

# Knowledge and Awareness of Colorectal Cancer

## Authors' Contribution:

A – Study Design  
B – Data Collection  
C – Statistical Analysis  
D – Data Interpretation  
E – Manuscript Preparation  
F – Literature Search  
G – Funds Collection

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## ABSTRACT:

**Introduction:** Colorectal cancer (CRC) is the third most common malignancy in men and the second most common in women. The disease constitutes a significant civilization and social problem.

**The aim:** The aim of the study is to assess the study group's awareness and knowledge about CRC, as well as about its diagnostics and treatment.

**Material and methods:** An online questionnaire form was distributed in the study group regarding issues related to CRC, and followed by statistical analysis and interpretation of the obtained survey results.

**Results:** After analysis, we found that a significant percentage of the surveyed sample group had basic knowledge and awareness in the area of CRC, whereas about half of the respondents did not consider themselves sufficiently informed about the disease.

**Conclusions:** Considering the scale of the problem posed by CRC, it is necessary to undertake broader action to promote knowledge about this disease and to carry out this type of research on a larger and more socioeconomically diverse population.

## KEYWORDS:

awareness, colon cancer, colonoscopy, colorectal cancer, rectal cancer, stomy

## ABBREVIATIONS

CRC – Colorectal Cancer

## INTRODUCTION

According to the data of the National Register of Colorectal Cancer (CRC), colorectal cancer is the third most common malignant neoplastic disease in men and the second one in women [1, 2]. More than half of CRC cases occur in developed countries [3]. Colorectal cancer causes 8% of cancer deaths worldwide [3]. According to the foregoing data, it is clear how significant of a civilization and social problem the CRC is.

It is best to detect the disease at the earliest possible stage, before the tumor enters the locoregional progression stage or develops metastases. A vast majority of CRC cases (>90%) are sporadic, and the relationship of CRC with the presence of adenomatous polyps from which cancer can develop has been documented for many years. The role of colonoscopy, which combined with histopathological examination allows the diagnosis of CRC, as well as the removal of polyps and some low-grade forms of CRC has to be mentioned here. It is worth noting that at the time of diagnosis, 20% of patients with CRC have metastases in or outside the liver [4]. Such a high percentage of advanced forms of cancer at the time of diagnosis may indicate that screening programs are not effective. This problem may be caused by insufficient public knowledge and awareness of colorectal cancer. This is confirmed by a paper by Hee-Soon Juon et al., which has shown that the low level of knowledge about CRC and screening in the surveyed population translates into unsatisfactory results of early detection programs for CRC [5]. Education on prevention and treatment of CRC among people over 50 years of age required particular attention.

Popularizing general knowledge of CRC and its detection methods among the population, as well as an increased awareness of the risks it poses, is extremely important to improve the detection of this disease, especially in its early stages, which directly translates into improved treatment results.

## AIM OF THE STUDY

The aims of this paper include:

1. Evaluation of awareness and general knowledge about colorectal cancer in the study group;
2. Evaluation of knowledge about the diagnostics and treatment of colorectal cancer in the study group.

## MATERIAL AND METHODS

The study was conducted using an online survey form. The study was approved by the Institutional Review Board of the Medical University of Lodz (No. RNN/252/17/KE of 11th July 2017). The form was distributed through social media sites, e-mail and Internet forum boards. The online questionnaire included questions concerning: age, sex, education, relationship between work and medicine, place of residence, material status and marital status of the respondents, as well as knowledge about symptomatology and treatment of colorectal cancer, knowledge about colonoscopy and opinions about this study. The questionnaire also included questions concerning intestinal stoma, diet and the effect of acetylsalicylic acid at low doses on colorectal cancer. The study was conducted from July 2017 to May 2019. A total of 168 completed questionnaires were returned. Eighteen of the respondents were doctors;

