

## **Effect of Nursing Interventions on Health Practices and Perceptions regarding Colorectal Cancer among Community-Dwelling Older Adults in Alexandria, Egypt**

**Heba Ahmed Mohsen<sup>1</sup>,Sarah Ali Hafez Hewi<sup>2</sup> ,Eman Taha Sayed<sup>3</sup> ,Nagwa Abd El Fattah Ibrahim<sup>4</sup>**

*Assistant lecturer of Gerontological Nursing Department, Faculty of Nursing, Alexandria University, Egypt<sup>1</sup> , Lecturer of Gerontological Nursing Department, Faculty of Nursing, Alexandria University, Egypt<sup>2</sup> , Professor of Nursing Education Department, Faculty of Nursing, Alexandria University, Egypt<sup>3</sup> , Professor Gerontological Nursing Department, Faculty of Nursing, Alexandria University, Egypt<sup>4</sup>*

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### **ABSTRACT**

**Background:** Colorectal cancer (CRC) is one of the most common cancers worldwide and it is one of the most commonly diagnosed types of cancer at an older age. The gerontological nurse is one of the professionals who act as an educator, health promoter, direct care provider in screening and motivator for older adults to adopt a healthy lifestyle behavior for early detection and prevention of CRC.  
**Aim:** The present study aimed to determine the effect of nursing interventions on knowledge and perceptions regarding colorectal cancer among community-dwelling older adults.  
**Research design:** Quasi experimental design was used in this study.  
**Setting:** The study was conducted in El-Waffa club of elderly persons at Alexandria, Egypt.  
**Sampling:** Sixty older adults aged 60 years and above were recruited in the study, who have no cognitive impairment, have no or mild depression, able to read and write and not currently diagnosed with colorectal cancer.  
**Method:** Six tools were used as follows: Mini-Mental State Examination Scale, Geriatric Depression Scale Short Form, Older Adults Socio-Demographic and Clinical Data Structured Interview Schedule, Colorectal Cancer Knowledge Questionnaire, Colorectal Cancer Perceptions scale, and older adults' health practices regarding prevention of colorectal cancer.  
**Results:** Current study revealed that mean post-test practices and perceptions scores are significantly higher than pre-test scores regarding colorectal cancer among the study subjects.  
**Conclusion:** Nursing interventions were significantly improved the studied seniors' practices, perceptions regarding CRC.  
**Recommendations:** Raising awareness of the public about CRC, its management, its prevention, and CRC screening measures in all various health settings.

**Key words:** Colorectal cancer, Nursing interventions, Older Adults, Perceptions, Practices

## INTRODUCTION

Elderly patients are predictable to account for seventy percent of all cancer patients. The incidence of CRC is also growing and considers the fourth commonest cancer worldwide.(Islam et al., 2018). In Egypt, CRC is the 6<sup>th</sup>most common cancer in males and females(Elshafei et al., 2017).The median age at diagnosis is fifty three years with male predominance (American cancer Society 2016). Aging remains one of the single greatest idiopathic risk factor for the progression of CRC. This may be due to the fact that aging associated with normal physiological changes of colon such as increase the risk for developing polyps or little lumps may grow inside the colon or rectum. Also, genetic changes which are probably a cumulative effect over the years.Furthermore, elders 'intestinal immune system is impaired in aging which increase susceptibility of elders to gut infections and intestinal inflammation .As well, older people have weak immune system that allowing the abnormal cellular growth of cancer. (American Society of Clinical Oncology,ASCO, 2017).Early-stage cancers are usually asymptomatic; cancers that have grown large enough to cause symptoms have a much worse prognosis. CRC is preventable and fulfills the criteria for a disease for which screening is appropriate. Unfortunately, screening rates are not adequate to prevent this potentially devastating cancer.(Arbor 2016)

Colorectal cancer screening and prevention is an essential component of colorectal cancer control plan which is a key to decrease mortality from the disease in old age. If found early, before the cancer is able to spread, the 5-year survival rate of colorectal cancer is about 90%. (Ernst et al., 2016). The early discovery of CRC and inhibition suggest lifestyle modifications, such as raise the practice of exercise, decreasing the body weight, decreasing usage of alcohol, adjusting dietary habits, and reducing tobacco use to decrease the tumorigenic environment inside the epithelial cells of colon (Katz et al., 2012). Preventing of colorectal cancer also focuses on increasing knowledge regarding CRC, and changing as well as understanding the perceptions known to affect the behavior of screening (National Cancer Institute, NCS, 2014).

Not only physical health is a determinant for colorectal cancer screening but also, several factors could influence older adults' screening choices. These factors such as level of education, Availability and accessibility of health care providers, lack of financial support, inadequate of knowledge about CRC cancer screening procedures, cultural health perceptions, trust of healthcare providers, inadequate of transportation, inadequate time, and

perception of elders that they are not require for this tests, and cancer itself is incurable, embarrassment and painful sensation resulted from procedure, and fear from being diagnosed by colorectal cancer (Gimeno2012)Therefore, colorectal cancer screening especially in Egyptian elders is very important to be explored because of these determinants in order to improve colorectal cancer outcome and survival.

The gerontological nurses have a significant role in prevention of colorectal cancer as they have professional practice skills as well as all-inclusive perception that help them to provide special interventions for elders at whole level of health care. Colorectal cancer prevention is the activities and processes associated with protecting elders from colorectal cancer occurrence and consequently, affect the burden of disease and disability (Owusu et al., 2011 & Wagner et al., 1991). The detection of colorectal cancer at the primary stage is considered a significant method to be used as safeguard practices as well as has been positively that associated with decline the morbidity and mortality of the disease. The Center for Disease Control (CDC) stated that early detection using preventive colorectal cancer measures such as colorectal cancer awareness, screening, life style changes, and chemoprevention, are the finest protection contrary to mortality and morbidity from this disease (Bener et al., 2010).

