society guidelines for screening and surveillance for early detection of colorectal polyps and cancer: update 1997. American Cancer Society Detection and

- Treatment Advisory Group on Colorectal Cancer. *CA: A Cancer Journal for Clinicians*, 47(3), 154–160. <https://doi.org/10.3322/canjclin.47.3.154>
- Centelles, J. J. (2012). General Aspects of Colorectal Cancer. *ISRN Oncology*, 2012, 1–19. <https://doi.org/10.5402/2012/139268>
- Center, M. M., Jemal, A., Smith, R. A., & Ward, E. (2009). Worldwide variations in colorectal cancer. *Diseases of the Colon and Rectum*, 59(7), 366–378. <https://doi.org/10.1007/DCR.0b013e3181d60a51>
- Chan, A. T., & Giovannucci, E. L. (2010). Primary Prevention of Colorectal Cancer. *Gastroenterology*, 138(6), 2029–2043.e10. <https://doi.org/10.1053/j.gastro.2010.01.057>
- Chiu, H. M., Hsu, W. F., Chang, L. C., & Wu, M. H. (2017). Colorectal Cancer Screening in Asia. *Current Gastroenterology Reports*, 19(10). <https://doi.org/10.1007/s11894-017-0587-4>
- Dolan, N. C., Ferreira, M. R., Davis, T. C., Fitzgibbon, M. L., Rademaker, A., Liu, D., Schmitt, B. P., Gorby, N., Wolf, M., & Bennett, C. L. (2004). Colorectal cancer screening knowledge, attitudes, and beliefs among veterans: Does literacy make a difference? *Journal of Clinical Oncology*, 22(13), 2617–2622. <https://doi.org/10.1200/JCO.2004.10.149>
- Dyson, J. K., & Rutter, M. D. (2012). Colorectal cancer in inflammatory bowel disease: What is the real magnitude of the risk? *World Journal of Gastroenterology*, 18(29), 3839–3848. <https://doi.org/10.3748/wjg.v18.i29.3839>
- Federici, A., Rossi, P. G., Borgia, P., Bartolozzi, F., Farchi, S., & Gausticchi, G. (2005). The immunochemical faecal occult blood test leads to higher compliance than the guaiac for colorectal cancer screening programmes: A cluster randomized controlled trial. *Journal of Medical Screening*, 12(2), 83–88. <https://doi.org/10.1258/0969141053908357>
- Gimeno Garcia, A. Z., Hernandez Alvarez Buylla, N., Nicolas-Perez, D., & Quintero, E. (2014). Public Awareness of Colorectal Cancer Screening: Knowledge, Attitudes, and Interventions for Increasing Screening Uptake. *ISRN Oncology*, 2014, 1–19. <https://doi.org/10.1155/2014/425787>
- Giovannucci, E. (2003). Diet, body weight, and colorectal cancer: A summary of the epidemiologic evidence. *Journal of Women's Health*, 12(2), 173–182. <https://doi.org/10.1089/154099903321576574>
- Haggar, F. A., & Boushey, R. P. (2009). Colorectal cancer epidemiology: Incidence, mortality, survival, and risk factors. *Clinics in Colon and Rectal Surgery*, 22(4), 191–197. <https://doi.org/10.1055/s-0029-1242458>
- Hakama, M., Hoff, G., Kronborg, O., & Pahlman, L. (2005). Screening for colorectal cancer. *Acta Oncologica*, 44(5), 425–439. <https://doi.org/10.1080/02841860510029969>
- Harewood, G. C., & Lieberman, D. A. (2004). Colonoscopy practice patterns since introduction of medicare coverage for average-risk screening. *Clinical Gastroenterology and Hepatology*, 2(1), 72–77. [https://doi.org/10.1016/S1542-3565\(03\)00294-5](https://doi.org/10.1016/S1542-3565(03)00294-5)
- Hawk, E. T., & Levin, B. (2005). Colorectal cancer prevention. *Journal of Clinical Oncology*, 23(2), 378–391. <https://doi.org/10.1200/JCO.2005.08.097>