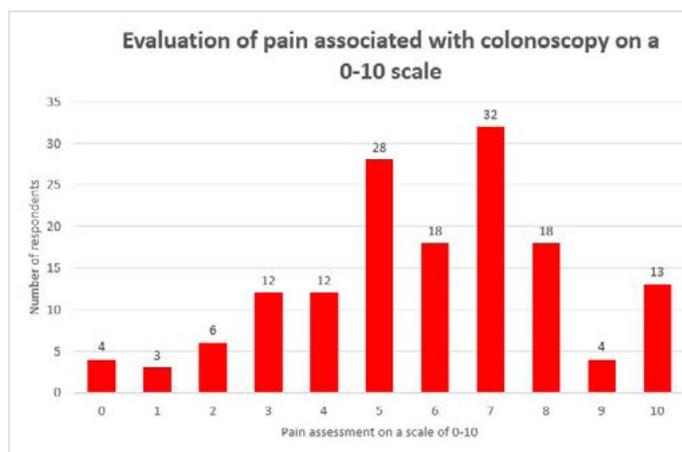


Fig. 1. Evaluation of pain associated with colonoscopy in the entire study group.

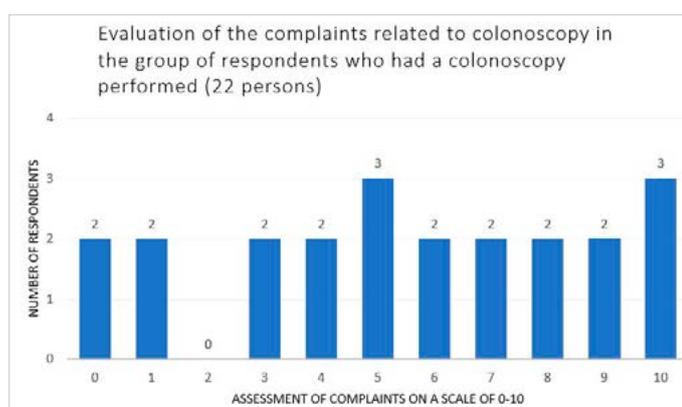


Fig. 2. Evaluation of complaints related to colonoscopy in persons who have had colonoscopy.

these people, being professionals with broad medical knowledge, were excluded from the survey. Finally, 150 people were included in the study and all further calculations and considerations apply to this group.

## RESULTS

The analysis included 150 people between the age of 17 and 68 years. The structure of the study group is presented in Tab. I. The results of the survey are presented in Tab. II. and in Fig. 1.–6. The following section provides an overview of the complementary data contained in the tables and figures.

Moreover, based on the analysis of the collected material, it was found that the main source of knowledge about CRC in the study group is the Internet. As many as 53% of the respondents (79 individuals) marked this answer in the multiple-choice question, while 27% (41 individuals) stated that they did not use any sources of knowledge about CRC. A vast majority of respondents, as many as 86.6% (129 individuals) never had any CRC examination and 85.3% (128) never had a colonoscopy. Almost all respondents (97.3% – 146 cases) thought they knew what colonoscopy was, while 93.3% of the respondents (140 cases) selected a correct definition of colonoscopy from the available options in the question checking whether the surveyed person has significant knowledge and understanding of colonoscopy. One of the questions in the survey concerned the concerns about colonoscopy. A multiple choice question was

used in this case. Slightly more than half of the respondents, 56% (84 cases) indicated that they were afraid of pain during the examination, while 46% (69) were ashamed and embarrassed about performing colonoscopy. As many as 26% of respondents (39) indicated being concerned about perforation of the large intestine during the examination, while 18% (27) had no concerns.

The majority of respondents asked to assess the discomfort/pain associated with colonoscopy on a scale from 0 to 10 (0 – no ailments, 10 – unbearable ailments) gave marks between 5–8 (64% – 96 individuals). As many as 18.7% (28) pointed to number 5 and 12% (18) to 6. The highest number of respondents, 21% (32) indicated a score of 7, while 12% (18) indicated a score of 8. The maximum score (10) was given by 8.7% of the respondents (13).

Among the ailments/complications mentioned by the respondents, which in their opinion could potentially be associated with colonoscopy, the most frequently indicated were: rectal bleeding (50% – 75), abdominal pain (38.6% – 58), abdominal bloating (24.6% – 37), intestinal perforation (18.6% – 28).