## **Significance of the study**

The world's population is ageing: virtually every country in the world is experiencing growth in the number and proportion of older persons in their population. With increase in life expectancy among older adults; the prevalence of chronic diseases and disabilities is also expected to increase. Despite the effectiveness of colorectal cancer screening behaviors and preventive practice in reducing mortality, research findings indicated that screening rates remain low. To our knowledge, there is no research done on the national level regarding colorectal cancer prevention and screening practices among community dwelling elders.

## **AIM OF THE STUDY**

The aim of this study was to determine the effect of nursing interventions on health practices and perceptions regarding colorectal cancer among community dwelling older adults.

**Research hypotheses:**

H1: Older adults who receive the proposed nursing interventions achieve higher scores in health practices regarding colorectal cancer post the intervention than before it.

H2: Older adults who receive the proposed nursing interventions achieve higher scores in perceptions regarding colorectal cancer post the intervention than before it.

**SUBJECTS AND METHOD**

The subjects and methods of the present study were portrayed under the following four designs:-

- Technical design.
- Operational design.
- Administrative design.
- Statistical design.

**1-Technical design:** The technical design includes research design, setting, subjects and tools of data collection which used in this study.

**a. Research design:** The study followed a quasi-experimental research design (one group pre-test and post-test).

**b. Setting:** The study was conducted in El-Waffa club of elderly persons at Alexandria. This club is affiliated to the Ministry of Social Solidarity, Egypt. The total number of the older adults who are registered at the club is 600. The club has an attendance rate of 10 to 12 elders every day. This setting was selected because the attendance rate in the club is high, enough to be included in the study and the registered older adults are from different places in Alexandria, and it is suitable to implement the study interventions.

**c. Subjects:** A convenience sample of 60 older adults from the previously mentioned setting was included in the study. The Epi info program V 7 was used to estimate the required sample size using the following parameters; population size 46, expected frequency 50%, acceptable error 10% and confidence coefficient 95%.

**d. Inclusion criteria:** The study included older adults who aged 60 years and above, have no cognitive impairment (score 24 and more on the Mini Mental State Examination), have no or mild depression (score 0 to 4 or 5 to 8 on the geriatric depression scale short form (GDSSF), able to read and write and not currently diagnosed with colorectal cancer.

**e. Tools of the study:** Six tools were used to collect the necessary data from the study subjects as follows:

**Tool (I): Mini Mental State Examination (MMSE) Scale:** The Arabic version of the MMSE was translated by **El OKL (2002)** was used. It is a reliable measure for assessing cognitive function of the elderly, (reliability coefficient of 0.93 and 0.91 for normal and demented elderly respectively). It consists of 30 questions that investigate the memory, orientation to item and place, attention, calculation, naming, repetition, registration language, praxis and coping of a design. The maximum score is 30. Scoring is based on the number of correct items, each correct answer is coded as 1 point and each incorrect answer is coded as 0 point. Elders scoring from 24 to 30 are considered to have no cognitive impairment.

**Scoring system: Possible scores are categorized in the following manner:**

- 24-30: indicates normal cognitive function.
- 18-23: indicates mild cognitive impairment of the older adult.
- 0-17: indicates severe cognitive impairment of the older adult.

**Tool (II): Geriatric Depression Scale Short-Form (GDS-SF):** The Geriatric Depression Scale – short Form (GDS-SF) is a 15-item self-report instrument developed by **Yesavage et al (1983)** to assess depression and general well-being in the elderly. The older adult chooses the best answer either yes (1) or no (0) for how he/she have felt over the past week. The GDS-SF was translated into Arabic and approved to be valid and reliable by **Elhusseini (2013)**. The Arabic version of this scale was used in the present study.

**Scoring system:** Scores range from 0 to 15. Items are summed for a total score. A score from 0 to 4 indicates no depression, 5 to 8 mild depression, 9 to 11 moderate depression, and 12-15 severe depression.

**Tool (III): Older Adults Socio-Demographic and Clinical Data Structured Interview**

**Schedule:** This tool was developed by the researcher based on relevant literature (**Berkowitz et al., 2008 & Clipp et al., 2004**) to collect the following information from the study subjects and include two parts:-

**Part I:** Socio-demographic data of the older adults such as, age, marital status, educational level, occupation prior to retirement, income, source of income, social support such as presence of spouse, or other significant personnel.

**Part II.** Clinical data of the older adults include medical health history: the presence of any medical problems, family history of colorectal cancer or other tumors (benign or malignant), previous history of benign colon tumor, or rectal cancer, or inflammatory bowel disease, elders previous exposure to radiation, and availability as well as accessibility of medical services within the older adult area of residence.

**Tool (IV): Colorectal Cancer Knowledge Questionnaire (CRCKQ):** This tool was developed by **Weinrich et al (1992)**. The CRCKQ consists of 12 questions that are scored by true or false with a possible range of scores 0-12. Each correct response counting as one point and each incorrect response counting as 0 point. These questions assessed knowledge regarding incidence of colorectal cancer, prognosis, and methods of detection. Therefore, higher scores on the Colorectal Cancer Knowledge Questionnaire reflected greater knowledge of colorectal cancer. The reliability of the CRCKQ has been tested and validated in older populations with Cronbach's coefficient alpha ranging 0.79 to 0.85 by **Powe (1994)** at The University of South Carolina. All scores were transformed into score % as follow:

**Scoring system: Score % = (the observed score / the maximum score) x 100.**

The responses were categorized in the following manner:

**Poor:** score % < 33.3%

**Fair:** score % 33.3%-66.6%

**Good:** score % >66.6%

**Tool (V): Colorectal Cancer Perceptions scale (CRCPS):** This tool was adapted by **Jacobs (2002)** from a scale developed by **Champion et al (1984)**. Champion developed scales to measure perceptions of susceptibility, seriousness, benefits, barriers, health motivation, and confidence related to breast cancer screening. Jacobs (2002) adapted the Champion scales to be used in collecting data related to colorectal cancer screening by substituting colorectal cancer instead of breast cancer in the wording of questions. It is a well-established instrument with 36 items representing 6 subscales related to perceptions about susceptibility to CRC (5 items), seriousness of CRC (7 items), benefits of colon screening (6 items), barriers to colon screening (6 items), healthy practices (7 items), and confidence in colon screening (5 items). The scale uses a 3-point Likert format with the coding disagree (1), neutral (2), and agree (3). Higher scores in all subscales indicates more confidence, health motivation in performing CRC screening, and more susceptibility and seriousness of CRC, as well as more benefits and barriers to CRC. Questionnaire results were compiled to determine the effects of nursing interventions on health perceptions regarding CRC. The reliability of the CRCPS has been tested and validated in older populations with Crombach's coefficient alpha which ranged from 0.60 to 0.78 by **Griffin (2011)** at the University of North Carolina at Greensboro. Each subscale has unique score as following:

