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The Potential of Malnutrition among Colorectal Cancer Adult Patients; Case-Control Study

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Abstract

Malnutrition is common among cancer patients, and screening for nutritional risk can identify those at risk for malnutrition early. This study aimed to investigate the prevalence of malnutrition among individuals with CRC. This study was a retrospective case-control study with 66 adult CRC patients and 134 healthy controls. Patients were randomly selected from the outpatient clinic, Menoufia University Teaching Hospital. Researchers collected socioeconomic status, health history, anthropometric indices, and nutritional status data. The malnutrition screening tool (MST) was applied to classify participants according to their nutritional status. Results revealed that more than half of CRC patients and controls were males. Most patients (57.6%) held a secondary certificate, while most controls (37.3%) held a university degree. Most cases (74.2%) resided in rural areas, whereas most controls (61.2%) were in urban areas. Patients with CRC had significantly ($P < 0.001$) lower BMIs. Moderate appetite loss was prevalent among 71.2% of CRC patients, and 83.3% lost weight unintentionally. According to the MST, 84.9% of CRC patients were malnourished. Most respondents (65.2% and 64.9%, respectively) consume dairy products (milk and cheese) daily. Approximately 90% of whole respondents consumed at least two servings of cereal or eggs weekly. Most controls (59%) ingested at least one serving of meat (meat, fish, and poultry) daily, whereas the majority of CRC patients (69.7%) did not. The control subjects consumed more fruits and vegetables. In conclusion, more than four-fifths of CRC patients were at risk for malnutrition, and most did not consume sufficient amounts of essential foods.

Keywords: Rectum, Colon, MST, Malnourished, Diet

1. Introduction:

Cancer is a prominent cause of death worldwide ^[1,2] and has been linked to various risk factors (including genetics and the environment). Cancers of the esophagus, stomach, small intestine, colon, cervix, liver, and pancreas have complex etiologies and are impacted by both heredity and environmental factors. Many of these diseases are particularly deadly ^[3] because they either have no symptoms or hide the existence of other diseases.

Colorectal cancer (CRC) is the third most frequent cancer in men and women in the United States. The American Cancer Society estimated 45,230 new cases of colorectal cancer in the United States in 2021 ^[4].

The prevalence of CRC among young people is rising worldwide, including in the Arab world. CRC prevalence was 0.72% in Saudi Arabia, 0.78% in the United Arab Emirates, and 0.4%-14% in Egypt. 7.5 per 100,000 people in Qatar are diagnosed with CRC each year. For males in Egypt, the CIR for colon cancer was 3.1, and for rectal cancer, it was 1, whereas, for females, it was 2.3 and 0.8 ^[5].

More than a third of colorectal cancer tumors in Egypt are found in people under the age of 50. There is no genetic basis for the high occurrence in young people, and bilharziasis cannot be blamed. It is uncommon for the disease to show until a late stage, and predisposing adenomas are pretty uncommon ^[6].

Screening rates and individual behavioral changes have contributed to a steady decline in the colon and rectal cancer incidence since the mid-1980s. Because of this, cancer patients typically experience malnutrition, muscular loss, and extended hospital stays ^[7].

Cancer patients' chances of survival and making a full recovery may be diminished by malnutrition, sarcopenia, and cachexia ^[8,9]. Inappropriate eating habits and food consumption patterns significantly contribute to the onset and progression of colorectal cancer [10]. Research has shown that high-stimulant foods and fast food are among the leading causes of colorectal cancer. A lot of the patients also were not used to drinking water regularly. Cancer cachexia's catabolic and physiological impacts are among the most common causes of malnutrition and decreased physical activity ^[11].

Higher intake of red meat preserved food, artificial sweeteners, fast food, soft drinks, spicy foods, processed meat, and smoking were shown to be the most significant dietary and lifestyle CRC risk factors in a study conducted on Egyptian patients. Exercise, a calcium-rich diet, a rise in fruit and vegetable consumption (especially cruciferous vegetables), a diet high in fiber (mainly bread and juice), and a diet rich in seafood and other sea foods were found to be the most significant protective It was found ^[12].

Patients at risk of malnutrition can be identified early in the treatment process through screening for nutritional risk. Initial screenings should be done during diagnosis or hospital admission, and periodic screenings throughout therapy are recommended. According to studies, screening for malnutrition should be a standard part of caring for cancer patients. Malnutrition screening calls for a simple, brief questionnaire that is quick to administer and grade, cheap, highly sensitive, and specific. One reliable method is the malnutrition screening tool (MST) [13].

Patients at risk of malnutrition can be identified through early screening for nutritional risk. Recent research recommends that screening should occur during diagnosis or hospital admission and should be continued during therapy to refer patients for further examination if necessary [14]. There is evidence that screening for malnutrition should be a standard part of caring for cancer patients. In order to be effective, a screening method for undernutrition should be quick, simple, cheap, highly sensitive, and specific. As stated in [14], the Malnutrition screening tool (MST) is an effective method of nutritional evaluation. Although it has not been evaluated in a cancer inpatient environment [15,16], the MST has good sensitivity and specificity when applied to the general hospitalized population.

The primary aims of this research were (1) to categorize patients with CRC according to the malnutrition screening tool and (2) to investigate the dietary habits and consumption patterns of people with CRC.