The difference in the assessment of complaints related to colonoscopy was also analyzed by dividing the respondents into two subgroups, i.e. the subgroup that had this examination performed (22 individuals, constituting 14.7%) and the subgroup that never had colonoscopy (128 individuals – 85.3%). This comparison is shown in Figure 2 and 3. In the first subgroup, the severity of colonoscopic ailments was estimated at 5 points or less by 50% of respondents (11 cases), while in the second subgroup by 42.1% of respondents (54 cases). On the other hand, maximum pain (10 points) was indicated by 13.6% of respondents (3 individuals) from the first subgroup, and 7.8% of respondents (10 individuals) from the second subgroup.

In the group of respondents who would agree to have colonoscopy performed in case of being informed by the doctor about the necessity of this examination, in the multiple choice question, the most frequently indicated justifications for the decision included: possibility to detect colorectal cancer during the examination (70% – 105 cases); possibility to remove the lesions from which colorectal cancer could develop (42% – 63) and belief that performing colonoscopy may protect against CRC (43.3% – 65). In case of a doctor indicating the need for repeated colonoscopy, 55.3% of respondents (83) would undergo the examination only under anesthesia, just 8.7% (13) would agree to have no anesthesia, and 33.3% (50) would agree to have the examination repeated regardless of being provided with anesthesia or not. As many as 3.3% of respondents (5 persons) would refuse to undergo repeated colonoscopy.

According to 62% (93 individuals) of the respondents, a patient who had surgery due to CRC requires medical follow-up for the rest of his/her life, 14% (21) believed a 5-year post-operative follow-up period was sufficient, and another 14% (21) had no opinion on this issue.

The majority of respondents (64.7% – 97 cases), when asked if they knew what screening was, were convinced that they knew and understood the term, but when asked in the next question to select the most accurate definition of screening, only 42% of respondents (63 people) indicated the correct definition; 24.7%

Tab. I. Structure of the study group.

SEX	male	female				
	40 (26.7%)	110 (73.3%)				
EDUCATION	primary	vocational	moderate	higher		
	3 (2%)	3 (2%)	41 (27.4%)	103 (68.7%)		
IS THE RESPONDENT PROFESSIONALLY RELATED TO MEDICINE?	no	non-university medical school	paramedic, midwife, nurse	pharmacist/biotechnologist/medical analyst	another medical profession	medical student
	121 (80.7%)	1 (0.7%)	9 (6.0%)	4 (2.7%)	4 (2.7%)	11 (7.3%)
PLACE OF RESIDENCE	large city >200 thousand inhabitants	smaller city (50–200 thousand inhabitants)	small town (< 50 thousand inhabitants)	rural areas		
	97 (64.7%)	17 (11.3%)	17 (11.3%)	19 (12.7%)		
COUNTRY OF RESIDENCE	Poland	Another country				
	147 (98%)	3 (2%)				
MARITAL STATUS	married	in an informal relationship	widow/widower	divorced	not in a relationship	
	76 (50.7%)	28 (18.7%)	1 (0.7%)	8 (5.3%)	37 (24.7%)	
ASSESSMENT OF OWN MATERIAL STATUS, EARNINGS	well above the national average	above the national average	close to the national average	below the national average	well below the national average	
	8 (5.3%)	32 (21.3%)	47 (31.3%)	42 (28.0%)	21 (14.0%)	

(37 people) admitted to not knowing which answer was true, the rest of them indicated incorrect answers.

In the multiple-choice question, in which possible CRC symptoms had to be indicated, the most frequently indicated answers included:

- „presence of blood and/or clots in stool, rectal bleeding” – 94% of respondents (141 cases);
- „change of stool appearance” – 69.3% of respondents (104);
- „weight loss” – 65.3% of respondents (98);
- „alternating diarrhea and constipation” – 62% of respondents (93);
- „abdominal pain” – 58% of respondents (87).

In the question about the age at which colonoscopy should be performed in a person not at risk of serious diseases, 30% of respondents (45 individuals) indicated the range between 40 and 50 years, and 28.7% indicated the range between 50 and 60 years.