- Confidence to perform colon screening: **(5-15)**
- Health motivation for colorectal cancer screening: **(7-21)**
- Susceptibility of colorectal cancer: **(5-15)**
- Seriousness of colorectal cancer: **(7-21)**
- Benefits of colon screening: **(6-18)**
- Barriers to colon screening: **(6-18)**
- Total perceptions score: **(36-108)**

**Scoring system:** A score of less than 10 indicates low level of confidence to perform colon screening and a score from 10 to 15 indicates high level of confidence to perform colon screening. A score of less than 14 indicates low level of health motivation and a score from

14 to 21 indicates high level of health motivation. A score of less than 10 indicates low perception of susceptibility regarding colon cancer and a score from 10 to 15 indicates high perception of susceptibility regarding colon cancer. A score of less than 14 indicates low perception of seriousness regarding colon cancer and a score from 14 to 21 indicates high perception of seriousness regarding colon cancer. A score of less than 12 indicates low perception of benefits regarding colon screening and a score from 12 to 18 indicates high perception of benefits regarding colon screening. A score of less than 12 indicates low perception of barriers regarding colon screening and a score from 12 to 18 indicates high perceived barriers of colon screening. A score from 36 to less than 73 indicates low perception and a score from 73 to 108 indicated high perception.

#### **Tool (VI): Older adults' health practices regarding prevention of colorectal cancer**

This tool was developed by the researcher based on relevant literature as (**Christou et al., 2012 &Bostick et al., 2003**) to assess older adults' health practices regarding colorectal cancer and CRC screening. It is composed of 32 items distributed along three domains physical self-care (17 items), Psychosocial (5items), and colorectal cancer screening (10 items). This part will include questions about health practices regarding colorectal cancer that affect the liability of the older adults for having CRC. For example, obesity, physical inactivity, smoking, diet high in red or processed meats, and excessive exposure for stress. Each subscale has unique score. The responses for the first and second domain are 3-point likert scale 1=never, 2=sometimes and 3=nearly all the time. On the other hand, part 3 screening had unique response ranged from 1 to 3 for each question.

**Scoring system:** The total score generated by summing up the scores of each domain as following.

- Physical domain (**17-51**).
- Psychosocial domain (**5-15**).
- Colorectal cancer screening domain (**10-30**).
- Total score for tool (**32-96**).

For physical domain, a score of from **17-27** indicates poor physical practice, a score of from **28-39** indicates satisfactory physical practice, and a score of from **40-51** indicate good physical practice. For psychosocial domain, a score of from **5-7** indicates poor psychosocial practice, a score of from **8-11** indicates satisfactory psychosocial practice, and a score of from **12-15** indicates good psychosocial practice. For colorectal cancer screening domain, a score of from **10-15** indicates poor screening practice, a score of from **16-22** indicates satisfactory screening practice, and a score of from **23-30** indicates good screening practice. For total score, a score of from **32-52** indicates poor health practice regarding CRC, a score of from **53-74** indicates satisfactory health practice regarding CRC, and a score of from **75-96** indicates good health practice regarding CRC.

**2-Operational design:** The operational design includes preparatory phase, tool validity and reliability, pilot study , and field work.

**a. Preparatory phase:**

It was included reviewing of related literature and theoretical knowledge of various aspects of the study using books, articles, and internet's periodicals and magazines to develop tools for data collection.

**b. Tools validity and reliability:**

1. Tool III (Socio-Demographic and Clinical Data Structured Interview Schedule) was developed by the researcher based on relevant literature to collect the socio-demographic and clinical data of the study subjects.
2. Tool IV (The Colorectal Cancer Knowledge Questionnaire (CRCKQ)) and Tool V (Colorectal Cancer Perceptions scale (CRCPS)) were translated into Arabic language by the researcher and was tested for content validity by five experts in the related fields including experts in gerontological nursing , medical-Surgical nursing and nursing education.
3. Tool VI (Older adults' health practices regarding colorectal cancer) was developed by the researcher based on recent relevant literature. This tool included practices and skills required for protection of elders from colorectal cancer. It covered items such as reduction of body weight, performing physical activity, cessation of smoking,

consumption diet rich in vegetables as well as fruits, dealing with stress, different screening procedures and importance of enough sleep hours.

4. **Reliability** of tool IV, V, and VI were tested using Cronbach's alpha test. The tool was applied on 6 older adults from the El-Waffa club of elderly persons which not included in study sample. The reliability result for tool IV was 0.76, the reliability of tool V was 0.78, and the reliability of tool VI was 0.83.

**b. Pilot study:** A pilot study was carried out on 10% of total study subjects (6 older adults) to test the clarity, applicability, feasibility and relevance of the tools used and to determine the needed time for the application of the study tools. The patients who were included in the pilot study excluded from the sample because modifications were done after conducting pilot study.

**c. Ethical considerations:**

- 1- Approval of the study protocol was obtained from Ethical Committee in the Faculty of Nursing at Alexandria University before starting the study.
- 2- An informed written consent was obtained from each study subject included in this study after explanation of the study purpose .Study subjects' privacy and anonymity were maintained along with confidentiality of the collected data.
- 3- The researcher informed the study subjects that they have the right to withdraw from the study at any time.

**d. Field work:**

The implementation of the study interventions and the data collection started from the beginning of January until the beginning of May 2019.

***Program phases:***

It included extensive reviewing of relevant literature and theoretical knowledge of related to the different aspects of the study using books, articles, internet, periodicals and magazines.

