

Research Article

Márton István Dénes, Valentin Nădășan*, Călin Molnar, Șerban Bancu, Cristian Oliviu Borz, Zoltán Ábrám

Is awareness enough to bring patients to colorectal screening?

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Abstract: Background: The aim of the study was to assess the awareness of colorectal cancer (CRC) patients about CRC screening methods and to investigate the relationship between awareness, socio-demographic characteristics and the stage in which patients with CRC are diagnosed.

Methods: The observational cross-sectional study included 275 CRC patients admitted between 2014 and 2016 to two surgical clinics from Tîrgu Mureș, Romania. Study variables were collected via face-to-face interview and from patients' observation sheets.

Results: Only 41.5% of the patients heard about cancer screening and 6.5% about specific CRC screening methods. Mass-media was the major source of information (85.1%) followed to a much lesser extent (14.9%) by family, friends, and colleagues. Health professionals did not contribute at all to informing patients about screening methods. Awareness about screening methods was statistically associated with the patients' residence, age, and educational achievement, but not with the stage of CRC.

Conclusion: The level of awareness of CRC screening methods was very low among the CRC patients included in the study but it could not predict the stage in which malignancy was diagnosed, suggesting that awareness

alone is not enough to bring patients to undergo early CDC screening procedures.

Keywords: Colorectal cancer screening; Sources of learning about screening; Educational level; Romania

1 Introduction

Colorectal cancer (CRC) is a major public health problem and is responsible for about 8% of all death cases caused by cancer [1]. There are approximately 1.36 million new cases diagnosed annually, and approximately 694,000 people die due to colorectal cancer [2]. CRC accounts for 10% of all cancers in males (ranking third as frequency) and for about 9.2% in females (second place as frequency) [2]. CRC has an uneven global distribution, with an increased incidence in developed and highly industrialized countries (USA, Western Europe, Australia and New Zealand) where the age-standardized incidence rate exceeds 40/100,000 inhabitants compared to an incidence of fewer than 4/100,000 inhabitants in less developed or developing countries [1-4]. In the US, it is estimated that about 6% of the population will develop this type of neoplasm and half of these people will die due to this disease [5].

Since 1975, it has been reported an increase in the number of new cases, explained either by a real increase in the number of new cases or by an improvement in the means of diagnosis, reported all over the world [6]. It is estimated that incidence rates could increase dramatically over the next decade, most of which will be in developing countries [7]. There has been a significant increase in the incidence of CRCs in countries with a low incidence of the disease in the past such as Hong Kong, Taiwan, Singapore, China, Iran [8,9]. CRC incidence has increased dramatically in the last decades in former communist countries in Eastern Europe that have recently undergone a major economic transition [4]. The incidence rate in these countries equaled or even exceeded

*Corresponding author: Valentin Nădășan, Department of Hygiene, University of Medicine and Pharmacy Tîrgu Mures, Romania Email: valentin.nadasan@umftgm.ro. Phone (institutional): +40-265-215551; Fax: +40-265-210407. ORCID ID: orcid.org/0000-0003-0068-3772

Călin Molnar, Department of Surgery 1, University of Medicine and Pharmacy of Tîrgu Mures, Tîrgu Mures 540139, Romania

Márton István Dénes, Șerban Bancu, Cristian Oliviu Borz, Department of Surgery 2, University of Medicine and Pharmacy of Tîrgu Mures, Tîrgu Mures 540139, Romania

Zoltán Ábrám, Department of Hygiene, University of Medicine and Pharmacy of Tîrgu Mures, Tîrgu Mures 540139, Romania

the values recorded in developed countries. In 2012, the standardized incidence rate of CRC was 42.7 in Slovakia, 42.3 in Hungary and 38.9 in the Czech Republic (per 100 000 inhabitants, both sexes) being the highest in Europe [10]. In Romania, we are witnessing a worrying increase in the incidence of CRC, which almost doubled in a decade (13/100,000 inhabitants in 1994, 25/100,000 inhabitants in 2005). Annually, 9,000 new cases are being reported (second place as frequency after lung cancer) in both sexes, of which approximately 5000 people die from this disease. The incidence of CRC is higher in the counties located in the west of Romania compared to those located in the east [11]. Epidemiological studies performed in the Far and Middle Eastern countries have reported an increase in incidence among young people, while the rate remains relatively low in older people, suggesting recent changes in the exposure of this category to environmental risk factors [3]. In the US, the incidence of colon cancer increased annually by an average of 1-2.4% in people aged 20 to 40 and by 0.5-1.3% in people aged 40 to 55. This trend has been observed constantly since 1980. Thus, it is estimated that a person born in 1990 has double the risk of colon cancer and quadruple the risk of rectal cancer compared to those born in 1950 [12].

