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EVALUATION OF COLORECTAL CANCER SCREENING AWARENESS AND COMPLIANCE RATES OVER THE AGE OF 40: SINGLE CENTER DATA IN TÜRKİYE

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Abstract: The frequency of colorectal cancer is increasing under the age of 50, and new sights have emerged regarding the initiation of screening in the earlier age group. This study aims to measure the consciousness of patients over the age of 40 about colorectal cancer screening and to reveal the screening rates of individuals over the age of 50. 300 consecutive patients who applied to our center and were older than 40 years of age were included. The questionnaire was created based on current guidelines and literature knowledge by the investigators and done through face-to-face interviews. Patients over 50 years of age who did not undergo screening were analyzed by dividing them into groups according to their socio-demographic characteristics and colorectal cancer risk factors. While 64.7% of the participants stated that they knew about colorectal cancer screening, only 32.4% of the participants aged 50 and over had colorectal cancer screening. The vast majority of patients stated that they did not have enough knowledge about the subject. The rate of participants who stated that they were considering entering the cancer screening program after completing this questionnaire was 73.7%. Colorectal cancer screening rates of non-smokers, women, and married participants were higher than the other group (P=0.016, P=0.017, and P=0.033, respectively). This study shows low screening compliance of individuals over the age of 50. We think that it is important to encourage and inform all adults over the age of 40 about colorectal cancer screening for public health.

Keywords: Cancer screening, Colon cancer, Colorectal cancer, Rectum cancer, Risk factors

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1. Introduction

Colorectal cancer is the 4th most common cancer among adults worldwide. However, it ranks 3rd in mortality after lung and breast cancer (WHO, 2022). Considering the course of the last 20 years, it is observed that although the incidence has decreased, its place among the causes of mortality has not changed. Again, in the last 20 years, a significant increase has been revealed in the number of people diagnosed with colorectal cancer aged 50 and younger (Stoffel and Murphy, 2020). In a study conducted with a large cohort of patients younger than 50 years of age who were diagnosed with colorectal cancer without any risk factors, it was shown that 86% of this patient group were symptomatic at the time of admission and were mostly diagnosed at an advanced stage (Dozois et al., 2008). The most common risk factors for colorectal cancer are a family history of colorectal cancer in first-degree relatives, hereditary polyposis syndromes, and a personal history of adenomatous polyp, a history of inflammatory bowel disease, obesity, and smoking. However, even if there are no risk factors, it is recommended that all individuals over the age of 50 should be included in the screening program for colorectal cancer (Lansdorp-Vogelaar and Von Karsa, 2012). The goal of cancer screening programs is to reduce disease-specific mortality through early diagnosis. Colon, breast, and prostate cancer screenings have shown that specific mortality for these cancers decreases (Cronin et al., 2018).

Colorectal cancer screening methods are stool occult blood examination once a year, sigmoidoscopy, or total colonoscopy every 10 years starting from the age of 50 (Lansdorp-Vogelaar and Von Karsa, 2012). Since sigmoidoscopy and total colonoscopy are interventional tests, different methods such as computed tomography colonography, stool DNA test, and capsule endoscopy are also being developed for colorectal cancer screening, but their routine use in colorectal cancer screening is not recommended yet (Lansdorp-Vogelaar and Von Karsa, 2012). In Türkiye, all men and women between the ages of 50-70 are screened for colorectal cancer by performing a stool occult blood test every two years and a colonoscopy every 10 years. Colorectal cancer screening is terminated in 70-year-old individuals who have negative occult blood tests in the last two stools (URL1).

Since the frequency of colorectal cancer diagnosis is increasing under the age of 50 and it is diagnosed at a more advanced stage in this age group, new opinions have emerged regarding the initiation of screening in the earlier age group. Accordingly, colorectal cancer screening is recommended for all adults aged 50-75 with evidence level A, and adults aged 45-50 with evidence level B. It is recommended to screen according to the clinician's evaluation in the group over 75 years old (Davidson et al., 2021).

This study aims to measure the level of knowledge about colorectal cancer screening of patients over the age of 40 who applied to the Internal Medicine outpatient clinic of Samsun Training and Research Hospital and to reveal the screening rates of individuals over the age of 50.