2. Subjects and Methods:

2.1. Subjects:

Adult patients with colorectal cancer (CRC) were recruited using a random sampling technique at the Educational Hospital for Oncology and Nuclear Medicine, Faculty of Medicine, Menoufia University. The required sample size for the investigation was determined using the formula provided by Charan and Biswas [17] as follows:

$$\text{Sample size} = \frac{= Z_{1-\alpha/2}^2 \times P(1-P)}{d^2}$$

Where: $Z_{1-\alpha/2}$ = Is standard normal variate (at 5% type 1 error ($P < 0.05$) it is 1.96)

P = Expected proportion in population

d = Absolute error or precision

$$\text{Sample size} = \frac{1.96^2 \times 0.04(1-0.04)}{0.05^2} = 59$$

To circumvent participants' withdrawn and incomplete questionnaires and missing data, the researchers enrolled sixty-six colorectal cancer patients through random selection.

This research involved Egyptian adults with colon cancer. The study involved patients who were (1) male and female, (2) newly diagnosed adults with colorectal cancer, (3) married, widowed, or divorced, and (4) residents of the Menoufia Governorate. In contrast, patients who were (1) hospitalized, (2) using drugs that interfere with colon cancer, (3) suffering from other types of cancer, and (4) handicapped or suffering from mental disorders were excluded from the study.

2.1.3 Sampling Setting and techniques

The one-to-two approach was used in this case-control study (one person as case versus two persons as control). Colorectal cancer patients who were Egyptian adults were the target demographic. The total sample size was 200 people, divided into two groups: the case group (66 adult CRC patients) and the control group (134-person adults). Patients were randomly chosen from the Menoufia University Teaching Hospital, Faculty of Medicine, Menoufia University, Shibin El Kom, Egypt, outpatient clinic.

2.2 Methods:

2.2.1 Experimental Design

This study is a retrospective, cross-sectional, case-control study. Individuals who met the inclusion criteria were enrolled in the study and divided as follows:

Case group: 66 adults' patients with colorectal cancer (CRC).

Control group, 134 adults without any form of cancer.

2.2.2 Collection of Data

Particular forms were used to collect the following data:

2.2.2.1 Demographic data

Age, gender, degree of education, occupation, monthly income, family size, housing status, social status, and place of living were obtained.

2.2.4. History of health

Including diseases, eating disorders, disabilities, medications, hunger status, weight status, neurological and psychological injuries, self-perception of nutritional status, and patient perception of his health compared to persons of the same age. In addition, the malnutrition screening tool (MST) was utilized to classify individuals based on their nutritional status.

2.2.5 Lifestyle:

Data were collected regarding the type and duration of sports, daily physical activity, and screen time.

2.2.6 Anthropometric:

Body height (cm) was measured to the nearest 0.1 cm using a non-stretchable meter. In addition, body weight (kg) was assessed using a portable scale to within 0.1 kg. Body mass index (BMI) (kg/m²) was calculated using body height and body weight measurements. BMI was used to classify all subjects into the following categories: thinness (16.5 kg/m²), underweight (16.5-18.5 kg/m²), healthy weight (18.5-25 kg/m²), overweight (25-30 kg/m²), obesity grade II (30.5-35 kg/m²), obesity grade III (35-40 kg/m²), and morbid obesity (≥ 40 kg/m²).

2.2.7 Dietary Assessment:

The Malnutrition Screening Tool (MST) was utilized to classify subjects based on their nutritional status. The MST comprises two questions concerning recent unintentional weight loss and poor food intake due to diminished appetite. This assessment produces a score between 0 and 5, with a score of 2 suggesting an increased risk of malnutrition [18].

MST = 0 or 1 (Not at risk) consuming a healthy diet and losing little or no weight

MST = 2 or higher (at risk) for poor nutrition and recent weight loss.

2.2.9 Dietary practices:

Information on meal frequency, dairy, cereal, fruit, vegetable, meat, and drink consumption was gathered.

2.2.10 Statistical Analysis

All obtained data were statistically analyzed and displayed as frequency and percentage or mean and standard deviation (SD). Using an independent sample t-test, the significant differences between numeric variables were determined. The Chi-square test and a 95% confidence interval were operated to compare categorical variables. P less than 0.05 indicated that the data were significant.

Ethical considerations:

- Respondents participated voluntarily and were well-informed of the study's objectives and methods.
- Texts belonging to other authors used in any portion of this work were cited in full.
- The questionnaires did not contain any derogatory, discriminatory, or other improper languages that could offend any participants.

- No private or personal questions were included in the questionnaire, designed to collect data relevant to the study questions.
- Subjects who refused to sign the consent form were excluded from the study.
- The Department of Nutrition and Food Sciences in the Faculty of Home Economics at Menoufia University, Egypt, approved this research.

3. Results:

According to Table 1, the majority of the CRC patients and control individuals (54.5% and 53.7%, respectively) were males. Regarding education, the majority of patients (57.6%) had a secondary certificate, while the majority of the control group (37.3%) had a university certification. As for employment, most of the patients (78.8%) had no job, whereas most control groups (39.6%) were government employees. Concerning family size, about three-fourths of case and control participants (74.2% and 79.1%, respectively) had 4 to 6 members. In terms of socioeconomic standing, the majority of the study individuals (95.5% and 96.5%, respectively) were married. Finally, the majority of cases (74.2%) lived in rural areas; on the contrary, the majority of the control group (61.2%) lived in urban areas.