Screening provides a better prognosis allowing the detection of neoplastic tumors in early stages and less traumatic surgical interventions for the patient [3,4,12,13]. Multiple randomized controlled trials revealed an approximately 16% reduction in colorectal cancer mortality with annual or biennial fecal occult blood testing (FOBT), followed by colonoscopy for positive FOBT, after a longitudinal, 12 - 18 years follow-up [14].

Besides conventional screening methods such as FOBT, flexible sigmoidoscopy, colonoscopy, and double-contrast barium enema examination, new methods of investigation, such as immunochemical tests (fecal immunochemical test), high-sensitivity FOBT, guaiac-based FOBT (gFOBT), DNA stool test, virtual colonoscopy (CT colonography) are available. These new methods with better sensitivity and similar specificity to FOBT (Hemocult) may be reasonable options for screening programs. Virtual colonoscopy can detect colon adenomas and tumors as well as colonoscopy [15].

On another line of inquiry, modern medicine is constantly looking for new molecules that can be used as a tumor marker. With the discovery of alpha-fetoprotein, a new era in oncology began [16]. A number of tumor markers such as carcinoembryonic antigen, prostate-specific antigen, CA 19.9, CA 125, alpha-fetoprotein, have been identified. Unfortunately, except for the prostate-specific antigen (PSA), all the other markers have shown low sensi-

tivity and specificity and thus their usefulness as a screening method is considered of no practical significance [17].

According to the latest report of the International Agency for Research on Cancer regarding cancer screening in the European Union, Romania, together with Bulgaria and Slovakia, was among the countries that had not initiated a population-based screening program for CRC [18] until 2015 and so far no data have been published on the awareness and attitudes of Romanian patients with CRC on screening technologies.

The study aimed to 1) assess the awareness and sources of information of Romanian patients with CRC about cancer and CRC screening, and 2) investigate the socio-demographic and awareness related predictors of the stage in which patients with colorectal cancer are diagnosed.

2 Methods

The cross-sectional observational study included patients diagnosed with colorectal neoplasms admitted to Surgical Clinic I and II from Tîrgu Mureş between 1st September 2014 and 1st March 2016. Data on socio-demographic and screening characteristics were collected via face-to-face interview of patients during hospitalization, usually prior to surgery. Data concerning surgery, respectively the result of the histopathological examination were extracted from patients' observation sheets as they became available. The study was conducted with the approval of the Ethics Committee of the University of Medicine and Pharmacy Tîrgu Mureş and with patients' written consent. Besides socio-demographic data, pathological personal history and heredo-collateral antecedents the questionnaire included the following screening questions:

Q1) Are you aware of/have you heard about cancer screening methods? a) Yes; b) No

Q2) Do you know any colorectal cancer screening methods? a) Yes; b) No

Q3) In case you know/have heard about screening methods, where did you learn about them? a) from people around you: family, friends, colleagues; b) from the healthcare provider; c) from the media; d) within the formal education process; e) from another source.

Q4) Would you have participated in a colorectal screening program if you have had enough information about these methods? a) Yes; b) No

After data centralization, descriptive statistics were calculated based on socio-demographic characteristics and patients' responses to the questions. We used multiple logistic regression in order to identify the predictors of patients answers to each of the four surveyed questions and the predictors of CRC stage at diagnosis using the SPSS statistical software version 22. The statistical significance threshold was set to $\alpha = 0.05$.