2. Materials and Methods

300 consecutive patients over the age of 40 who applied to Samsun Training and Research Hospital Internal Medicine outpatient clinic were included in the study. The participants were asked whether they had information about colorectal cancer screening programs, from which sources they accessed information about colorectal cancer screening methods, and whether they found the information provided on this subject sufficient. The colorectal cancer screening histories of the participants were questioned, and patients who did not undergo screening were analyzed for reasons. In addition, the participants were questioned in terms of colorectal cancer risk factors and it was investigated whether there was a difference in colorectal cancer screening behavior between people who were in the risk group and those who were not. To reach all these data, the questionnaire form was created by the researchers and filled out face-to-face for each participant. An informed consent form was filled out by all participants. The questions asked in the study form are listed in Table 1.

Table 1. The questionnaire form

1.Demographical properties	
Name/ surname	
Age	
Date of birth	
Employment status	
Educational status	
Marital status	Divorced/widow
	Married
	Single
Having child	Yes
	No
2. Questioning Risk Factors for Colorectal Cancer	
Do you smoke?	Yes
	No
Is there a family history of colorectal cancer in first degree relatives?	Yes
	No
Is there a family history of other cancer in the first degree relative?	Yes
	No
If yes, please specify which cancer.	
Have you ever had a bowel disease?	Yes
	No
If your answer is yes, please state the name of your disease.	Bowel Polyp
	Ulcerative Colitis
	Crohn's Disease
	Hemorrhoids
	Irritable Bowel Syndrome
	Other (Please Specify)
Height and Weight	
3. Awareness Level Survey on Colorectal Cancer Screening Program	
Do you know that early diagnosis can be made by screening for colorectal cancer?	Yes
	No
Could you please indicate which of the following cancer screening methods you have heard of and have knowledge of? You can tick more than one option	Stool occult blood test once a year
	Sigmoidoscopy examination once every 5 years
	Total colonoscopy method once in 10 years
Have you heard of the name “Cancer Early Diagnosis, Screening and Education Center (KETEM)” before?	Yes
	No
From which source did you learn about colorectal cancer screening? You can tick more than one option.	From the family doctor
	From an internist
	From a general surgeon
	From a gastroenterologist
	From KETEM posters
	From the media organs
	From my neighbors, my family, my surroundings
	Other (Please specify.)
Do you think the information about colorectal cancer screening is sufficient?	Yes
	No
At which age do you think colorectal cancer screening begins?	over 40
	over 45 years old
	over 50
	over 60 years old
Do you think colorectal cancer screening is a paid service?	It is paid
	It is not paid
4. Colorectal cancer screening information	
When was the last time you had a stool occult blood test?	In the last 1 year
	more than 1 year ago
	I have never done
If you have never done it, could you please indicate why?	I don't think I'm in the appropriate age range for this screening program
	I am not familiar with this scanning program.
	I did not have it done because I was afraid to give a stool test.
When was the last time you had a sigmoidoscopy or colonoscopy?	I have done it in the last 5 years
	I've had it done in the last 10 years
	I have never done
If you have never done it, could	I don't think I'm in the

you please indicate why?		appropriate age range for this screening program I am not familiar with this scanning program. I did not have it done because I was afraid to have a colonoscopy
After completing this questionnaire, would you consider making a KETEM appointment and entering the cancer screening program?		Yes No

KETEM= Cancer early diagnosis, screening and education center.

This study was evaluated by the Ethics Committee of Samsun Training and Research Hospital and approved ethically with the number GOKA/2021/15/2. The Declaration of Helsinki was complied with in the study.

2.1. Statistical Analysis

Study data were analyzed using the SPSS package program, Version 22 (IBM Corp, 2013). Normally distributed variables were expressed as mean ±standard deviation and non-normally distributed variables were expressed as median (lowest-highest). Chi-square and Fisher's exact tests were used to compare categorical variables between groups. A P-value below 0.05 was considered statistically significant.

3. Results

A total of 300 patients, 167 women and 133 men, who applied to the Internal Medicine outpatient clinic of Samsun Training and Research Hospital were included in the study. The mean age was 59.5 ± 12.2 years. The mean body mass index was 29.1±5.1 kg/m^2. Demographic data are summarized in Table 2.

The analysis and results of the questions evaluating the knowledge and awareness of the people participating in the study about colorectal cancer screening are summarized in Table 3.