Table 1. Frequency distribution for studied subjects according to socioeconomic status

	Case		Control		Chi2 test	
	no	%	no	%	Value	Sig
Gender						
Male	36	54.5%	72	53.7%	0.1	0.914
Female	30	45.5%	62	46.3%		
Total	66	100%	134	100%		
Education level						
Illiterate	13	19.7%	8	6.0%	28.1	0.000***
Primary	6	9.1%	9	6.7%		
Secondary	38	57.6%	50	37.3%		
University	9	13.6%	61	45.5%		
Post grade	0	0%	6	4.5%		
Total	66	100%	134	100%		
Job						
Jobless or retired	57	81.8%	8	6.0%	149.4	0.000***
Free business	1	1.5%	3	2.2%		
Employee	2	3.0%	54	41.3%		

	Case		Control		Chi2 test	
	no	%	no	%	Value	Sig
Teacher	1	1.5%	41	30.6%		
Security, worker, and farmer	2	3.0%	14	10.4%		
Engineer	1	1.5%	1	0.7%		
Professor	2	3.0%	12	9.0%		
Total	66	100%	134	100%		
Family size						
< 4 person	10	15.2%	21	15.7%	1.9	0.373
4 to 6	49	74.2%	106	79.1%		
> 6	7	10.6%	7	5.2%		
Total	66	100%	134	100%		
Social status						
Married	63	95.5%	129	96.5%	0.8	0.669
Single	0	0%	1	1%		
Widowed	3	4.5%	4	4%		
Total	66	100%	134	100%		
Residency						
Urban	17	25.8%	82	61.2%	22.2	0.000***
Rural	49	74.2%	52	38.8%		
Total	100	100%	134	100%		

*** $P < 0.001$

Table 2 indicates that most case and control subjects do not participate in sports (98.5% and 90.3%, respectively). Most case and control patients have sedentary or light-exercise employment (89.4% and 92.2%, respectively) when it comes to workouts at work. However, most case and control participants do nothing in their spare time (87.9% and 52.2%, respectively).

Table 2: Frequency distribution for studied subjects according to physical activities

	Case		Control		Chi ² test	
	no	%	no	%	Value	Sig
Practice sport						
don't exercise	66	100%	121	90.3	0.1	6.848
Walking sport	0	0%	10	7.4		
Weightlifting sport	0	0%	2	1.5%		
Swimming sport	0	0%	1	0.7%		
Total	66	100%	134	100%		

	Case		Control		Chi ² test	
	no	%	no	%	Value	Sig
Your job includes physical exercise						
Yes	7	10.6%	9	6.0%	0.3	2.30
No	59	89.4%	125	92.5%		
Total	66	100%	134	100%		
Spare time activities						
Nothing	58	87.9%	70	52.2%	25.4	0.000***
Watching TV	4	6.1%	21	15.7%		
Sewing	0	0%	11	8.2%		
Reading	2	3.0%	11	8.2%		
Farming plants	1	1.5%	9	6.7%		
Housework	1	1.5%	11	8.2%		
Total	66	100%	134	100%		

*** $P < 0.001$

Table 3 demonstrates that the mean age of males and females with colorectal cancer was significantly ($P=0.003$) higher than that of males and females in the control group (53.0 ± 11.3 and 56.3 ± 12.6 years vs. 48.0 ± 8.2 and 48.2 ± 8.9 years, respectively). Concerning body height, the mean value of CRC males was significantly ($P=0.030$) less than that of the control group (168.8 ± 7.6 cm vs. 172.4 ± 8.2 cm, respectively). While the mean height of CRC and control females was identical (160.0 cm). In addition, the mean weight of males and females with CRC was significantly ($P=0.001$) lower than that of males and females in the control group (69.9 ± 11.5 kg and 71.6 ± 13.6 kg vs. 86.0 ± 13.3 kg and 81.7 ± 13.6 kg, respectively). Males and females with CRC had significantly ($P < 0.001$) lower mean BMIs than those in the control group (24.5 ± 3.9 and 28.0 ± 5.5 kg/m² versus 28.9 ± 4.1 and 31.7 ± 4.9 kg/m², respectively).

Table 3 : Anthropometric measurements of patients and control groups.

		Case		Control		t-test	
		Mean	±SD	Mean	±SD	t.value	Sig.
Age (year)	Male	53.0	±11.3	48.0	±8.2	3.1	0.003**
	Female	56.3	±12.6	48.2	±8.9	2.3	0.022*
Height (cm)	Male	168.8	±7.6	172.4	±8.2	-2.2	0.030*
	Female	160.0	±5.5	160.4	±6.3	-0.2	0.766
weight (kg)	Male	69.9	±11.5	86.0	±13.3	-3.3	0.001***
	Female	71.6	±13.6	81.7	±13.3	-6.2	0.000***

body mass index (kg/m ²)	Male	24.5	±3.9	28.9	±4.1	-3.2	0.001***
	Female	28.0	±5.5	31.7	±4.9	-5.3	0.000***

SD: Standard deviation, * $P < 0.05$, ** $P < 0.01$, and *** $P < 0.001$

Table 4 reveals that 71.2% of CRC patients experienced a moderate loss of appetite, while 81.3% of the control group did not. Regarding unintentional weight loss, 83.3% of CRC cases and 15.7% of control subjects were affected. As for neurological and psychological injuries, 95.5% and 98.5% of the control group were free of mental disease, respectively. Regarding self-perception of nutritional status, most cases (59.1%) are uncertain about their nutritional condition, whereas the majority of controls (72.4%) believe they have no problems with feeding. The majority of CRC cases perceive their health to be inferior to that of persons of the same age (40.9%), whereas the majority of control subjects perceive their health to be superior to that of people of the same age (63%)

Table 4. Frequency distribution for studied subjects according to nutritional and health problems