**Phase one: “Preparation Phase”:**

- a- The researcher prepared **the proposed study nursing interventions** based on the guidelines of American Cancer Society and National Cancer Institute review as well as from

reviewing the different literature. This proposed study nursing interventions was conducted as follows:

1. Session one: **Basic information about CRC.**
  2. Session two: **CRC screening procedures.**
  3. Session three: **Healthy diet to decrease risk for CRC:**
  4. Session four: **Constipation and how to prevent it.**
  5. Session five: **Exercise and activity**
  6. Session six: **Dealing with psychological problems and stress.**
  7. Session seven: **The importance of sleep and rest.**
  8. Session eight: **Medications and smoking.**
- b. The researcher developed an action plan and included what, how much, when and how many days a week the older adult is going to practice the required health care practices based on the needs and the abilities of each study subject.

### **Phase II “Implementation phase”:**

1. Each older adult who fulfills the inclusion criteria wasinterviewed individually by the researcher while sitting comfortably , the researcher explained the purpose of the study to each older adult who fulfilled the inclusion criteria and the necessary data was collected
2. The researcher used to assess of the study subjects' socio-demographic and clinical data, knowledge, perceptions and health practices by using tool number 4, 5, and 6 respectively. It was done before the administration of the study interventions. Data time collection ranged between 45 to 60 minutes for every session, with provision of rest periods.
3. The researcher took the phone numbers of the study subjects to ensure continuous contact. As well as, the researcher gave each elder her phone number and a written note with the

time and date of the next session.

4. Before each session, the researcher used to measure the blood pressure and the blood glucose level using glucocheck in order to motivate the older adults to attend and to check their health status for each session. These data were recorded on a special record
5. For each study subject the proposed nursing interventions was conducted in 8 sessions, over 4 weeks period (2 sessions per week), with one day apart. The session included from two to four (2-4) study subjects in every session.
6. The researcher provided from 3 to 5 sessions every day. Before starting a new session, the older adults were asked questions by the researcher related to the topic discussed in the previous session and ensure their understanding. Then a summary of the previous session was started to help older adults to refresh their information
7. During each session, a flip chart containing illustrative pictures was used by the researcher in order to clarify the desired knowledge and practices for the older adults elder; other teaching methods were used such as power point presentations, videos, and open discussion.
8. The researcher used to demonstrate the skills as the exercise or measures to decrease stress and supported it by providing videos and pictures then asked each older adult to re-demonstrate that they have acquired and learned during sessions to ensure their understanding and grasping of the needed practices. . Each session is ended with objectives and action plan to achieve it, and a handout including the content of the session was given by the researcher to each study subjects to guide and enrich their memory about the activities which took place in the session. These handouts follow the principles of health education of older adults. Moreover, the researcher summarized the main points in the session and allowed time for the older adults to ask questions and get answers.
9. During all sessions, the researcher used to review the action plan calendar to assess the older adult's commitment with the plan and identify obstacles that may hinder the achievement of the preset goal and try to overcome them.

### **Phase III “Evaluation and Follow up Phase**

After the implementation of the study interventions, the researcher reassessed the knowledge, perceptions, and health practices by using tool 4, 5, and 6. This assessment was carried out two times, immediately after the implementation of the study interventions and then after 4 weeks later.

### **3- Administrative design:**

1. An official letter was issued from the Faculty of Nursing, Alexandria University and forwarded to the administrator of the El-waffa club to obtain her permission to collect the necessary data from El-waffa club.
2. The purpose of the study, time and date of data collection were explained by the researcher to the administrator of the El-waffa club and the head of the organization and a written permission was obtained in order to carry out the study interventions.

### **4-Statistical design:**

Data were fed to the computer and analyzed using IBM SPSS software package version 20.0. (Armonk, NY: IBM Corp) Qualitative data were described using number and percent. Quantitative data were described using range (minimum and maximum), mean and standard deviation. Significance of the obtained results was judged at the 5% level. All statistical analysis was done using two tailed tests and alpha error of 0.05. P value less than or equal to 0.05 was considered to be statistically significant. **The used tests were :**

- 1 - Chi-square test :**For categorical variables, to compare between different groups
- 2 - Fisher's Exact or Monte Carlo correction:**Correction for chi-square when more than 20% of the cells have expected count less than 5
- 3 - McNemar and Marginal Homogeneity Test:** Used to analyze the significance between the different stages
- 4 - Pearson coefficient:** To correlate between two normally distributed quantitative variables
- 5 - Friedman test :** For abnormally distributed quantitative variables, to compare between more than two periods or stages for knowledge, perception and practice (Pre, immediate, after 4 weeks).
- 6-Correlation analysis:**Correlation is used to test the nature and strength of relation between two quantitative / ordinal variables. The spearman correlation co efficient (rho) is expressed as the Pearson co efficient. The sign of the co efficient indicates the nature of relation (positive / negative) while the value indicates the strength of relation as follow: Weak

correlation for rho less than 0.25, intermediate correlation for rho of value between 0.25-0.74 and strong correlation for values between 0.75-0.99.

## **RESULTS:-**

**Table (1)** : illustrates that the age of the study subjects ranges from 60 to 83 years, with a mean of  $68.10 \pm 4.36$  years. In relation to sex, 76.7 % of the older adults included in this study are females. Married subjects constituted 56.7% of the study subjects; university education and secondary are found in 60 % and 33.3% of older adults in the study group respectively. Regarding the medical history of the study subjects, 96.7% of them reported having medical diseases. As for the family history of tumor, 66.7% of the study subjects reported having no family history of tumor.

**Table (2):** shows that before the implementation of the study interventions 61.7 % of the studied older adult's knowledge about CRC is poor. Immediately after the y interventions, 96.7 % of the study subjects have good knowledge. Four weeks after the interventions, 88.3% of the study subjects reported having good level of knowledge , with a highly statistically significant difference between the older adults' knowledge level before, immediately after and 4 weeks later ( $P=0.000$ ).