- Jillson, I., Faeq, Z., Kabbara, K. W., Cousin, C., Mumford, W., & Blancato, J. (2015). Knowledge and Practice of Colorectal Screening in a Suburban Group of Iraqi American Women. *Journal of Cancer Education*, 30(2), 284–293. <https://doi.org/10.1007/s13187-015-0813-4>
- Katz, M. L., James, A. S., Pignone, M. P., Hudson, M. A., Jackson, E., Oates, V., & Campbell, M. K. (2004). Colorectal cancer screening among African American church members: A qualitative and quantitative study of patient-provider communication. *BMC Public Health*, 4, 1–8. <https://doi.org/10.1186/1471-2458-4-62>
- Kolligs, F. T. (2016). Diagnostics and epidemiology of colorectal cancer. *Visceral Medicine*, 32(3), 158–164. <https://doi.org/10.1159/000446488>
- Koornstra, J. J., De Jong, S., Hollema, H., De Vries, E. G. E., & Kleibeuker, J. H. (2003). Changes in apoptosis during the development of colorectal cancer: A systematic review of the literature. *Critical Reviews in Oncology/Hematology*, 45(1), 37–53. [https://doi.org/10.1016/S1040-8428\(01\)00228-1](https://doi.org/10.1016/S1040-8428(01)00228-1)
- Kuipers, E. J., Grady, W. M., Lieberman, D., Seufferlein, T., Sung, J. J., Boelens, P. G., Van De Velde, C. J. H., & Watanabe, T. (2015). Colorectal cancer. *Nature Reviews Disease Primers*, 1, 1–25. <https://doi.org/10.1038/nrdp.2015.65>
- Levin, B., Lieberman, D. A., McFarland, B., Andrews, K. S., Brooks, D., Bond, J., Dash, C., Giardiello, F. M., Glick, S., Johnson, D., Johnson, C. D., Levin, T. R., Pickhardt, P. J., Rex, D. K., Smith, R. A., Thorson, A., & Winawer, S. J. (2008). Screening and Surveillance for the Early Detection of Colorectal Cancer and Adenomatous Polyps, 2008: A Joint Guideline From the American Cancer Society, the US Multi-Society Task Force on Colorectal Cancer, and the American College of Radiology. *Gastroenterology*, 134(5), 1570–1595. <https://doi.org/10.1053/j.gastro.2008.02.002>
- López-Abente, G., Ardanaz, E., Torrella-Ramos, A., Mateos, A., Delgado-Sanz, C., Chirlaque, M. D., Sánchez, M. J., Saladié, F., Sánchez-González, S. C., Buxó, M., Ramos, M., Llano, J., Martos, C., Alemán, A., & Perucha, J. (2010). Changes in colorectal cancer incidence and mortality trends in Spain. *Annals of Oncology*, 21(SUPPL.3). <https://doi.org/10.1093/annonc/mdq091>
- Mármol, I., Sánchez-de-Diego, C., Dieste, A. P., Cerrada, E., & Yoldi, M. J. R. (2017). Colorectal carcinoma: A general overview and future perspectives in colorectal cancer. *International Journal of Molecular Sciences*, 18(1). <https://doi.org/10.3390/ijms18010197>
- McGarragle, K. M., Hare, C., Holter, S., Facey, D. A., McShane, K., Gallinger, S., & Hart, T. L. (2019). Examining intrafamilial communication of colorectal cancer risk status to family members and kin responses to colonoscopy: A qualitative study. *Hereditary Cancer in Clinical Practice*, 17(1), 1–13. <https://doi.org/10.1186/s13053-019-0114-8>
- Molokwu, J. C., Shokar, N., & Dwivedi, A. (2017). Impact of Targeted Education on Colorectal Cancer Screening Knowledge and Psychosocial Attitudes in a Predominantly Hispanic Population. *Family and Community Health*, 40(4), 298–305. <https://doi.org/10.1097/FCH.0000000000000165>
- Nasrallah, A., & El-Sibai, M. (2014). Colorectal cancer causes and treatments: A minireview. *Open Colorectal Cancer Journal*, 7(1), 1–4. <https://doi.org/10.2174/1876820201407010001>

- Ng, S. C., & Wong, S. H. (2013). Colorectal cancer screening in Asia. *British Medical Bulletin*, 105(1), 29–42. <https://doi.org/10.1093/bmb/lds040>
- O’Connell, J. B., Maggard, M. A., Livingston, E. H., & Yo, C. K. (2004). Colorectal cancer in the young. *American Journal of Surgery*, 187(3), 343–348. <https://doi.org/10.1016/j.amjsurg.2003.12.020>
- Otte, D. M. (1988). Nursing management of the patient with colon and rectal cancer. *Seminars in Oncology Nursing*, 4(4), 285–292. [https://doi.org/10.1016/0749-2081\(88\)90080-0](https://doi.org/10.1016/0749-2081(88)90080-0)
- Potter, J. D. (1999). Colorectal cancer: Molecules and populations. *Journal of the National Cancer Institute*, 91(11), 916–932. <https://doi.org/10.1093/jnci/91.11.916>
- Rawla, P., Sunkara, T., & Barsouk, A. (2019). Epidemiology of colorectal cancer: Incidence, mortality, survival, and risk factors. *Przegląd Gastroenterologiczny*, 14(2), 89–103. <https://doi.org/10.5114/pg.2018.81072>
- Robb, K. A., Solarin, I., Power, E., Atkin, W., & Wardle, J. (2008). Attitudes to colorectal cancer screening among ethnic minority groups in the UK. *BMC Public Health*, 8, 1–11. <https://doi.org/10.1186/1471-2458-8-34>
- Simon, K. (2016). Colorectal cancer development and advances in screening. *Clinical Interventions in Aging*, 11, 967–976. <https://doi.org/10.2147/CIA.S109285>
- Sindhu, CK., Nijar, AK., & Kwa, SK. (2019). Awareness of Colorectal Cancer among the Urban Population in the Klang Valley. *Malaysian Family Physician*, 14(3);18–27.
- Stein, C. J., & Colditz, G. A. (2004). Modifiable risk factors for cancer. *British Journal of Cancer*, 90(2), 299–303. <https://doi.org/10.1038/sj.bjc.6601509>
- Stintzing, S. (2014). Management of colorectal cancer. *F1000Prime Reports*, 6(November). <https://doi.org/10.12703/P6-108>
- Świdarska, M., Choromańska, B., Dąbrowska, E., Konarzewska-Duchnowska, E., Choromańska, K., Szczurko, G., Myśliwiec, P., Dadan, J., Ładny, J. R., & Zwierz, K. (2014). The diagnostics of colorectal cancer. *Współczesna Onkologia*, 18(1), 1–6. <https://doi.org/10.5114/wo.2013.39995>
- Tabernero, J., Cervantes, A., Rivera, F., Martinelli, E., Rojo, F., Von Heydebreck, A., Macarulla, T., Rodriguez-Braun, E., Vega-Villegas, M. E., Senger, S., Ramos, F. J., Roselló, S., Celik, I., Stroh, C., Baselga, J., & Ciardiello, F. (2010). Pharmacogenomic and pharmacoproteomic studies of cetuximab in metastatic colorectal cancer: Biomarker analysis of a phase I dose-escalation study. *Journal of Clinical Oncology*, 28(7), 1181–1189. <https://doi.org/10.1200/JCO.2009.22.6043>
- Wheeler, A. (2014). The modern role of the clinical nurse specialist in colorectal cancer in a district general hospital. *Current Colorectal Cancer Reports*, 10(2), 140–146. <https://doi.org/10.1007/s11888-014-0211-z>
- Woudstra, A. J., Dekker, E., Essink-Bot, M. L., & Suurmond, J. (2016). Knowledge, attitudes and beliefs regarding colorectal cancer screening among ethnic minority groups in the Netherlands – a qualitative study. *Health Expectations*, 19(6), 1312–1323. <https://doi.org/10.1111/hex.12428>
- Xie, Y. H., Chen, Y. X., & Fang, J. Y. (2020). Comprehensive review of targeted therapy for colorectal cancer. *Signal Transduction and Targeted Therapy*, 5(1). <https://doi.org/10.1038/s41392-020-0116-z>