Table 2. Demographics

Demographic data		N (%)
Gender	Female	167 (55.7)
	Male	133 (44.3)
Educational status	Not literate	40 (13.3)
	Primary school graduate	166 (55.3)
	Secondary school graduate	23(7.7)
	High school graduate	33 (11.0)
	Graduated from a university	33 (11.0)
	Higher education after university	5 (1.7)
Employment status	Active employer	85 (28.3)
	Not working	134 (44.7)
	Retired	81 (27.0)
Marital status	Married	257(85.7)
	Single	9 (3)
	Widow	34 (11.3)
Having a child	Yes	281 (93.7)
	No	19 (6.3)

Table 3. Knowledge level about colorectal cancer screening

	Yes n (%)	No n (%)
Did you know that early diagnosis can be made by screening for colorectal cancer?	194 (64.7)	106 (35.3)
Have you ever heard of the screening method with stool occult blood test once a year?	81 (27.0)	219 (73.0)
Have you ever heard of the screening method with sigmoidoscopy examination once in 5 years?	22 (7.3)	278(92.7)
Have you heard of the total colonoscopy method once in 10 years?	76 (25.3)	224 (74.7)
Have you ever heard of cancer early detection, screening and education centers (KETEM)?	191(63.7)	109 (36.3)
Do you think the information about colorectal cancer screening sufficient?	117(39.0)	183 (61.0)
Do you think colorectal cancer screening is a paid service?	24 (8.0)	276 (92)
From which source did you learn about colorectal cancer screening?	n (%)	
a. From my family doctor	59 (30.4)	
b. From an internist	43 (22.2)	
c. From a general surgeon	17 (8.8)	
d. From a gastroenterologist	19 (9.8)	
e. KETEM posters	37 (19.1)	
f. From press organs	53 (27.3)	
g. From my neighbors, my family, my surroundings	68 (35.1)	
h. Other	11 (5.7)	

While 64.7% of the patients stated that they knew that colorectal cancer could be diagnosed early by applying screening methods, it was seen that stool occult blood tests and colonoscopy were known at a similar rate. “Do you find the information about colorectal cancer screening sufficient?” It was seen that 61% of the participants answered “no” to the question. “After completing this questionnaire, would you consider making an appointment with KETEM and entering the cancer screening program?” 73.7% of the participants answered “yes” to the question.

Since the national cancer screening program recommends screening for colorectal cancer over the age of 50, the cancer screening rates of patients for this group were evaluated. 222 (74%) of the participants were 50 years and older. It was determined that 72 (32.4%) of these 222 people had colorectal cancer screening by any method. It was determined that 173 (77.9%) had never had a stool occult blood test, and 153 (68.9%) of them ticked the option “I do not know about this screening

program". It was determined that 177 (79.7%) participants had never had a sigmoidoscopy or colonoscopy, and 150 (67.6%) of them choose the option "I do not know about this screening program".

When the general colorectal cancer screening behavior over the age of 50 is analyzed according to gender, educational status, employment status, having a child, marital status, family history of colorectal cancer or another cancer, there is a statistically significant difference between women compared to men and non-smokers compared to smokers. It was found that they had more scans. It was also revealed that married people were more likely to comply with colorectal cancer screening than those living alone. Colorectal cancer screening was found to be significantly higher in first-degree relatives with a history of cancer and in those with a history of bowel disease (Table 4).

Table 4. The effect of risk factors and demographic characteristics on cancer screening behavior in patients over 50 years of age

	Screened for Cancer	Not screened for Cancer	P-value*
	n (%)	n (%)	
With at least one risk factor	44 (32.4)	92 (67.6)	
No risk factor	28 (32.6)	58 (67.4)	0.975
Smoker	4 (13.3)	26 (86.7)	
Non-smoker	68 (35.4)	124 (65.5)	0.016
Obese	34 (34.0)	66 (66.0)	
Normal weight	38 (31.1)	84 (68.9)	0.651
There is a family history of colorectal cancer in a first-degree relative	10 (38.5)	16 (61.5)	
There is not family history of colorectal cancer in a first-degree relative	62 (31.6)	134 (68.4)	0.485
There is a family history of any cancer in a first-degree relative	32 (43.2)	42 (56.8)	
There is not family history of any cancer in a first-degree relative	40 (27.0)	108 (73.0)	0.015
History of bowel disease	19 (52.8)	17 (47.2)	
Not a history of bowel disease	53 (28.5)	133 (71.5)	0.004
Gender			
Female	45 (39.8)	68 (60.2)	
Male	27 (24.8)	82 (75.2)	0.017
Marital status			
Married	56 (29.6)	133 (70.4)	
Single or widow	16 (48.5)	17 (51.5)	0.033
Educational status			
Secondary school and below	53 (31.4)	116 (68.6)	
High school and more	19 (35.8)	34 (64.2)	0.543