**Table (3):** demonstrates that 35% of the study subjects reported low perceived confidence, 65% of them reported high perceived confidence to perform CRC screening before the implementation of the study interventions. Immediately after the implementation of the interventions and four weeks later 98.3 % of the study subjects reported high perceived confidence to perform CRC screening with a highly statistically significant difference between phases of the study ( $P=0.000$ ). Regarding the studied older adults' perceptions about health motivation, before the implementation of the interventions 81.7% of the subjects reported low perceived health motivation, immediately after the implementation of the interventions 81.7% of studied subjects reported high perceived health motivation, and four weeks later 86.7% of them reported high perceived health motivation with a statistically ( $P=0.000$ ).

**Table (4) :** depicts that before the implementation of the study interventions 53.3% of studied subjects reported satisfactory level of physical health practices regarding CRC . Immediately after the implementation of the interventions and four weeks later, 90% of reported good level with a highly statistically significant difference later as ( $P=0.000$ ). Regarding psychosocial

health practices, before the interventions 43.3% reported satisfactory level , immediately after the implementation of the interventions and 4 weeks later the study subjects reported to have good level as presented by 83.3 % and 86.7% respectively with a highly statistically significant difference between them as ( $P=0.000$ ).Before the implementation of the interventions 91.7% reported poor screening practices and immediately after the interventions 63.3% reported good level of screening practices with a highly statistically significant difference between them as ( $p=0.000$ ).

**Table (5):**shows the correlation matrix between the studied older adults' health practice levels, their knowledge and perception levels across the program. Immediately after the implementation of study interventions a statistically significant correlations was noticed between studied older adults' perception and their health practices ( $r=0.262 P=0.044$ ). On the other hand, at four weeks after the implementation of study interventions, significant correlations were found between studied older adults' health practices and both their knowledge as well as perception. ( $r= 0.256 P=0.048$  and  $r=0.330 P=0.010$  respectively). Also, the knowledge level immediately after the implementation of study interventions was significantly correlated with its level in the follow up phase ( $r=0.865 p=0.000$ ). Concerning perception, a significant correlations were found between perception level in the pre-program phase and both perception level immediately and perception level in the follow up phases (  $r=0.495 p=0.000$  and  $r=0.474 p=0.000$ ) respectively.

**Table (1):** Distribution of the studied older adults according to socio-demographic and clinical data

Socio-demographic data	Total (N=60)	
	No.	%
<b>Age (years)</b>		
▪ 60-	12	20.0
▪ 65-	24	40.0
▪ 70-	20	33.3
▪ ≥75	4	6.7
Min. – Max.	60.0 – 83.0	
Mean ± SD.	68.10 ± 4.36	
<b>Sex</b>		
▪ Female	46	76.7
▪ Male	14	23.3
<b>Marital status</b>		
▪ Married	34	56.7
▪ Widowed	23	38.3
▪ Divorced	1	1.7
▪ Single	2	3.3
<b>level of education</b>		
▪ Read and write	1	1.7
▪ Basic education	3	5.0
▪ Secondary education	20	33.3
▪ University and more	36	60.0
<b>Income</b>		
▪ Sufficient	42	70.0
▪ Insufficient	18	30.0
<b>Medical history of medical diseases</b>		
▪ No	2	3.3
▪ Yes #	58	96.7
▪ Hypertension	42	72.4
▪ Diabetes mellitus	23	39.7
▪ Coronary artery diseases	11	19.0
▪ Renal diseases	7	12.1
▪ Musculoskeletal diseases	7	12.1
▪ Colon disease	4	6.9
▪ Gastric disease	4	6.9
▪ Endocrine disease	4	6.9
▪ Other diseases	4	6.9

<b>Family history of tumors</b>			
▪ No		40	66.7
▪ Yes		20	33.3

# Multiple responses were given

**Table (2):** The knowledge level of the study older adults regarding colorectal cancer before and after the implementation of the study interventions

Knowledge	Phases of the study interventions						Test of Significance	
	Before the interventions		Immediately after interventions		4 weeks after interventions			
	(n = 60)	%	(n = 60)	%	(n = 60)	%		
- Poor	37	61.7	0	0.0	1	1.7	X <sup>2</sup> = 123.34	
- Fair	16	26.7	2	3.3	6	10.0	P= 0.000*	
- Good	7	11.7	58	96.7	53	88.3		
<b>Mean ±SD</b>	<b>3.95±3.089</b>		<b>10.63±1.134</b>		<b>10.13±1.501</b>		<b>F= 190.50</b> <b>P= 0.000*</b>	

$\chi^2$  = Chi square test

t = Paired t test

F= ANOVA test \* Statistically significant

at P ≤0.05

**Table (3):** The studied older adults' perceptions of colorectal cancer before and after the implementation of the study interventions

Item	Phases of the study interventions						Test of Significance
	Before the interventions		Immediately after interventions		4 weeks after interventions		
	(n=60)	%	(n=60)	%	(n=60)	%	
<b>Perception of Confidence</b>							
- Low	21	35.0	1	1.7	1	1.7	$\chi^2 = 39.878$
- High	39	65.0	59	98.3	59	98.3	$P = 0.000^*$
<b>Perception of Health motivation</b>							
- Low	49	81.7	11	18.3	8	13.3	$\chi^2 = 74.070$
- High	11	18.3	49	81.7	52	86.7	$P = 0.000^*$
<b>Perception of Susceptibility</b>							
- Low	12	20.0	6	10.0	4	6.8	$\chi^2 = 3.462$
- High	48	80.0	54	90.0	56	93.2	$P = 0.177$
<b>Perception of Seriousness</b>							
- Low	19	31.7	13	21.7	13	21.7	$\chi^2 = 2.1333$
- High	41	68.3	47	78.3	47	78.3	$P = 0.344$
<b>Perception of Benefits</b>							
- Low	33	55.0	2	3.3	2	3.3	$\chi^2 = 65.386$
- High	27	45.0	58	96.7	58	96.7	$P = 0.000^*$
<b>Perception of Barriers</b>							
- Low	15	25.0	51	85.0	51	85.0	$\chi^2 = 63.297$
- High	45	75.0	9	15.0	9	15.0	$P = 0.000^*$
<b>Total perception of colorectal cancer</b>							
- Low	24	40.0	6	10.0	4	6.7	$\chi^2 = 26.398$
- High	36	60.0	54	90.0	56	93.3	$P = 0.000^*$
<b>Mean <math>\pm</math> SD</b>	<b>80.38<math>\pm</math>10.00</b>		<b>89.20<math>\pm</math>6.686</b>		<b>89.75<math>\pm</math>6.809</b>		<b>F = 26.047</b>
							<b>P = 0.000^*</b>

$\chi^2$  = Chi square test t = Paired t test F= ANOVA test\* Statistically significant at P  $\leq 0.05$

**Table (4):** Health practices level of the studied older adults regarding colorectal cancer before and after the implementation of the study interventions.