- Yoshihara, M., Hiyama, T., & Tanaka, S. (2007). Epidemiology of colorectal cancer. *Nihon Naika Gakkai Zasshi. The Journal of the Japanese Society of Internal Medicine*, 96(2), 200–206. <https://doi.org/10.2169/naika.96.200>
- Zavoral, M., Suchanek, S., Zavada, F., Dusek, L., Muzik, J., Seifert, B., & Fric, P. (2009). Colorectal cancer screening in Europe. *World Journal of Gastroenterology*, 15(47), 5907–5915. <https://doi.org/10.3748/wjg.15.5907>
- Anderson, A. S., Caswell, S., Wells, M., & Steele, R. J. C. (2013). Obesity and lifestyle advice in colorectal cancer survivors - how well are clinicians prepared? *Colorectal Disease*, 15(8), 949–957. <https://doi.org/10.1111/codi.12203>
- Corner, J. (2003). The role of nurse-led care in cancer management. *Lancet Oncology*, 4(10), 631–636. [https://doi.org/10.1016/S1470-2045\(03\)01223-3](https://doi.org/10.1016/S1470-2045(03)01223-3)
- Cotterchio, M., Manno, M., Klar, N., McLaughlin, J., & Gallinger, S. (2005). Colorectal screening is associated with reduced colorectal cancer risk: A case-control study within the population-based ontario familial colorectal cancer registry. *Cancer Causes and Control*, 16(7), 865–875. <https://doi.org/10.1007/s10552-005-2370-3>
- Etzioni, D. A., Yano, E. M., Rubenstein, L. V., Lee, M. L., Ko, C. Y., Brook, R. H., Parkerton, P. H., & Asch, S. M. (2006). Measuring the quality of colorectal cancer screening: The importance of follow-up. *Diseases of the Colon and Rectum*, 49(7), 1002–1010. <https://doi.org/10.1007/s10350-006-0533-2>
- Fitzgerald-Smith, A. M., Srivastava, P., & Hershman, M. J. (2003). The role of the nurse in colorectal cancer follow up. *Hospital Medicine*, 64(6), 344–347. <https://doi.org/10.12968/hosp.2003.64.6.344>
- Fritzell, K., Stake Nilsson, K., Jervaeus, A., Hultcrantz, R., & Wengström, Y. (2017). The importance of people's values and preferences for colorectal cancer screening participation. *European Journal of Public Health*, 27(6), 1079–1084. <https://doi.org/10.1093/eurpub/ckw266>
- Imaeda, A., Bender, D., & Fraenkel, L. (2010). What is most important to patients when deciding about colorectal screening? *Journal of General Internal Medicine*, 25(7), 688–693. <https://doi.org/10.1007/s11606-010-1318-9>
- Jones, R. M., Woolf, S. H., Cunningham, T. D., Johnson, R. E., Krist, A. H., Rothenich, S. F., & Vernon, S. W. (2010). The Relative Importance of Patient-Reported Barriers to Colorectal Cancer Screening. *American Journal of Preventive Medicine*, 38(5), 499–507. <https://doi.org/10.1016/j.amepre.2010.01.020>
- Knowles, G., Sherwood, L., Dunlop, M. G., Dean, G., Jodrell, D., McLean, C., & Preston, E. (2007). Developing and piloting a nurse-led model of follow-up in the multidisciplinary management of colorectal cancer. *European Journal of Oncology Nursing*, 11(3), 212–223. <https://doi.org/10.1016/j.ejon.2006.10.007>
- Loftus, L. A., & Weston, V. (2001). The development of nurse-led clinics in cancer care. *Journal of Clinical Nursing*, 10(2), 215–220. <https://doi.org/10.1111/j.1365-2702.2001.00488.x>
- Ramji, F., Cotterchio, M., Manno, M., Rabeneck, L., & Gallinger, S. (2005). Association between subject factors and colorectal cancer screening participation in Ontario, Canada. *Cancer Detection and Prevention*, 29(3), 221–226. <https://doi.org/10.1016/j.cdp.2005.04.001>

- Taylor, C., Mackay, L., Dawson, C., & Richards, N. (2019). Significant polyp and early colorectal cancer – SPECC: The role of the Colorectal Cancer Clinical Nurse Specialist (CNS): promoting patient-centred care. *Colorectal Disease*, 21, 32–36. <https://doi.org/10.1111/codi.14501>
- Taylor, V., Lessler, D., Mertens, K., Tu, S. P., Hart, A., Chan, N., Shu, J., & Thompson, B. (2003). Colorectal cancer screening among African Americans: The importance of physician recommendation. *Journal of the National Medical Association*, 95(9), 806–812.