	Case		Control		Chi ² test	
	no	%	no	%	Value	Sig
Loss of appetite						
Severe loss of appetite	6	9.1%	2	1.5%	70.8	0.000***
Moderate loss of appetite	47	71.2%	23	17.2%		
There is no loss of appetite	13	19.7%	109	81.3%		
Total	66	100%	134	100%		
Involuntary weight loss						
No	11	16.7%	113	84.3%	85.9	0.000***
Yes	55	83.3%	21	15.7%		
Total	66	100%	134	100%		
Neurological and psychological injuries						
Severe dementia or depression	0	0%	1	0.7%	3.7	0.155
Moderate senile dementia	3	4.5%	1	0.7%		
Not suffering from mental illness	63	95.5%	132	98.5%		
Total	66	100%	134	100%		
Self-view of nutritional status						
I have malnutrition	9	13.6%	8	6.0%	39.9	0.000***
Not sure about nutritional status	39	59.1%	29	21.6%		
I has no problem with feeding	18	27.3%	97	72.4%		
Total	66	100%	134	100%		
Patient view of his health compared to people of the same age						

	Case		Control		Chi ² test	
	no	%	no	%	Value	Sig
Not the same quality	27	40.9%	13	9.7%	43.2	0.000***
do not know	24	36.4%	29	21.6%		
Same quality	15	22.7%	85	63.4%		
Better	0	0.0%	7	5.2%		
Total	66	100%	134	100%		

*** $P < 0.001$

According to Table 5, 47.0% of CRC cases lost 1 to 5 kg of body weight, while 22.7% lost 6 to 10 kg. Most control subjects (83.6%) did not lose weight, whereas 10.4% lost 1 to 5 kg. In terms of the influence of appetite loss on food intake, the findings revealed that the majority of CRC cases eat less due to loss of appetite (78.8%). In contrast, the majority of control individuals had healthy appetites and ate enough food (88.8%).

In regards to MST score (the higher the score, the greater the danger of malnutrition), 82.1% of control subjects scored 0 marks, indicating that they are not at risk of malnutrition compared to 12.1% of CRC cases; however, the MST scores of 43.9% and 18.2% of CRC cases were 4 and 5, respectively. Furthermore, 6.1% and 9.1% of CRC cases had MST scores of 6 and 7, respectively. According to the malnutrition screening tool (MST), 84.9% of CRC patients (83.30% males and 86.70% females) were classified at risk, compared to 14.9% of control subjects (17.0% males and 17.7% females).

Table 5 : Frequency distribution of studied subjects according to Malnutrition screening tool (MST) variables and score.

	Case		Control		Chi-s	
	no	%	no	%	value	sig
Kilograms lost						
0 kg	10	15.2%	112	83.6%	87.9	0.000***
From 1 to 5 kg	31	47.0%	14	10.4%		
From 6 to 10 kg	15	22.7%	6	4.5%		
From 11 to 15 kg	4	6.1%	1	0.7%		
16 kg and more	6	9.1%	1	0.7%		
total	66	100%	134	100%		
Eating less due to loss of appetite						
No	14	21.2%	119	88.8%	90.6	0.000***
Yes	52	78.8%	15	11.2%		
Total	66	100%	134	100%		
MST score (total degree)						

	Case		Control		Chi-s	
	no	%	no	%	value	sig
0	8	12.1%	110	82.1%	102.0	0.000***
1	2	3.0%	4	3.0%		
2	0	0.0%	2	1.5%		
3	5	7.6%	4	3.0%		
4	29	43.9%	10	7.5%		
5	12	18.2%	3	2.2%		
6	4	6.1%	1	0.7%		
7	6	9.1%	0	0.0%		
Total	66	100%	134	100%		
Calcification MST score						
0 or 1=not at risk	10	15.1%	114	85.1%	103	0.000***
2 or more = at risk	56	84.9%	20	14.9%		

*** $P < 0.001$

Table 6 reveals that most of the studied subjects (65.2% and 64.9%, respectively) consume at least one serving of dairy products (milk and cheese) daily. Furthermore, the majority of study respondents (93.9% and 89.6%, respectively) consumed at least two servings of cereals or eggs per week. In terms of meat consumption (meat, fish, and poultry daily), the majority of controls (59%) consumed at least one serving daily, while the majority of CRC patients (69.7%) did not consume meat daily. Half of the CRC cases (50%) and the vast majority of controls (80.6%) consumed two or more servings of fruits and vegetables each day. The findings revealed that most study participants (59.1% and 88.8%, respectively) consumed 3 to 5 cups of fluid (water, tea, milk, coffee, juice) per day. However, a sizable proportion of CRC patients (40.9%) consume fewer than 3 cups of coffee daily.

Table 6 : Dietary consumption from different food groups among studied subjects

	Case		Control		Chi ²	
	no	%	no	%	value	sig
Dairy product intake/daily (milk and cheese)						
Yes	43	65.2%	87	64.9%	0.9	0.001***
No	23	34.8%	47	35.1%		
Total	66	100%	134	100%		
Cereals/weekly (two or more servings of cereal)						
Yes	62	93.9%	120	89.6%	1.0	0.308
No	4	6.1%	14	10.4%		

	Case		Control		Chi ²	
	no	%	no	%	value	sig
Total	66	100%	134	100%		
Meats intake/one serving daily (meat, fish, and poultry daily)						
Yes	20	30.3%	79	59%	14.5	0.000***
No	46	69.7%	55	41%		
Total	66	100%	134	100%		
Consume fruits and vegetables/daily						
Yes	33	50%	26	19.4%	19.9	0.000***
No	33	50 %	108	80.6%		
Total	66	100%	134	100%		
Consume fluid/daily						
Less than 3 cups	27	40.9%	15	11.2%	23.5	0.000***
3 to 5 cups	39	59.1%	119	88.8%		
Total	66	100%	134	100%		

*** $P < 0.001$

4. Discussion

The findings of this study found that the majority of CRC patients lived in Egypt's rural areas. CRC appeared to be a "rare" disease in rural Africa not long ago; nevertheless, published pieces of evidence in West Africa over the last 30 years have demonstrated decade-by-decade rises in the prevalence of CRC in rural areas [19, 20]. Minorities and uninsured people are more likely to be diagnosed with CRC [21]. Furthermore, most CRC patients in this study had secondary education and did not work. These sociodemographic characteristics have been linked to cancer survival [22], and they may predispose people to poor diets, which may be a risk factor for CRC.