Item	Phases of the study interventions						Test of Significance	
	Total (N= 60)							
	Before the interventions		Immediately after interventions		4 weeks after interventions			
	No.	%	No.	%	No.	%		
<b>Physical Health</b>								
- Poor	1	1.7	0	0.0	0	0.0	X <sup>2</sup> = 48.346	
- Satisfactory	32	53.3	6	10.0	4	10.0	P= 0.000*	
- Good	27	45.0	54	90.0	56	90.0		
<b>Psychosocial health</b>								
- Poor	0	0.0	0	0.0	0	0.0	X <sup>2</sup> =17.567	
- Satisfactory	26	43.3	10	16.7	8	13.3	P= 0.000*	
- Good	34	56.7	50	83.3	52	86.7		
<b>Screening practices</b>								
- Poor	55	91.7	1	1.7	11	18.3	X <sup>2</sup> = 133.196	
- Satisfactory	3	5.0	21	35.0	33	55.0	P= 0.000*	
- Good	2	3.3	38	63.3	16	26.7		
<b>Total health practices</b>								
- Poor	1	1.7	0	0.0	0	0.0	X <sup>2</sup> = 100.95	
- Satisfactory	52	86.7	6	10.0	8	13.3	P= 0.000*	
- Good	7	11.7	54	90.0	52	86.7		
<b>Mean ± SD</b>	<b>54.25±6.806</b>		<b>69.83±5.515</b>		<b>68.90±5.498</b>		<b>F= 128.52</b>	
							<b>P= 0.000*</b>	

$\chi^2$  = Chi square test    t = Paired t test                  F= ANOVA test    \* Statistically significant at P ≤0.05

**Table (5):** The Correlation Matrix between the studied older adults' health practices levels and their knowledge and perception levels across the study interventions

		Knowledge (Pre)	Perception (Pre)	Health practice (Pre)	Knowledge (Post1)	Perception (Post1)
Knowledge (Pre)	r					
	P					
Perception (Pre)	r	<b>0.528</b>				
	P	<b>0.000*</b>				
Health practice (Pre)	r	<b>0.465</b>	<b>0.320</b>			
	P	<b>0.000*</b>	<b>0.013*</b>			
Knowledge (Post1)	r	<b>0.275</b>	<b>0.562</b>	<b>0.250</b>		
	P	<b>0.033*</b>	<b>0.000*</b>	<b>0.054</b>		
Perception (Post1)	r	<b>0.365</b>	<b>0.495</b>	<b>0.180</b>	<b>0.046</b>	
	P	<b>0.004*</b>	<b>0.000*</b>	<b>0.168</b>	<b>0.729</b>	
Health practice (Post1)	r	<b>0.174</b>	<b>0.179</b>	<b>0.758</b>	<b>0.218</b>	<b>0.262</b>
	P	<b>0.185</b>	<b>0.171</b>	<b>0.000*</b>	<b>0.095</b>	<b>0.044*</b>
Knowledge (Post2)	r	<b>0.133</b>	<b>0.550</b>	<b>0.173</b>	<b>0.865</b>	<b>0.004</b>
	P	<b>0.311</b>	<b>0.000*</b>	<b>0.185</b>	<b>0.000*</b>	<b>0.975</b>
Perception (Post2)	r	<b>0.409</b>	<b>0.474</b>	<b>0.207</b>	<b>0.047</b>	<b>0.969</b>
	P	<b>0.001*</b>	<b>0.000*</b>	<b>0.113</b>	<b>0.720</b>	<b>0.000*</b>
Health practice (Post2)	r	<b>0.086</b>	<b>0.246</b>	<b>0.638</b>	<b>0.211</b>	<b>0.306</b>
	P	<b>0.516</b>	<b>0.058</b>	<b>0.000*</b>	<b>0.105</b>	<b>0.018*</b>

R= Pearson Correlation \* significant at  $\leq 0.05$ 

## DISCUSSION:

Definitely, older adults' knowledge about the colorectal cancer symptoms, healthy practices and screening behaviors is a significant factor associated with older adults' participation in preventive colorectal cancer behaviors as well as detection of less advanced colorectal cancer stage. The present study findings revealed that one third of the study older adults have poor to fair knowledge about CRC, only minority of the study older adults have good knowledge about CRC before the implementation of the study subjects.

This finding may be explained by three reasons. Firstly, knowing scientific knowledge of CRC requires interest from older adults to search for much information from scientific references, social networking and mass media. Secondly, people do not seek help unless the health problem is occurred. Thirdly, the concept and the intention to find out about a health problem which does not exist is not a common practice in our culture and even not a welcomed idea. These reasons for not having good knowledge about CRC are supported by the study finding about level of education of the study older adults who are mostly have university of education and more. This study finding is in agreement with Pow et al (2006) & Naylor et al (2012) who reported that most of the study older subjects have poor knowledge before the interventions. However, the same finding is in contrast to the finding of a study done in England by Power and Wardle, (2015) who reported that the majority of participants had moderate level of knowledge and he justified this finding by the fact that the sample included in the study encompassed older adults with previous history of CRC which added to their knowledge regarding this issue.