3 Results

During the research period, 286 patients were hospitalized and underwent surgery for colorectal tumors in Surgical Clinic I and II in Tîrgu Mureş. Of these, 6 declined to participate in the study and 5 were excluded because the histopathological examination did not confirm the presence of a malignant process. The analytical sample included 275 patients. The mean age of the patients was 64.7 years ($SD \pm 11.1$), 65.5% male and 34.5% female; 54.9% came from the urban environment and 45.1% from the rural one. In terms of formal education, 14.5% had elementary education, 16% completed secondary education, 24.4% had vocational education, 22.5% had high school education, 12.4% had post-secondary studies and 10.2% graduated from a higher education institution. Depending on the location, in 46.9% of the patients the tumor was located at the level of the caecum, ascending, transverse, descending or sigmoid colon, and in 53.1% of the patients, it was located at the level of the rectum. Patient classification based on the histopathological examination according to the stage of the tumor showed that 4.39% of the cases were stage T1, 8.77% stage T2, 63.6% stage T3 and 23.2% stage T4. Regarding local and regional lymph node metastasis, the results showed that 48.2% were with stage N0, 29.8% with stage N1, 21.1% with stage N2 and 0.88% with stage N3. Only 14.9% of the patients presented remote metastases, 12.0% were diagnosed with stage I, 34.9% in stage II, 38.5% with stage III and 14.5% with stage IV.

Of the 275 patients, 41.5% were aware of the existence of certain methods for early detection of cancer, but only 2.5% were aware of what "screening" technique really means, as all of them were medical graduates. 6.5% of patients reported being aware of a CRC screening method. 85.1% of patients learned about these screening methods from the media (television, newspapers) and 14.9% from people around them (family, friends, peers). None of the

patients have obtained the information from the family physician or other healthcare providers. Most patients (82.9%) reported that they would have participated in a colorectal screening program if they had been aware of this possibility of cancer detection.

None of the patients participated in a CRC screening program. A number of 227 (82.5%) benefited from colonoscopy after the onset of certain symptoms. Of these, 146 patients (64.3%) underwent colonoscopy on the recommendation of the family physician. Having postsecondary or university education was a significant predictor of being aware of general and CRC screening methods, urban residence was a significant predictor of awareness about cancer screening in general, and being younger than 65 years was a significant predictor of awareness about CRC screening methods (Table 1). Neither the tested socio-demographic characteristics nor the awareness related factors were found to be significant predictors of CRC stage at diagnosis (Table 2).

4 Discussion

As far as we know, our study is the first one to investigate the awareness of Romanian patients with colorectal cancer about screening methods. Our study highlighted that less than half of the patients (41.5%) was aware of the ways to detect cancer in general and less than 1 in 10 patients (6.5%) knew about methods for CRC screening. According to the responses given by the patients, media was the major source of information (85.1%) followed to a much lesser extent (14.9%) by the interpersonal factors (family, friends and colleagues). Surprisingly, health professionals from the primary or secondary health care system did not contribute at all to informing patients about screening methods. More than half (53.0%) of the patients with CRC included in the studied sample were diagnosed in stages III and IV.

Data analysis highlighted statistically significant associations between awareness about screening, level of education, residence, and age. Patients from urban areas, those with higher-education, and age under 65 years were more likely to have been informed about cancer screening and colorectal cancer screening than those from rural areas, those with lower education level, and older age. On the other hand, the analysis was not able to identify any socio-demographic characteristics or awareness related factors as predictors of early stage CRC at diagnosis in the interviewed patients. This report suggests that awareness about screening methods, although considered essential,

Table 1: Socio-demographic predictors of awareness about screening methods, sources of information, and patients' attitude towards participation in screening programs

Variable		OR (95% CI)			
		Q1 (N=275)	Q2 (N=275)	Q3 (N=114) ^a	Q4 (N=161) ^b
Age	<65 years	1.24 (0.74-2.08)	3.12* (1.05-9.25)	1.54 (0.54-4.36)	0.50 (0.21-1.19)
	≥ 65 years	Ref.	Ref.	Ref.	Ref.
Sex	male	0.73 (0.43-1.26)	0.62 (0.21-1.89)	0.49 (0.17-1.40)	1.29 (0.53-3.17)
	female	Ref.	Ref.	Ref.	Ref.
Residence	urban	2.60* (1.53-4.40)	1.97 (0.59-6.56)	1.15 (0.37-3.59)	2.10 (0.83-5.32)
	rural	Ref.	Ref.	Ref.	Ref.
Education	higher	1.90* (1.03-3.50)	6.32* (2.18-18.28)	0.88 (0.28-2.75)	1.91 (0.40-9.20)
	lower	Ref.	Ref.	Ref.	Ref.