APPENDIX 1.



**T.C.
KARABÜK ÜNİVERSİTESİ
GİRİŞİMSSEL OLMAYAN KLİNİK ARAŞTIRMALAR
ETİK KURULU**

16/10/2020

Karar No: 2020/289

Sayın Doç. Dr. Işıl IŞIK ANDSOY

Girişimsel Olmayan Klinik Araştırmalar Etik Kurulumuza sunmuş olduğunuz "İraklı Bireylerin Kolorektal Kansere, Risk Faktörleri Ve Taramaya Yönelik Bilgileri, Tutum Ve Uygulamalarının İncelenmesi" başlıklı araştırma projeniz amaç, gerekçe, yaklaşım ve yöntemle ilgili açıklamaları açısından Girişimsel Olmayan Etik Kurulu yönergesine göre incelenmiştir. Etik açıdan bir sakınca olmadığına oy birliği ile karar verilmiş ve uygun görülmüştür. Bilgilerinize rica ederim.

Prof. Dr. Orhan ÖNALAN
Girişimsel Olmayan Klinik Araştırmalar Etik Kurulu Başkanı

Ekler:

1-Kurul Üyeleri Değerlendirme Formları

APPENDIX 2.

**Bestun Center for Legal Translation
of All Languages**
Authorized by Judicial Council - Presidency of
Al-Sulaimaniya Area Court of Appeal
Address: Al-Sulaimaniya/ Piramard Street
E-mail: Bestun fo@gmail.com Phone No.: +964 (0) 750 103 0097 / +964 (0) 772 532 5004 / +964 (0) 770 862 8656

مركز بيسلون لترجمة القانونية كافة اللغات
مجاز من قبل مجلس القضاء - رئاسة محكمة استئناف منطقة السليمانية
العنوان: السليمانية - شارع پيرامرد

Kurdistan Region - Iraq
Council of Ministers
Ministry of Health
Sulaimany General Directorate of Health
Personnel

No.: 5638
Date: 15-07-2020

To: Shaheed Peshraw Public Hospital
Subject: Assistance Letter

We are kindly asking you offer assistance to BURHAN FARIQ MOHAMMED KARIM titled "University Nurse" when paying you a visit for getting information for his research.

➤ Signed by Twana Arif Raheem, Manager of Administration on 15-07-2020
➤ Sealed by Sulaimany General Directorate of Health, Department of Outbound Letters

A copy to:
➤ Personnel/ Abdullah/ With the Paperwork
➤ Private Dossier

APPENDIX 3.

QUESTIONNAIRE FORM

Knowledge, Attitudes and Health Behaviors towards colorectal cancer among IRAQI people

Survey

Dear participant, below are some statements regarding the Colorectal cancer. In the questions, there is no wrong or correct answer. There for read each statement and mark the answer that suits you. Be careful to leave no questions as empty as possible. Thanks for your support.

Part 1` : Descriptive Characteristics of the participants.

1. Age Years
2. Gender	1. Male () 2. Female ()
3. Marital status	1. Married () 2. Single () 3. Divorced ()
4. Education	1. No formal education () 2. Primary school () 3. Secondary school () 4. High school () 5. College/University and above ()
5. Working status	1. . Unemployment 2. Government employee () 3. Self-employed () 4. Retired () 5 Homeworker ()
6. Do you have any history of colorectal cancer?	Yes () No ()
7. Do you have any chronic disease?	1. Yes () 2. No ()
8. Have you ever had a general health check-up?	1. Yes () 2. No ()
9. Did you have information about colorectal cancer and risk factors?	1. Yes () 2. No ()
10. Have you heard any screening tests to find colon or rectal cancer?	Yes () No()
11. Do you have family history of colorectal cancer?	Yes () No () if yes who?

Part 2: Knowledge Regarding Risk Factors of colorectal cancer

Risk factor	Yes	No	I don't
1. Presence of colon polyps can lead to colorectal cancer			
2. Family history of colorectal cancer is one of risk factor of the colorectal cancer			
3. Smoking is a risk factor for colorectal cancer.			
4. People who are overweight are at a higher risk of getting colorectal cancer			
5. Inflammatory bowel disease may be increasing the colorectal cancer risk			
6. Physical activity less than 30 minute a day is a risk factor of colorectal cancer (CRC)			
7. Low protein, fiber diet and low intake of fruit and vegetable is risk factor for colorectal cancer			
8. Consumptions of alcohol lead to colorectal cancer			
9. Stress is a risk for colorectal cancer			
10. Older age increase risk of colorectal cancer			
11. Type 2 diabetes mellitus may increase colorectal cancer			
12. Consumption of red or processed meat may lead to colorectal cancer			
Symptoms	Yes	No	I don't
1. Any change in bowel habit (constipation, diarrhea) may a symptom of colorectal cancer			
2. Lower abdominal pain may be due to colorectal cancer			
3. Rectal bleeding is pone of colorectal cancer symptom			
4. Loss of weight may be one of the colorectal cancer symptoms			
5. Fatigue loss of appetite may a symptom of colorectal cancer			
6. Blood in stool may be due to colorectal cancer			
7. Anal pain may a symptom of colorectal cancer			
8. Lower back pain may be due to colorectal cancer			
9. Lump in the abdomen during bowel empty may be one of colorectal cancer symptom			
Screening	Yes	No	I don't
1. Colorectal cancer screening test is a good method of finding cancer early			
2. Regular screening for preventing colorectal cancer is crucial			
3. Fecal Occult Blood Test, Sigmoidoscopy and colonoscopy are tests for colorectal cancer			
4. Screening for colorectal cancer should start at age 50 even if you don't have symptoms.			
5. Fecal Occult Blood Test (FOBT) should be done yearly after age 50.			
6. Sigmoidoscopy should be done every 5 years after age 50			
7. Colonoscopy should be done every 10 years after age 50			