The present study findings revealed that majority of the studied older adults demonstrated having good knowledge about CRC immediately and four weeks after the implementation of the study interventions compared to minority of the studied older adults who reported moderate knowledge about it. The present study showed a highly statistically significant difference between the older adults' knowledge level before, immediately after and four weeks after the implementation of the study interventions as ( $p=0.000$ ). This result may be explained by the fact that university education reported by more than half of the studied older adults that help them to grasp all the necessary knowledge. The environment in the club was very calm and there was suitable and prepared room to give the sessions for elders. This finding in the line with findings of several studies which reported that there is a significant relation between studied older adults' overall knowledge before and after the study interventions Kindree et al., (2007) and Robb et al., (2009).

Confidence is the first construct of the health belief model (HBM) scale. The findings of the present study revealed that approximately more than one third of the study older adults reported to have low perception confidence in CRC screening whereas about more than half reported to have high perception confidence in CRC screening before the study interventions. Immediately after and four weeks after the

implementation of interventions, most of the study subjects reported high perception of confidence. The difference between a perception of confidence in CRC screening of the study older adults before and after (immediately and four weeks later) the implementation of the study interventions is a highly statistically significant ( $p=.0000$ ). This positive change may be explained by the study older adults ' level of awareness regarding CRC and methods of early detection increase after receiving the study interventions. In addition, study older adults ' revealed positive perceptions with the intention to utilize CRC screening and follow health practices. The positive change also revealed that the study older adults felt maintaining good health even when not sick was very important. These results are in line with price et al., (2003) who found that greatly improvements in the perception of confidence among the respondents after the program which is considered an important factor in seeking screening tests and health practices.

Health motivation includes strategies available to the older adults to promote readiness for CRC health practices and screening tests. Before the study interventions, the majority of the study older adults reported low perception health motivation of CRC screening compared to minority of the study older adults with high perception of health motivation of CRC screening. Whereas, immediately and four weeks, after implementation of the study interventions the majority of the study older adults have high perception of health motivation and minority have low perception of health motivation. The difference between a perception of health motivation of the study older adults before and after (immediately and four weeks later) the implementation of the study interventions is a highly statistically significant ( $P=.0000$ ). This positive change can be justified by consistency of session for about three months with continuous motivation to comply with health promotion activities. Moreover, researcher used to discuss with the manager and the responsible members of the health committee of the club for the updating of the health topics which are introduced weekly at the club on Wednesdays. This result is in agreement with Ross et al., (2004) &Seeff et al., (2003) who indicated that participants perceive the importance of maintaining good health, compliance with health practices and discover CRC early through different screening methods.

Regarding the perception of the study older subjects of susceptibility for CRC before the implementation of the study interventions, the present study findings revealed

that approximately one quarter of the studied older subjects had a low perceived of susceptibility for CRC. Susceptibility for CRC indicated a great change in the study older adults' responses, however significant difference is not found. The findings from this present study indicated that attention needs to be paid to the efficacy of building public awareness about CRC. It is important to find mechanisms to reinforce screening through education without creating undue concern or fear. What older adults are willing to do to avoid an increased likelihood of developing CRC is not clear. Heightened perceptions of risk may motivate some elders to participate in health promotion or disease prevention behaviors. This finding is in accordance with Ross et al., (2004) who revealed that nurse played an important role to promote and influence positive CRC perceptions which is likely to lead to increased screening rates of elders in the community. This finding is in opposition with Weller et al., (2005) reported that there was no change in perceived susceptibility in the participants after the study.

About one third of the study older subjects have a low perception of seriousness for CRC before the study interventions. Immediately after and four weeks after the implementation of the study interventions more than three quarters of older subjects reported to have high perception of seriousness and slightly one quarter of the study older adults reported low perception of seriousness. Seriousness for CRC indicated a great change in the study older adults' responses, however significant difference is not found. This finding revealed that study older adults believed that the consequences of getting CRC are significant and serious. Interestingly, study older adults reported high perceptions in the seriousness scale after hearing that CRC is a dangerous diseases but it is very preventable and treatable.

These results indicated that the study interventions are effective in increasing study older subjects perception that they could get CRC. Furthermore, the interventions improve the perception that screening and health practices decrease the risk of CRC. These findings are consistent with Wardle et al., (2003) who concluded that an increased perception of seriousness has been positively associated with CRC screening compliance after the psychoeducational intervention. Menon et al., (2003) found similar results in their study regarding variables related to fecal occult blood test and colonoscopy.

The results of a present study revealed that more than one half of the study older adults have low perception of benefits of CRC screening practices before the

implementation of the study interventions. Whereas, about most of them reported to have high perception benefits of CRC screening practices and minority have low perception of benefits immediately after the implementation of study interventions and after four weeks later. The difference between a perception of benefits of CRC screening of the study older adults before and after (immediately and four weeks later) the implementation of the study interventions is a highly statistically significant ( $P=.0000$ ).

These results can be justified by that the educational sessions were effective in increasing the belief that CRC is a preventable disease and the belief that screening decreases risk of CRC. Moreover, increasing the awareness of older adults that CRC has no early symptoms may promote perception of CRC screening benefits. Furthermore, study older adults believed that the recommended action of utilizing a screening test would protect them from getting CRC after the study intervention. This result is also consistent with **Bostick et al., (2003)** who identified the following three benefits of CRC screening: finding cancer early, freedom from worry about CRC, and reassurance that one was cancer-free. Moreover, this result was consistent with Beeker et al., (2000) who found that they documented improvement in perception benefits of CRC screening tests.

Study older adults identified their personal barriers to utilize CRC screening tests for example CRC are not effective in preventing CRC, fear of finding cancer, concerns about the efficacy of specific screening tests and they are too embarrassed to talk to their health care provider or embarrassed to perform screening practices. Perception of barriers indicated a great change in the participants' responses after the implementation of the study interventions, one quarter of the study older adults have low perception of barriers of CRC screening and three quarters have high perception of barriers before the implementation of the study interventions. After the interventions immediately and after four weeks, the majority of them have low perception of barriers of CRC screening and very minority of them have high perception of barriers with a highly significant difference ( $P=.0000$ ). This result may be related to the study interventions helped to explore ways to eliminate or reduce these barriers. For example, most participants were pessimistic about the outcome of a diagnosis of cancer and they did not believe that it would be beneficial to find cancer early because of better treatment prospects.