* Data of 222 patients over 50 years of age were analyzed with the chi-square test.

4. Discussion

It has been accepted that a routine screening program should be applied to diagnose colorectal cancer early and to prevent mortality due to this disease. According to both the United States and European guidelines, screening for colorectal cancer is recommended for every adult from the age of 50 (Lansdorp-Vogelaar and Von Karsa, 2012; Cronin et al., 2018; Davidson et al., 2021). It is recommended that individuals with high risk such as familial polyposis be screened starting from an earlier age and following certain algorithms. In our country, colorectal cancer screening is carried out through the Cancer Early Diagnosis, Screening, and Education Center (KETEM). Again, screening for colorectal cancer with stool occult blood is recommended for individuals over the age of 50 who are followed up in family health centers. This study, it was aimed to measure the general knowledge levels and tendencies of patients over the age of 40 who applied to the Internal Medicine clinic about colorectal cancer screening. The reason for choosing the age of 40 as the limit in our study is that there are opinions on screening can start at an earlier age due to the increasing number of young colorectal cancer cases (Dozois et al., 2008).

In our study, although the rate of those who answered "yes" to the question "Do you know that early diagnosis can be made by screening for colorectal cancer?" was 64.7%, the rate of those who knew stool occult blood test and colonoscopy was found to be low (27% and 25.3%, respectively). Moreover, the sample set for this study consisted of adults over the age of 40, and nearly two-thirds of the participants were over the age of 50. This

suggests that the patients who applied to our center for colorectal cancer screening do not have enough information. The rate of those who had general knowledge about KETEM was 63.7%.

In our study, there were 222 people over the age of 50. It was determined that only 72 (32.4%) of these 222 people had colorectal cancer screening by any method. It was determined that 173 (77.9%) of them had never had a stool occult blood test and 177 (79.7%) of the participants had never had a sigmoidoscopy or colonoscopy. In a study in which breast, colon, and cervical cancer screening rates were questioned in Türkiye, the rate of having at least one mammography over the age of 50 was 48.2%, and the rate of having at least one colonoscopy over the age of 50 was 12%. In the same study, it was revealed that having knowledge about the national cancer screening program and knowing where the cancer screening was carried out was effective in screening behavior (Gulten et al., 2012).

In a study examining the effect of health literacy on cancer screening behavior, it was revealed that as health literacy increases, the tendency to not screen for colorectal cancer increases10. In the same study, the colorectal cancer screening rates in the general population were also found to be 21.1%, which was found to be consistent with our study (Pancar and Mercan, 2021). In a recently published study by Tekiner et al. (2021) indicated that the colorectal cancer screening attitude of adults between the ages of 18 and 50 was investigated and it was determined that 58.1% of the participants answered "yes" to the statement “a colonoscopy should be performed every 10 years over the age of 50”. Here, the effects of sociodemographic characteristics such as educational status, marital status, and employment status on colon cancer screening behavior were examined. In this study, whose average age was younger (35.4 years), it was observed that people were informed about the subject, and their opinions were asked. In our study, it is questioned how much information people have about the screening program. When the results of both studies are interpreted together, the importance of informing people close to the screening program becomes evident.

In another recent study, the effect of informing the participants about the screening issue and reminding them was investigated, and it was revealed that the reminded group had more compliance with the screening program (Ahmed et al., 2023). In the same study, when married and unmarried (separated, divorced, or widowed) were evaluated in terms of compliance with the screening program, it was determined that the second group had lower screening compliance. In our study, similar to the aforementioned study, it was found that married people were more likely to comply with the colorectal cancer program.