Part 3: Health behaviors and colorectal cancer screening status

Tobacco use (current/past)	
1- Do you currently smoke any tobacco products, such as cigars or pipes?	1. Yes.... if Yes of cigarette...../day 2. No ()
2- In the past, did you ever smoke any tobacco products?	1. Yes () 2. No ()
Alcohol Consumption	
3- Do you drink any kind of alcohol like beer, wine, spirits?	1. Yes () 2. No ()
4- How frequently, do you consume alcohol	1. Daily. 2. weekly 3. Monthly
Diet	
5- Do you eat fatty meal	1. Yes () 2. No ()
6- Are you eating red meat every day?	1. No () 2. Yes ()
7- Are you having a diet low in fiber?	1. No () 2. Yes ()
8- Do you drink enough water	1. No () 2. Yes ()
9- Do you have regular bowel movements	1. No () 2. Yes ()
Physical Activity	
10- Do you do regular exercise?	1. Sometimes ()
11- Have you taken an enough rest and sleeping	1. No () 2. Yes ()
Colorectal cancer screening	
12- Have you done before fecal occult test before?	1. No () 2. Yes ()if yes when 0- () 3-5 years ()
13- Have you done before colonoscopy?	1. No () 2. Yes ()if yes when 0- () 3-5 years ()
14- Have you done before sigmoidoscopy?	1. No () 2. Yes ()if yes when 0- () 3-5 years ()

Part 4: Attitudes toward colorectal cancer

Do you agree or disagree with the following statements?	Yes	No	I don't know
1. I think my risk of getting cancer is about the same as everyone else			
2. It is better to detect colorectal cancer early through screening than discover it later.			
3. I am afraid of getting colon screening tests			
4. There are so many different recommendations about preventing colorectal cancer that it's hard to know which ones to follow.			
5. I am reluctant to get checked for colorectal cancer because you fear you may have it.			
6. Getting checked regularly for colorectal cancer increases the chances of preventing the colorectal cancer.			
7. I am reluctant to get checked for colorectal cancer because the test is embarrassing			
8. I believe that I am at risk of getting bowel cancer			
9. I don't want to change my lifestyle (activity, smoking, alcohol)			
10. I am worried flexible sigmoidoscopy would be embarrassing			
11. I am worried flexible sigmoidoscopy would be painful			

APPENDIX D.
QUESTIONNAIRE IN ARABIC

استبيان

عزيزي المشارك ، فيما يلي بعض العبارات المتعلقة بسرطان القولون والمستقيم. في الأسئلة ، لا توجد إجابة خاطئة أو صحيحة. هناك لقراءة كل بيان ووضع علامة على الإجابة التي تناسبك. احرص على عدم ترك أي أسئلة فارغة قدر الإمكان. شكرا لدعمك.

الجزء الأول : الخصائص الوصفية للمشاركين.

1- العمرسنوات
2- الجنس	(1- ذكر) (2- أنثى) ()
3- الحالة الاجتماعية	(1- متزوج) (2- أعزب) (3- مطلق) ()
4- مستوى التعليم	1- تعليم غير الرسمي (2- مدرسة ابتدائية (3- مدرسة ثانوية (4- الإعدادية 5- كلية / جامعة وما فوقها)
5- حالة العمل	1- البطالة 2- موظف حكومي (3- صاحب عمل حر (4- متقاعد () 5- عامل منزلي()
6- هل لديك تاريخ من الإصابة بسرطان القولون والمستقيم؟	(نعم) (لا) ()
7- هل تعاني من أي مرض مزمن؟	(نعم) (لا) ()
8- هل سبق لك إجراء فحص طبي عام؟	(نعم) (لا) ()
9- هل لديك معلومات عن سرطان القولون والمستقيم وعوامل الخطر؟	(نعم) (لا) ()
10- هل سمعت أي اختبارات فحص للكشف عن سرطان القولون أو المستقيم؟	(نعم) (لا) ()
11- هل لديك تاريخ عائلي للإصابة بسرطان القولون والمستقيم؟	(نعم) (لا) () إذا كانت الإجابة بنعم من؟