This result is in agreement with the result of a study done by Rustgi (2004) who found the majority of sample had low perceived barriers after implementing the

program for breaking the barriers to colorectal cancer screening. Additionally, Lipkus et al., (2006) supported this conclusion and added that the obstacle to early diagnoses and healthier outcomes were the deficiency of screening and prevention resources in African American communities. However, this finding is in opposition with a study done by Briss et al., (2004) who found that high perception of barriers between participants even after the intervention and justified that difficulty with starting a new behavior or a new habit, fear of not being able to perform a desired behavior and embarrassment is considered an individual's own estimation of the obstacles in his or her way for adopting a new behavior.

This present study finding revealed that nearly more than half of the study older adults have high perception regarding CRC before the implementation of the study interventions compared to most of the study older adults have high perception regarding CRC after the implementation of the study interventions. Very minority of the study older subjects reported having low perception regarding CRC after the implementation of the study interventions with a highly statistically significant difference between the older adults' perceptions levels before, immediately after and four weeks after the implementation of the study interventions as ( $p=0.000$ ). These results can be explained by this study revealed that the majority of the study older adults reported having good knowledge regarding the colorectal cancer immediately after the implementation of the study interventions. The knowledge is the vital factor to change the perceptions. This result is in the line with Hart et al., (2007) who revealed that increased perception of participants regarding CRC after the implementation of health education program to improve adherence to CRC screening practices.

According to the findings of the current study, the proposed hypotheses were confirmed and proven. Prevention and early detection of CRC can not only reduce mortality and morbidity significantly but also promote elders' overall quality of life and decrease the cost related to colorectal cancer death.

## **CONCLUSION:**

Based on the findings of the present study, it can be concluded that knowledge about colorectal cancer, perceptions and practices regarding colorectal cancer have been improved in the majority of the studied older adults after the implementation of the

study interventions than before it, and the difference is highly statistically significant. Both study hypotheses are supported by the study data.

## **RECOMMENDATIONS :**

**Based on the results of the present study the following recommendations are suggested:**

1. Design health-related educational leaflets and posters using simple, familiar words about CRC prevention and its screening procedures that should be available at elderlyclubs, different health care setting and also to be disseminated via mass media and social media.
2. For further researches , replication of the present study results on a larger sample from different geographical areas to achieve more generalized results

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## تأثير التدخلات التمريضية على الممارسات الصحية والأدراكات المتعلقة بالسرطان القولوني المستقيمي بين كبار السن المقيمين فالمجتمع

هبة احمد محسن حسن، د/ سارة على حافظ، ا.د/ ايمان طه السيد ،ا.د/ نجوى عبد الفتاح ابراهيم  
مدرس مساعد تمريض المسنين- كلية التمريض - جامعة الاسكندرية ، مدرس تمريض المسنين-كلية التمريض -  
جامعة الاسكندرية ، استاذ تعليم التمريض-كلية التمريض-جامعة الاسكندرية ، استاذ تمريض المسنين-كلية  
التمريض - جامعة الاسكندرية .

### الخلاصة

السرطان القولوني المستقيمي هو الورم الخبيث الأكثر شيوعاً الذي يتم تشخيصه لدى كبار السن في جميع أنحاء العالم. العديد من كبار السن ليسوا على وعي بخطرهم المتزايد لسرطان القولوني المستقيمي ، ولديهم معرفة قليلة عن الأعراض المبكرة لسرطان القولوني المستقيمي ، المستقيمي والفحص ، لذلك يتم تشخيص السرطان القولوني المستقيمي لدى كبار السن في مراحل أكثر تقدماً في المرض. اهداف الدراسة: تهدف هذه الدراسة إلى تحديد تأثير التدخلات التمريضية على الممارسات الصحية والأدراكات المتعلقة بسرطان القولوني المستقيمي بين كبار السن المقيمين في المجتمع. نوع الدراسة : ما قبل التجاري. مكان اجراء الدراسة: اجريت هذه الدراسة في نادي الوفاء لكبار السن الخاضع لوزارة التضامن الاجتماعي بالاسكندرية – مصر. عينة الدراسة: تتكون عينة البحث من 60 فرد من كبار السن من الذين حضروا إلى المكان المذكور أعلاه ويبلغ عمرهم 60 سنة فأكثر ، من كبار السن القادرين على التواصل بشكل فعال. أدوات البحث: ستة أدوات بحثية قد تم استخدامها من قبل الباحث وهي : مقياس الحالة الذهنية البسيط لكتاب السن ، مقياس الأكتئاب المصغر لكتاب السن، استمار استبيان الخصائص الديموغرافية والسريرية لكتاب السن، استمار استبيان المعلومات عن السرطان القولوني المستقيمي، مقياس الأدراكات عن سرطان القولوني المستقيمي، الممارسات الصحية لكتاب السن فيما يتعلق بالوقاية من السرطان القولوني المستقيمي اهم النتائج : وجود فرق ذو دلالة إحصائية كبيرة بين مستوى الممارسات الصحية والأدراكات المتعلقة بسرطان القولوني المستقيمي لكتاب السن قبل وبماشراً بعد ، وبعد 4 أسابيع من تطبيق تدخلات الدراسة . الملخص : المعلومات تجاه السرطان القولوني المستقيمي والأدراكات والممارسات الصحية المتعلقة بسرطان القولوني المستقيمي قد تحسنت في غالبية كبار السن الذين تمت دراستهم بعد تنفيذ تدخلات الدراسة أكثر من قبل تنفيذ تدخلات الدراسة ، والفرق مهم للغاية من الناحية الإحصائية. لذا نوصي بزيادة وعي المجتمع عن مرض السرطان القولوني المستقيمي ، طرق الوقاية منه ، طرق الاكتشاف المبكر عن طريق استخدام الوسائل التعليمية المختلفة التي يجب توافرها في نوادى المسنين، دور المسنين ،وجميع العيادات الخارجية و المنشآت الصحية المختلفة .

**الكلمات المرشدة:** السرطان القولوني المستقيمي، كبار السن، التدخلات التمريضية،الأدراكات، الممارسات.