Although cancer screening has become widespread in developed countries, it has been shown that socioeconomic level affects the rates of reaching screening methods and having cancer screening (Sicsic and Franc, 2014; McCowan et al., 2019; Brown et al., 2021). In a study conducted in Japan, it was shown that those who do not regularly work in an active job participate in cancer screenings at a lower level than those who work regularly, and this is especially evident for colorectal cancer screening (Ishii et al., 2023). In our study, the group that is actively employed or retired and has government insurance and the group that does not have a regular working life were compared in terms of compliance with colorectal cancer screening, and no statistically significant difference was found between the two groups (P=0.223). However, the fact that the insurance status of the non-working group was not questioned is among the limitations of our study. For this reason, we think that there is a need for new studies that will investigate the effect of active employment or active insurance status on cancer screening behavior in Türkiye.

In a study investigating the level of colorectal cancer screening among general surgery specialists in our country, it was found that 74 of 156 general surgeons over 50 years of age had colorectal cancer screening, preferably with colonoscopy. In other words, even among the physicians of a branch that is so closely related to the diagnosis and treatment of colorectal cancer, more than half of them do not comply with the screening program themselves (Celik et al., 2019).

Türkiye is among the countries where the incidence of colorectal cancer according to age increases gradually under the age of 50, and the incidence of colorectal cancer under the age of 50 in Türkiye has been shown as 5.9 per 100000 (Globocan, 2020). Despite this, in a study conducted in our country, the awareness of colorectal cancer screening was found to be 25.4% (Zafer et al., 2017). In our study, both colorectal cancer screening awareness and cancer screening rates were found to be low in line with the literature.

We believe in that the results we obtained in this study are important because the level of knowledge of people in the age range close to the colorectal cancer screening program was evaluated. It was determined that the most obvious reason for the patients in this group not to be screened was their insufficient knowledge about the subject. This finding suggests that the announcement and information of the national colorectal cancer screening program should be done more effectively. It was seen that 61% of the participants answered “no” to the question

“Do you think that the information about colorectal cancer screening is sufficient?”. 73.7% of the participants answered “yes” to the question “After completing this questionnaire, would you consider making an appointment with KETEM and entering the cancer screening program?”.

We think that it is important to question colorectal cancer screening information and to encourage patients for colonoscopies, especially patients over 50 years of

age who apply to the internal medicine outpatient clinic for other reasons. Because among the participants, 68.9% of those who did not have stool occult blood tests stated that they did not have this procedure because they did not know, while this rate was 67.6% in those who did not have a colonoscopy. 8.6% of the participants stated that they did not have a colonoscopy done because they were afraid of the procedure. We think that the guidance and support of the physician will help overcome this barrier.

The most important limitation of our study is that the adequacy of the number of participants to represent the population has not been demonstrated. However, all individuals over the age of 40 who applied to our center for 3 months and agreed to fill out the form were accepted. When we look at the demographic characteristics, it is observed that a homogeneous group is formed in terms of age, marital status, employment status, and risk factors. Again, the rates of screening over the age of 50 that we obtained were found to be compatible with the literature. Therefore, we think that the findings represent general population data.

5. Conclusion

This study reveals that patients over the age of 40 who applied to our center do not have enough information about the colorectal cancer screening program, and the participation of individuals over the age of 50 in the cancer screening program is very low. We think that it is important to encourage all adults over the age of 50 who apply to the family medicine and internal medicine outpatient clinics to the colorectal cancer screening program and to inform individuals over the age of 40 about colorectal cancer screening at least once.

Author Contributions

The percentage of the author(s) contributions is presented below. All authors reviewed and approved the final version of the manuscript.

	D.S.K.Ö.	E.D.E.	A.U.E.	M.D.D.
C	100			
D	100			
S	100			
DCP		50	50	
DAI	50			50
L	25	25	25	25
W	25	25	25	25
CR	60	10	10	20
SR	25	25	25	25
PM	25	25	25	25

C=Concept, D= design, S= supervision, DCP= data collection and/or processing, DAI= data analysis and/or interpretation, L= literature search, W= writing, CR= critical review, SR= submission and revision, PM= project management.

Conflict of Interest

The authors declared that there is no conflict of interest.

Ethical Approval/Informed Consent

This study was approved by Ethics Committee of Samsun Training and Research Hospital (approval date: February 15, 2021, protocol code: GOKA/2021/15/2).

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