Obesity, unhealthy diets, and physical inactivity have all been related to an increased risk of numerous cancers, including endometrial, colon, breast, renal cell, pancreatic, and esophageal [23-26].

According to the findings, most CRC patients experienced a moderate lack of appetite, resulting in an involuntary weight loss of more than 3 kg over the last three months. These findings were consistent with the fact that cancer patients typically experience loss of appetite and weight loss [27]. Researchers believe this loss of appetite is caused by chronic gastrointestinal discomforts, such as cramps, gas, or pain, the sensation that the intestine does not empty fully, weakness, or exhaustion. Unintentional weight loss is a big issue that harms bodily function, survival outcomes, and quality of life [28, 29]. Unintentional weight loss of more than 5% occurs in a substantial number of patients with CRC (67%),

pancreatic cancer (54%), and lung cancer (35%), indicating that starvation is common in these cancer types [30-32].

According to the current findings, CRC patients suffer stress, neurological, and psychological damage. These findings were consistent with previous research that revealed that many cancer patients suffer from impaired physiological and biological function, malnutrition, weight gain/loss, fatigue, and psychological disturbance [14]. Stress lowers the quality of life of cancer patients and may influence their prognosis independently [33]. However, the findings suggest that this may be attributable to the intensity of the disease's symptoms.

The results revealed that the male mean age was 53, and the mean female age was 56. Historically, the Asian region had the highest proportional prevalence of CRC among young people. According to studies, the prevalence of young cancer is 38% in Egypt [6, 34], 18% in Turkey [35], 39% in India [36], and 23% in Saudi Arabia [37]. According to the surveillance, epidemiology, and end outcomes program database in the United States, around 5% of all CRCs are diagnosed in patients over 45 [38]. Rectal cancer is found in up to 18% of men and women over 50 [39,40].

The results revealed that most CRC patients do not participate in sports, their jobs do not need physical activity, and they do not engage in physical activities in their spare time. According to a recent report, modifications in modifiable lifestyle and environmental risk variables known to be connected with cancer incidence can prevent 30-40% of malignancies [41]. Physical activity, in particular, has been shown to lessen the incidence of colon and others cancers [41]. For most of these cancer sites, the extent of the risk reduction linked with increased physical activity varies between 10 and 25% [42]. Fitness and public health professionals and health care practitioners worldwide are encouraged to promote the message to the general public and cancer survivors to be as physically active as their age, ability, and cancer status allow [43].

Although meat is a significant source of high-quality protein for a substantial part of the world's population, red meat is a high-protein source that contains all essential amino acids, iron, selenium, zinc [44], vitamin D, and B12 [42]. Meat consumption protects against malnutrition and enhances kids' cognitive development [42]. According to the current study, most CRC patients do not regularly consume adequate protein from meat, fish, and poultry.

However, according to the World Cancer Research Fund (WCRF) [43,44], consuming processed meats is a convincing cause of colon cancer (CRC)[45]. Sodium nitrite has emerged as a possible culprit in the CRC-inducing effects of processed meats [46].

Fish is also an excellent source of fatty acids, essential components of cell membranes. It also has high quantities of vitamin D and selenium, which may help prevent the development of certain malignancies ^[47]. Most significantly, fish is high in omega-3 fatty acids, which have anticarcinogenic and anti-inflammatory properties and may protect against gastrointestinal malignancies ^[48, 49].

Most patients in this study lose 1 to 5 kg by eating less due to loss of appetite. In terms of MST score classification, the results showed that most patients (85%) scored two or more marks, putting them at risk of malnutrition (due to poor eating habits and recent weight loss ^[50,51]). According to these findings, malnutrition and muscle wasting are common in cancer patients, compromising clinical outcomes and leading to longer hospital stays ^[7,11].

Disease-related malnutrition (DRM) is quite common among cancer patients, with 40-80% experiencing it during their illness. Other types of cancer, as well as the stage, location, and treatment style, all impact DRM ^[30, 52].

Screening may help the cost of CRC treatment because most screening strategies have become cost-effective compared to the rising costs of chemotherapy for advanced CRC ^[53].

Recent studies ^[54, 55] indicate that oncology patients are at risk of malnutrition due to the disease process and treatment implications. Malnutrition is regulated by tumor type, location, stage, and therapy strategy in this patient population.

Malnutrition has been linked to poorer treatment response ^[56], higher post-surgical complications ^[57], and decreased quality of life ^[58].

5. Conclusion

Most people with colorectal cancer lived in poor socioeconomic conditions, which may have contributed to their cancer survival. Most patients with colorectal cancer experienced a considerable appetite reduction, resulting in an involuntary weight loss of more than 3 kg over the past three months. Malnutrition and muscular loss were prevalent among 85% of patients with CRC. Although protein protects against malnutrition, most CRC patients do not consume enough protein from meat, fish, and poultry daily.