الجزء 2: معرفة عوامل الخطر لسرطان القولون والمستقيم

عامل الخطر	نعم	لا	لا اعرف
1- يمكن أن يؤدي وجود سلائل القولون إلى سرطان القولون والمستقيم			
2- التاريخ العائلي للإصابة بسرطان القولون والمستقيم هو أحد عوامل الخطر للإصابة بسرطان القولون والمستقيم			
3- التدخين عامل خطر للإصابة بسرطان القولون والمستقيم.			
4- الأشخاص الذين يعانون من زيادة الوزن هم أكثر عرضة للإصابة بسرطان القولون والمستقيم			
5- مرض التهاب الأمعاء قد يزيد من مخاطر الإصابة بسرطان القولون والمستقيم			
6- النشاط البدني أقل من 30 دقيقة في اليوم هو عامل خطر للإصابة بسرطان القولون والمستقيم(CRC)			
7- قلة البروتين ، والنظام الغذائي بالألياف ، وقلة تناول الفاكهة والخضروات هي عامل خطر للإصابة بسرطان القولون والمستقيم			
8- استهلاك الكحول يؤدي إلى الإصابة بسرطان القولون والمستقيم			
9- الإجهاد هو عامل خطر للإصابة بسرطان القولون والمستقيم			
10- التقدم في السن يزيد من مخاطر الإصابة بسرطان القولون والمستقيم			
11- داء السكري من النوع 2 قد يزيد من سرطان القولون والمستقيم			
12- استهلاك اللحوم الحمراء أو المصنعة قد يؤدي إلى الإصابة بسرطان القولون والمستقيم			

اعراض	نعم	لا	لا اعرف
1- أي تغيير في عادة الأمعاء (إمساك ، إسهال) قد يكون من أعراض سرطان القولون والمستقيم			
2- آلام أسفل البطن قد تكون ناجمة عن سرطان القولون والمستقيم			
3- نزيف المستقيم هو أحد أعراض سرطان القولون والمستقيم			
4- فقدان الوزن قد يكون أحد أعراض سرطان القولون والمستقيم			
5- التعب وفقدان الشهية قد يكون من أعراض سرطان القولون والمستقيم			
6- دم في البراز قد يكون بسبب سرطان القولون والمستقيم			
7- ألم الشرج قد يكون من أعراض سرطان القولون والمستقيم			
8- آلام أسفل الظهر قد تكون ناجمة عن سرطان القولون والمستقيم			
9- تكثف في البطن أثناء تفرغ الأمعاء قد يكون أحد أعراض سرطان القولون والمستقيم			
تحليلات	نعم	لا	لا اعرف
1- يعد اختبار فحص سرطان القولون والمستقيم طريقة جيدة للكشف عن السرطان مبكرا			
2- الفحص المنتظم للوقاية من سرطان القولون والمستقيم أمر بالغ الأهمية			
3- فحص الدم الخفي في البراز والتنظير السيني وتنظير القولون هي اختبارات لسرطان القولون والمستقيم			
4- يجب أن يبدأ فحص سرطان القولون والمستقيم في سن الخمسين حتى لو لم تكن لديك أعراض.			
5- يجب إجراء اختبار الدم الخفي في البراز (FOBT) سنويا بعد سن الخمسين.			
6- يجب إجراء التنظير السيني كل 5 سنوات بعد سن الخمسين			
7- يجب إجراء تنظير القولون كل 10 سنوات بعد سن الخمسين			

الجزء 3: السلوكيات الصحية وحالة فحص سرطان القولون والمستقي م

استخدام التبغ (الحالي / الماضي)	نعم	لا	لا اعرف
1- هل تدخن حاليا أي من منتجات التبغ مثل السجائر ، أو الأنايبب؟	1.نعم. إذا نعم عدد السجائر... .. /.. اليوم		
2- هل سبق لك أن قمت بتدخين أي من منتجات التبغ؟	1. 2.نعم. لا()		
استهلاك الكحول			
3- هل تشرب أي نوع من الكحول مثل البيرة والنبيذ والمشروبات الروحية ؟	1.نعم () 2. لا()		
4- كم مرة تستهلك الكحول	سبوعيا 3. 3. شهريا 1.		
نظام غذائي			
5- هل تأكل وجبة دسمة	نعم () لا ()		
6- هل تأكل اللحوم الحمراء كل يوم؟	نعم () لا ()		
7- هل تتبع نظاما غذائيا قليل الألياف؟	نعم () لا ()		
8- هل تشرب كمية كافية من الماء	نعم () لا ()		
9- هل لديك حركات أمعاء منتظمة	نعم () لا ()		
النشاط البدني			
10- هل تمارس التمارين الرياضية بانتظام؟	نعم () لا () في بعض الأحيان		
11- هل تأخذ قسطا كافيا من الراحة والنوم	نعم () لا ()		
فحص سرطان القولون والمستقيم			
12- هل سبق لك إجراء اختبار البراز الخفي من قبل؟	نعم () لا () إذا كانت الإجابة بنعم 0-2 سنوات 3-5 سنوات ()		
13- هل قمت به قبل تنظير القولون ؟	نعم () لا () إذا كانت الإجابة بنعم 0-2 سنوات 3-5 سنوات ()		

14- هل قمت به قبل التنظير السيني ؟	نعم () لا () إذا كانت الإجابة بنعم 0-2 سنوات (3-5 سنوات)
------------------------------------	---