Q1: Aware / not aware of cancer screening methods

Q2: Aware / not aware of colorectal cancer screening methods

Q3: Source of awareness about screening methods

Q4: Willing / not willing to participate in a colorectal screening program

Ref.: Reference group

^a Only patients who responded affirmatively to Q1 or Q2 were included^b Only patients who responded negatively to Q1 and Q2 were included

* Significant (at p < 0.05)

Table 2: Socio-demographic and awareness related factors tested as predictors of colorectal cancer stage at diagnosis

Variable		OR (95% CI)
Age	<65 years	1.04 (0.64-1.70)
	≥ 65 years	Ref.
Sex	male	0.79 (0.47-1.32)
	female	Ref.
Residence	urban	1.17 (0.70-1.94)
	rural	Ref.
Education	higher	1.00 (0.54-1.85)
	lower	Ref.
Question 1	aware of cancer screening methods	0.94 (0.56-1.59)
	not aware of cancer screening methods	Ref.
Question 2	aware of CRC screening methods	0.90 (0.32-2.54)
	not aware of CRC screening methods	Ref.
Question 3 ^a	learned about screening methods from television, newspapers	0.52 (0.18-1.54)
	learned about screening methods from family, friends, peers	Ref.
Question 4 ^b	willing to participate in CRC screening program	0.77 (0.33-1.80)
	not willing to participate in CRC screening program	Ref.

Ref.: Reference group

^a Only patients who responded affirmatively to Q1 or Q2 were included^b Only patients who responded negatively to Q1 and Q2 were included

is not enough to determine people to participate in screening programs in due time. A number of other factors such as embarrassment, lack of information, socioeconomic problems, concerns regarding masculinity and hygienic considerations, significantly limit the adoption of the main screening methods [18, 19]. Even cheaper fecal tests are perceived as unhealthy by some patients [18]. The limited level of general and health literacy can be an important factor in limiting people's participation in CRC screening programs. Knowledge, attitudes, and opinions about CRC screening vary according to the level of literacy [19, 20].

According to a study performed in 2004 in 21 European countries, 51% of the surveyed population was aware of simple screening tests [21]. Although the methodological differences between our study and Keighley's study do not allow a rigorous comparison of the results, our results suggest that the level of awareness of CRC screening methods for patients in Romania is low compared to other European countries. In the US, Shokar et al have shown that most subjects had difficulty in explaining what screening was when they were asked to do so, and none of the respondents realized that the purpose of screening is to detect the disease before the symptoms [22]. Also, participants' knowledge about CRC screening was particularly deficient especially among the minority population [22]. With reference to information sources, the same study highlighted that most of the people included in the study learned about cancer from friends or acquaintances, seldom from the media, and very few from their physician [22].

Our results on the association between awareness and the level of education are similar to those of other authors. A study performed in Spain has shown that 65.7% of the population was aware of colonoscopy as a screening method and that the level of awareness was lower in people with low socioeconomic and educational level [23]. In the US, a study carried out by Shokar et al suggests that the level of knowledge about CRC screening is lower among minority populations (African-American and Hispanic) [22].

Our study presents limitations inherent to cross-sectional questionnaire-based observational studies as well as those due to non-probability sampling. First, the cross-sectional design of the study limits causal inference. Second, the patient recruitment relied exclusively on their spontaneous presentation to the hospital, and thus, makes it impossible to determine the level of generalization of our findings to the whole CRC patients in the coverage area of the hospital. Third, self-reported data are subject to recall and social desirability bias. In order to mitigate

misunderstandings of the questions, the questionnaire was applied in a face-to-face setting. Despite these limitations, our study draws attention to a major public health problem in Romania, namely the low level of awareness of screening methods for cancer in general and for CRC in particular. Future studies performed on representative samples could provide more useful information for developing CRC screening programs in Romania.

5 Conclusion

The level of awareness of CRC screening methods was very low among the CRC patients included in the study but it could not predict the stage in which malignancy was diagnosed, suggesting that awareness alone is not enough to bring patients to undergo early CDC screening procedures. Our investigation has shown also that very few patients were introduced to CRC screening methods by health professionals, and thus reveals the need for the health professionals' involvement in CRC screening educational programs that go beyond mere awareness raising.

Conflict of interest: The authors have no conflict of interest to declare.

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