6. Reference :

- [1] Feddern ML, Jensen TS, Laurberg S. Chronic pain in the pelvic area or lower extremities after rectal cancer treatment and its impact on quality of life: a population-based cross-sectional study. *Pain*. 2015 Sep;156(9):1765-1771.
- [2] Mattox TW. Cancer Cachexia: Cause, Diagnosis, and Treatment. *Nutr Clin Pract*. 2017 Oct;32(5):599-606.

- [3] Estrada-Martínez LE, Moreno-Celis U, Cervantes-Jiménez R, Ferriz-Martínez RA, Blanco-Labra A, García-Gasca T. Plant Lectins as Medical Tools against Digestive System Cancers. *Int J Mol Sci.* 2017 Jul 3;18(7):1403. doi: 10.3390/ijms18071403.
- [4] Rawla P, Sunkara T, Barsouk A. Epidemiology of colorectal cancer: incidence, mortality, survival, and risk factors. *Prz Gastroenterol.* 2019;14(2):89-103.
- [5] Makhlof NA, Abdel-Gawad M, Mahros AM, Lashen SA, Zaghloul M, Eliwa A, et al. Colorectal cancer in Arab world: A systematic review. *World Journal of Gastrointestinal Oncology.* 2021 Nov 11;13(11):1791.
- [6] Abou-Zeid AA, Khafagy W, Marzouk DM, Alaa A, Mostafa I, Ela MA. Colorectal cancer in Egypt. *Diseases of the colon & rectum.* 2002 Sep;45(9):1255-60.
- [7] Muscaritoli M, Arends J, Bachmann P, Baracos V, Barthelemy N, Bertz H et al. ESPEN practical guideline: Clinical Nutrition in cancer. *Clinical Nutrition.* 2021;40(5):2898-2913.
- [8] Brown JC, Caan BJ, Meyerhardt JA, Weltzien E, Xiao J, Cespedes et al. The deterioration of muscle mass and radiodensity is prognostic of poor survival in stage I-III colorectal cancer: a population-based cohort study (C-SCANS). *J Cachexia Sarcopenia Muscle.* 2018 Aug;9(4):664-672.
- [9] De Caluwé L, Van Nieuwenhove Y, Ceelen WP. Preoperative chemoradiation versus radiation alone for stage II and III resectable rectal cancer. *Cochrane Database Syst Rev.* 2013 Feb 28;(2):CD006041.
- [10] Fung TT, Brown LS. Dietary Patterns and the Risk of Colorectal Cancer. *Curr Nutr Rep.* 2013 Mar 1;2(1):48-55.
- [11] Gupta D, Vashi PG, Lammersfeld CA, Braun DP. Role of nutritional status in predicting the length of stay in cancer: a systematic review of the epidemiological literature. *Ann Nutr Metab.* 2011;59(2-4):96-106.
- [12] Mahfouz EM, Sadek RR, Abdel-Latif WM, Mosallem FA, Hassan EE. The role of dietary and lifestyle factors in the development of colorectal cancer: case control study in Minia, Egypt. *Cent Eur J Public Health.* 2014 Dec 1;22(4):215-2.
- [13] Benoist S, Brouquet A. Nutritional assessment and screening for malnutrition. *J Visc Surg.* 2015 Aug;152 Suppl 1:S3-7.
- [14] Reber E, Schönenberger KA, Vasiloglou MF, Stanga Z. Nutritional Risk Screening in Cancer Patients: The First Step Toward Better Clinical Outcome. *Front Nutr.* 2021 Apr 7;8:603936.
- [15] Chen X, Ang E, Bte Nasir N. Nutritional screening among patients with cancer in an acute care hospital: a best practice implementation project. *Int J Evid Based Healthc.* 2012 Dec;10(4):377-81.
- [16] Shaw C, Fleuret C, Pickard JM, Mohammed K, Black G, Wedlake L. Comparison of a novel, simple nutrition screening tool for adult oncology inpatients and the

- Malnutrition Screening Tool (MST) against the Patient-Generated Subjective Global Assessment (PG-SGA). *Support Care Cancer*. 2015 Jan;23(1):47-54.
- [17] Charan J, Biswas T. How to calculate sample size for different study designs in medical research? *Indian J Psychol Med*. 2013 Apr;35(2):121-6.
- [18] Ferguson M, Capra S, Bauer J, Banks M. Development of a valid and reliable malnutrition screening tool for adult acute hospital patients. *Nutrition*. 1999 Jun;15(6):458-64.
- [19] Irabor DO. Emergence of Colorectal Cancer in West Africa: Accepting the Inevitable. *Niger Med J*. 2017 May-Jun;58(3):87-91.
- [20] Dakubo JC, Naaeder SB, Tettey Y, Gyasi RK. Colorectal carcinoma: An update of current trends in Accra. *West Afr J Med*. 2010;29:178–83.
- [21] You YN, Xing Y, Feig BW, Chang GJ, Cormier JN. Young-onset colorectal cancer: is it time to pay attention?. *Archives of internal medicine*. 2012 Feb 13;172(3):287-9.
- [22] Taheri M, Tavakol M, Akbari ME, Almasi-Hashiani A, Abbasi M. Relationship of Socio Economic Status, Income, and Education with the Survival Rate of Breast Cancer: A Meta-Analysis. *Iran J Public Health*. 2019 Aug;48(8):1428-1438.
- [23] Jemal A, Bray F, Forman D, O'Brien M, Ferlay J, Center M, et al. Cancer burden in Africa and opportunities for prevention. *Cancer*. 2012;118:4372–84
- [24] Al-Qahtani MF, Alghareeb AI, Alramadan ZS, Ismail MS. Relationship between lifestyle factors and overweight and obesity among Saudis females' adolescents in Eastern Province. *Journal of the Saudi Society for Food and Nutrition (JSSFN)*. 2021;14(1):32-40.
- [25] Ismail MS, Qahiz NM. Can Dietary Calcium Consumption be Beneficial in Body Weight Loss Regimen? *Merit Res. J. Med. Med. Sci*. 2016;4:282-9.
- [26] Zaghoul S, Awad H, Khallaf N. Review of Effect of Regulatory Strategies on Obesity. *Journal of Applied Nutritional Sciences* 2022; 1(3): 63-91
- [27] Dev R, Wong A, Hui D, Bruera E. The Evolving Approach to Management of Cancer Cachexia. *Oncology (Williston Park)*. 2017 Jan 15;31(1):23-32.
- [28] Fearon K, Strasser F, Anker SD, Bosaeus I, Bruera E, Fainsinger RL, et al.. Definition and classification of cancer cachexia: an international consensus. *Lancet Oncol*. (2011) 12:489–95.
- [29] Tisdale MJ. Cachexia in cancer patients. *Nat Rev Cancer*. (2002) 2:862–71. 10.1038/nrc927
- [30] Bozzetti F, Mariani L, Lo Vullo S; SCRINIO Working Group. The nutritional risk in oncology: a study of 1,453 cancer outpatients. *Support Care Cancer*. 2012 Aug;20(8):1919-28.