الجزء 4: المواقف تجاه سرطان القولون والمستقي م

هل توافق أو لا توافق على العبارات التالية؟	نعم	لا	لا أعرف
1- أعتقد أن مخاطر إصابتي بالسرطان هي نفسها تقريبا مثل أي شخص آخر			
2- الكشف المبكر عن سرطان القولون والمستقيم عن طريق الفحص أفضل من اكتشافه لاحقا.			
3- أخشى إجراء فحوصات فحص القولون			
4- هناك العديد من التوصيات المختلفة حول الوقاية من سرطان القولون والمستقيم بحيث يصعب معرفة أي منها يجب اتباعها.			
5- أنا متردد في إجراء فحص لسرطان القولون والمستقيم لأنك تخشى أن تكون مصابا به.			
6- إن إجراء الفحوصات الدورية لسرطان القولون والمستقيم يزيد من فرص الوقاية من سرطان القولون والمستقيم.			
7- أنا متردد في إجراء فحص لسرطان القولون والمستقيم لأن الاختبار محرج			
8- أعتقد أنني معرض لخطر الإصابة بسرطان الأمعاء			
9- لا أريد تغيير نمط حياتي (النشاط ، التدخين ، الكحول)			
10- أخشى أن يكون التنظير السيني المرن محرجا			
11- أخشى أن يكون التنظير السيني المرن مؤلم ا			

APPENDIX E.
QUESTIONNAIRE IN KURDISH

بەشدار بووى بەرئز نەمانەى خوارەوۋە ضەند ئرسيارىكن لئسەر سەرەتانى كۆلۈن ولامى دروست و نادروستى ئيايە ئرسيارەكان ھەمووى بخويئەوۋە و ھىماى لئسەر دائى ھەقۇل بەدە ھىض ئرسيارىك جىمەھىئە سوناس بۇ ھاوكارىت

بەشى يەككەم زانىارى كەسى بەشدار بوو

تەمەن	
رەطەز	ئىز () مى ()
بارى خىزانى	سەلت () خىزاندار () جىابوودەو ()
ناسنى خويئەن	نەخويئەوار () سەرەتايى () ناوئەندى () نامادەقى () زانكۇ بەرەو سەرەوۋە ()
ئىشە	بىكار () فەرمانبەر () كارى سەربەخۇ () خانە ئىشەن () كارى مائەوۋە ()
تووشى سەرەتانى كۆلۈن بوويت ئىشەر؟	بەلى () نەخىر ()
ھىض نەخوشى يەكى درىخايەنت ھەيە ؟	بەلى () نەخىر ()
ئىشەر ھىض شىكارىكى كۆلۈن كرووۋە ؟	بەلى () نەخىر ()
زانمىارىت ھەيە لئسەر سەرەتانى كۆلۈن و كۆم؟	بەلى () نەخىر ()
زانمىارىت ھەيە لئسەر ئشكىنەكانى سەرەتانى كۆلۈن و كۆم؟	بەلى () نەخىر ()
كەس لئخىزانەكەت تووشى سەرەتانى كۆلۈن و كۆم؟	بەلى () نەخىر () نەطەر بەلى ضىت نەبىت؟

بەشى دووۋەم زانىارى دەربارەى سەرەتانى كۆلۈن و كۆم

ھۆكارى ترسانكى	بەلى	نەخىر	نازانم
ئايا بوونى دوپمەى كۆلۈن ھۆكارە بۇ توشبوون بەسەرەتانى كۆلۈن؟			
تووش بوونى كەسىك لئخىزانەكەت ھۆكارە بۇ توشبوون بەسەرەتانى كۆلۈن؟			
جطەرە كىشان ھۆكارە بۇ توشبوون بەسەرەتانى كۆلۈن؟			
زىاد بوونى كىشەھۆكارە بۇ توشبوون بەسەرەتانى كۆلۈن؟			
ھەوكرەنى كۆلۈن نەطەرى تووش بوون بەسەرەتانى كۆلۈن زىاد نەكات			
بوونى جولەى كەمتر لئە 30 خولەك لئە رۇدىكدا نەطەرى تووش بوون بەسەرەتانى كۆلۈن زىاد نەكات			
كەم خوارەنى ميوە سەوزەو ئرۇئىن و نەھو خوارەنەى رىشالى ئىدايە ھۆكارە بۇ توشبوون بەسەرەتانى كۆلۈن؟			
خوارەنەە كھولى يەكان ھۆكارە بۇ توشبوون بەسەرەتانى كۆلۈن؟			
دئراوكى ھۆكارە بۇ توشبوون بەسەرەتانى كۆلۈن؟			

			بەسالا ضوون ھۆكارە بۇ توشبوون بەسەرەتانی كۆلۈن؟
			نەخۇشي شەكرە لە جۆري 2 ھۆكارە بۇ توشبوون بەسەرەتانی كۆلۈن؟
نازانم	نەخىر	بەلې	نېشانەكانى سەرەتانی كۆلۈن و كۆم
			رەنطە تېكسونى كارى رېخۇلە (سكسون و قەبىزى) نېشانەنى سەرەتانی كۆلۈن و كۆم بېت
			ھەندىجار نازار لەتەشنى خوارقوۋى سك دروست نەبېت بەھۇى سەرەتانی كۆلۈنقوۋە
			خويىن ھاتن لە كۆم نېشانەنى سەرەتانی كۆلۈنقوۋە
			دايەزىنى كېشى زور ھەندى جار نېشانەنى سەرەتانی كۆلۈنقوۋە
			ھەست كردن بەماندو بوون و نەمانى نېشەنە نېشانەنى سەرەتانی كۆلۈنقوۋە
			بوونى خويىن لەتەسايدا ھەندى جار نېشانەنى سەرەتانی كۆلۈنقوۋە
			بوونى نازار لە كۆمدا ھەندى جار نېشانەنى سەرەتانی كۆلۈنقوۋە
			بوونى نازار لە بەشنى خوارقوۋى بشت ھەندى جار نېشانەنى سەرەتانی كۆلۈنقوۋە
			بوونى نەغازات يان ئېىض ھاتن بەسكدا ھەندى جار نېشانەنى سەرەتانی كۆلۈنقوۋە
نازانم	نەخىر	بەلې	ئەشكەنەكان
			ئەنجامدانى ئەشكەنەكانى بەزىك و ئىكى رېطەقەكى باشە بۇ دەست نېشان كردنى سەرەتەن
			ئەنجامدانى ئەشكەنەكان بەشئوۋە رېكخراو ئېويستە بۇ خۇئاراستن لەسەرەتانی كۆلۈن
			ئەشكەنەكانى ناويىنى كۆلۈن و بوونى خويىنى شاراۋە لەتەسايدا بەكاردين بۇ دەست نېشان كردنى سەرەتانی كۆلۈن
			لەسەرەتەنى 50 سالقوۋە ئەشكەنەنى سەرەتانی كۆلۈن ئېويستە نەطەر ھېىض نېشانەقەكىش نەبېت
			لەئوۋى تەمەنى 50 سال ھەموو سالى ئېويستە ئەشكەنەنى FOB T بەكرېت
			لەئوۋى تەمەنى 50 سال ھەموو 5 سال جارېك ئېويستە ئەشكەنەنى sigmoidoscopy بەكرېت
			لەئوۋى تەمەنى 50 سال ھەموو 5 سال جارېك ئېويستە ئەشكەنەنى colonoscopy بەكرېت