- [31] Dewys WD, Begg C, Lavin PT, Band PR, Bennett JM, Bertino JR, et al.. Prognostic effect of weight loss prior to chemotherapy in cancer patients. Eastern cooperative oncology group. *Am J Med.* (1980) 69:491–7.
- [32] Laviano A, Meguid MM. Nutritional issues in cancer management. *Nutrition.* 1996, 12:358–71.
- [33] Butler LD, Koopman C, Cordova MJ, Garlan RW, DiMiceli S, Spiegel D. Psychological distress and pain significantly increase before death in metastatic breast cancer patients. *Psychosom Med* 2003; 65: 416–426
- [34] Deen KI, Silva H, Deen R, Chandrasinghe PC. Colorectal cancer in the young, many questions, few answers. *World J Gastrointest Oncol.* 2016 Jun 15;8(6):481-8.
- [35] Alici S, Aykan NF, Sakar B, Bulutlar G, Kaytan E, Topuz E. Colorectal cancer in young patients: characteristics and outcome. *Tohoku J Exp Med.* 2003;199:85–93
- [36] Gupta S, Bhattacharya D, Acharya AN, Majumdar S, Ranjan P, Das S. Colorectal carcinoma in young adults: a retrospective study on Indian patients: 2000-2008. *Colorectal Dis.* 2010;12:e182–e189
- [37] Isbister WH. Colorectal cancer Below Age 40 in The Kingdom of Saudi Arabia. *Aust N Z J Surg.* 1992;62:468–472.
- [38] National Cancer Institute. Cancer Stat Facts -Colorectal Cancer. (Accessed 25 August 2022). From <https://seer.cancer.gov/statfacts/html/colorect.html>
- [39] Ahnen DJ, Wade SW, Jones WF, Sifri R, Silveiras JM, Greenamyre J, et al. The increasing incidence of young-onset colorectal cancer: a call to action. In *Mayo Clinic Proceedings* 2014 Feb 1 (Vol. 89, No. 2, pp. 216-224). Elsevier.
- [40] Mauri G, Sartore-Bianchi A, Russo AG, Marsoni S, Bardelli A, Siena S. Early-onset colorectal cancer in young individuals. *Mol Oncol.* 2019 Feb;13(2):109-131.
- [41] Friedenreich CM, Ryder-Burbidge C, McNeil J. Physical activity, obesity and sedentary behavior in cancer etiology: epidemiologic evidence and biologic mechanisms. *Mol Oncol.* 2021 Mar;15(3):790-800.
- [42] McTiernan A, Friedenreich CM, Katzmarzyk PT, Powell KE, Macko R, Buchner D, et al. Physical Activity in Cancer Prevention and Survival: A Systematic Review. *Med Sci Sports Exerc.* 2019 Jun;51(6):1252-1261.
- [43] Patel AV, Friedenreich CM, Moore SC, Hayes SC, Silver JK, Campbell KL, et al. American College of Sports Medicine Roundtable Report on Physical Activity, Sedentary Behavior, and Cancer Prevention and Control. *Med Sci Sports Exerc.* 2019 Nov;51(11):2391-2402.
- [44] World Cancer Research Fund . Food, Nutrition, Physical Activity, and the Prevention of Cancer: A Global Perspective. Choice: Current Reviews for Academic Libraries; Middletown, CT, USA: 2007.