بەشى 3 خوى تەندروستى تاك و دوخى ئەنجامدانى پشكىنەكان

	بەكار ھىيانى توتىن
بەلەي () نەخىر () نەطەر بەلەي ضەن جطرة لقرۇنىكدا	جطرة يان نىرطلة نەكيشى؟
بەلەي () نەخىر ()	نەطەر نەخىر تىشتر جطرةنت كىشاو؟
	بەكار ھىيانى كحول
بەلەي () نەخىر ()	مەي نەخوینتەو؟
رۇدانە () حەفتانە () مانطانە ()	ضەنى جارېك؟
	خۇراک
بەلەي () نەخىر ()	خواردنى ضەور نەخوى
بەلەي () نەخىر ()	طۇشتى سوور زور نەخوى؟
بەلەي () نەخىر ()	خواردنى كەم رېشال نەخوى؟
بەلەي () نەخىر ()	بري ئىويست ئاو نەخوینتەو؟
بەلەي () نەخىر ()	کردارەكانى رېخولتەت باشە؟
	جولەي رۇدانە
بەلەي () نەخىر () ھەندى جار ()	بەرىك و تىكى وەرزش نەكەي؟
بەلەي () نەخىر ()	خەوتنت باشە؟
	تشكىنەكانى سەرتەنى كۇلون
بەلەي () نەخىر () نەطەر بەلەي 2-0 سال () 3-5 سال ()	تېشتر تشكىنى خوينى شاراۋە لەئىسايدا F O B T كىردوۋە؟
بەلەي () نەخىر () نەطەر بەلەي 2-0 سال () 3-5 سال ()	تېشتر تشكىنى ناوبىنى كۇلونت كىردوۋە؟
بەلەي () نەخىر () نەطەر بەلەي 2-0 سال () 3-5 سال ()	تېشتر تشكىنى Sigmoidoscopy كىردوۋە؟

بەشى 4 بۇضوون بەرامبەر سەرتەنى كۇلون

بەلەي	نەخىر	نازانم	ھاۋراي لىطەنل ئەمانەي خوارقوۋە
			تېم و اية نەطەرى تووش بوونم بەسەرتەنى كۇلون وەك ھەموو كەسىكىتر و اية
			باشتر و اية سەرتەنى كۇلون دەست نېشان بىرېت لەسەرتەنى نەخۇشى يەكەۋە لەرىي تشكىنەۋە

			نەترسىم لىق نەنجامدانى تشكىنى سىرەتەنى كۆلۈن
			رېپىتە ضارە زۇرە بۇ خۇ ئاراستن كەنازانم كاميان بەكار بېنم
			دوودلم لىق نەنجامدانى تشكىنىكەنى سىرەتەنى كۆلۈن سونكە نەترسىم ئەرىنى بېت
			نەنجامدانى تشكىنىكەن بىرىك و ئىكى ھەلى خۇ ئاراستن زىاد ئەكەت
			نامەوېت تشكىنىكەنى سىرەتەنى كۆلۈن نەنجامدەم سونكە شەرم ئەكەم
			ھەست ئەكەم نرسى توش بوون بەسەرتەنى كۆلۈن روو بىرووم ئەببەتە
			شىوازى دىانم ناطۇرم بۇ خۇئاراستن لىسەرتەنى كۆلۈن (وئەك واز ھىنان لىقچىتە)
			دوودلم لىقەنى ناوبېنى كولىسون و sigmoidoscope بىزاركەر بېت
			دوودلم لىقەنى ناوبېنى كولىسون و sigmoidoscope ئازارى بېت

RESUME

Burhan Fariq Mohammed TALABANI completed his primary and secondary education in Chamchamal City. After completing his high school education in Sheikh Raza in the same city, he started his undergraduate program at Chamchamal Technical Institute in 2000 and after that at University Sulaimani Nursing Department in 2008. After successfully graduating from the department of Nursing in 2012, he started to work as a Nurse at Basara General Hospital in Shorsh town in the same year. In 2019, he started his master's program in the Department of Nursing of the Graduate Education Institute of Karabuk University.