- [45] Salter AM. The effects of meat consumption on global health. *Rev Sci Tech*. 2018 Apr;37(1):47-55. doi: 10.20506/rst.37.1.2739. PMID: 30209430.
- [46] Crowe W, Elliott CT, Green BD. A Review of the In Vivo Evidence Investigating the Role of Nitrite Exposure from Processed Meat Consumption in the Development of Colorectal Cancer. *Nutrients*. 2019 Nov 5;11(11):2673.
- [47] World Cancer Research Fund/American Institute for Cancer Research. *Food, Nutrition, Physical Activity and the Prevention of Cancer. A Global Perspective*. Washington, DC: American Institute for Cancer Research; 2007.
- [48] Chan JM, Gann PH, Giovannucci EL. Role of diet in prostate cancer development and progression. *J Clin Oncol*. 2005;23:8152–8160
- [49] Muscaritoli M, Lucia S, Farcomeni A, Lorusso V, Saracino V, Barone C, et al. Prevalence of malnutrition in patients at first medical oncology visit: the PreMiO study. *Oncotarget*. (2017) 8:79884–96.
- [50] Mohamed MS, Al Mosilhi AH, Al Abbad FA. Study of common food habits among students of health colleges in Dammam and its relation to lifestyle, social, economical, and health factors. *Egyptian Journal of Nutrition and Health*. 2007;2(1):161-73.
- [51] Abuzaid OI, Alkhalaf SA, Alessa HA, Al-Ghamdi SA, Bawazier SS, Badr-Eldin MS. Relationship between Food Habits and Body Weight of Saudi Adolescent Females, Cross-Sectional Study. *Journal of Applied Nutritional Sciences*. 2022;1(1):26-37.
- [52] Yu XF, Zou J, Dong J. Fish consumption and risk of gastrointestinal cancers: a meta-analysis of cohort studies. *World J Gastroenterol*. 2014 Nov 7;20(41):15398-412.
- [53] Lansdorp-Vogelaar I, van Ballegooijen M, Zauber AG, Habbema JD, Kuipers EJ. Effect of rising chemotherapy costs on the cost savings of colorectal cancer screening. *J Natl Cancer Inst*. 2009;101(30):1412–1422.
- [54] Segura A, Pardo J, Jara C, Zugazabeitia L, Carulla J, de Las Peñas R, García-Cabrera E, Azuara ML, Casadó J, Gómez-Candela C. An epidemiological evaluation of the prevalence of malnutrition in Spanish patients with locally advanced or metastatic cancer. *Clinical Nutrition*. 2005 Oct 1;24(5):801-14.
- [55] Sanchez-Lara K, Ugalde-Morales E, Motola-Kuba D, Green D. Gastrointestinal symptoms and weight loss in cancer patients receiving chemotherapy. *Br J Nutr*. 2013 Mar 14;109(5):894-7.
- [56] Andreyev HJ, Norman AR, Oates J, Cunningham D. Why do patients with weight loss have a worse outcome when undergoing chemotherapy for gastrointestinal malignancies?. *European journal of cancer*. 1998 Mar 1;34(4):503-9.

- [57] Ross PJ, Ashley S, Norton A, Priest K, Waters JS, Eisen T, et al. Do patients with weight loss have a worse outcome when undergoing chemotherapy for lung cancers? *Br J Cancer*. 2004 May 17;90(10):1905-11.
- [58] Ravasco P, Monteiro-Grillo I, Vidal PM, Camilo ME. Dietary counseling improves patient outcomes: a prospective, randomized, controlled trial in colorectal cancer patients undergoing radiotherapy. *J Clin Oncol*. 2005 Mar 1;23(7):1431-8.

مدى احتمالية الإصابة بسوء التغذية بين مرضى سرطان القولون والمستقيم البالغين، دراسة عينة مختبرة وعينة ضابطة

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يشيع سوء التغذية بين مرضى السرطان، ويمكن باستخدام فحص المخاطر الغذائية تحديد الأشخاص المعرضين لخطر سوء التغذية مبكراً. هدفت الدراسة إلى استكشاف مقدار انتشار سوء التغذية بين مرضى سرطان القولون والمستقيم. كانت هذه الدراسة دراسة بأثر رجعي لعينة مختبرة وعينة ضابطة وشملت 66 مريضاً بسرطان القولون والمستقيم و 134 شخص غير مصاب. تم اختيار المرضى عشوائياً من العيادة الخارجية، مستشفى جامعة المنوفية. جمع الباحثون بيانات عن الحالة الاجتماعية والاقتصادية والتاريخ الصحي والمؤشرات الأنثروبومترية والحالة التغذوية. تم تطبيق أداة فحص سوء التغذية لتصنيف المشاركين وفقاً لحالتهم التغذوية. كشفت النتائج أن أكثر من نصف المبحوثين جميعاً كانوا من الذكور وكان معظم المرضى (57.6%) يحملون شهادة ثانوية، ومعظم غير المرضى (37.3%) يحملون شهادة جامعية. وكان معظم المرضى (74.2%) من الريف، في حين أن معظم غير المرضى (61.2%) كانوا من الحضر. مؤشر كتلة الجسم للمرضى كان أقل من غير المرضى ($P < 0.001$). كان فقدان الشهية سائداً بين 71.2% من المرضى وفقد 83.3% من المرضى الوزن بطريقة لاإرادية. وفقاً لفحص سوء التغذية كان 84.9% من المرضى يعانون من سوء التغذية. معظم المبحوثين من المرضى وغير المرضى كانوا يستهلكون منتجات الألبان (الحليب والجبن) يومياً واستهلك ما يقرب من 90% من جميع المشاركين حصتين على الأقل من الحبوب أو البيض أسبوعياً. تناول معظم الأفراد غير المرضى (59%) حصة واحدة على الأقل من اللحوم (اللحوم والأسماك والدواجن) يومياً، في حين أن غالبية المرضى (69.7%) لم يفعلوا ذلك. استهلك الأشخاص غير المرضى فواكه وخضروات أكثر من المرضى. الخلاصة، كان أكثر من أربعة أخماس مرضى سرطان القولون والمستقيم معرضين لمخاطر سوء التغذية، ولم يستهلك معظمهم كميات كافية من الأغذية الأساسية.

الكلمات المفتاحية: المستقيم، القولون، أداة فحص سوء التغذية، سوء التغذية، النظام الغذائي