## DISCUSSION

The basic condition for effective treatment of CRC is its early detection. At this point, it is important to emphasize the enormous role of population's knowledge and awareness in terms of symptoms and detection of CRC [6, 7]. Inoshima et al. [8] demonstrate that a higher level of knowledge on this disease increases the likelihood of agreeing to undergo colorectal cancer screening tests. In the era of easily accessible medical information via the Internet, the press, as well as other media, there may be a certain concern aroused by the fact that more than half of the surveyed population does not consider themselves aware and informed about CRC. Moreover, 55.3% of the respondents stated that they never sought information about this disease. The Internet should play an important role in promoting knowledge about CRC and its treatment today. Kim et al. have demonstrated that short information videos distributed

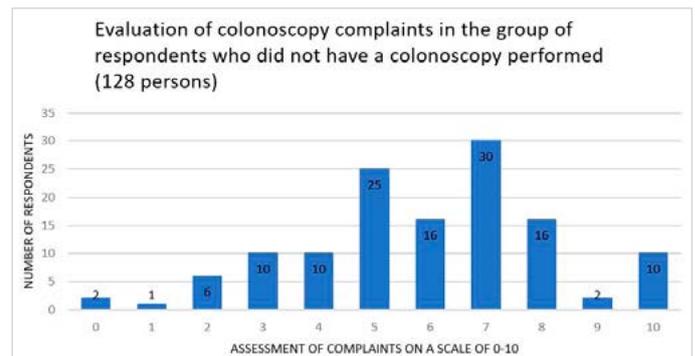


Fig. 3. Evaluation of complaints related to colonoscopy in persons who have not had colonoscopy performed.

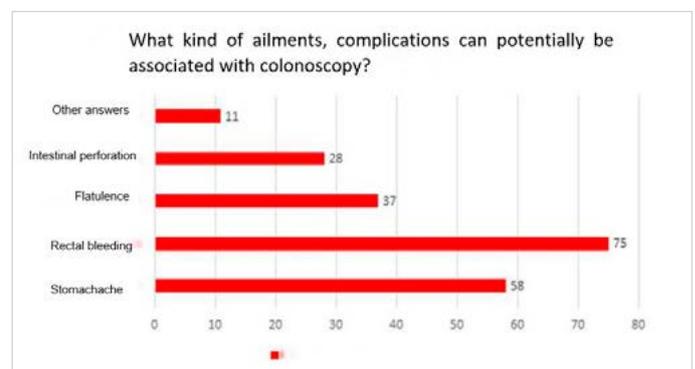


Fig. 4. Ailments/complications which, according to the respondents, may be related to colonoscopy.

via the Internet in the pre-operative period significantly reduce concerns about the planned CRC treatment [9]. Moreover, developing appropriate materials for patients, helping them in better and more conscious participation in the therapeutic process (the so-called Decision Aids) [10], could noticeably improve the situation of CRC patients, from increased reporting to screening programs, to seeking medical attention as early as possible.

Tab. II. Survey results.

TAB. II. – SECTION 1.: KNOWLEDGE AND VIEWS OF RESPONDENTS ON COLORECTAL CANCER					
QUESTION	DEFINITELY NOT	RATHER NOT	NEITHER POSITIVE NOR NEGATIVE	RATHER YES	DEFINITELY YES
Do you consider yourself an informed person, with awareness of the colorectal cancer?	23 (15.3%)	57 (38.0%)	16 (10.7%)	46 (30.7%)	8 (5.3%)
According to your knowledge, is there a proven link between the presence of adenocarcinoma polyps in the large intestine and the possibility of colorectal cancer development?	0 (0.0%)	3 (2.0%)	74 (49.3%)	46 (30.7%)	27 (18.0%)
Do you think that colorectal cancer can be an inherited disease?	2 (1.3%)	16 (10.7%)	36 (24.0%)	61 (40.7%)	35 (23.3%)
Does colorectal cancer in your immediate family put you at an increased risk for developing colorectal cancer?	2 (1.3%)	8 (5.3%)	27 (18.0%)	75 (50%)	38 (25.3%)
Do you think colorectal cancer is a malignant neoplastic disease?	1 (0.7%)	12 (8.0%)	33 (22.0%)	57 (38.0%)	47 (31.3%)
Do you agree with the statement that colorectal cancer is a disease with no possibility to be completely cured?	21 (14.0%)	53 (35.3%)	49 (32.7%)	20 (13.3%)	7 (4.7%)
Can colorectal cancer be treated surgically?	0 (0.0%)	3 (2.0%)	25 (16.7%)	73 (48.7%)	49 (32.7%)
Can colorectal cancer be completely cured?	2 (1.3%)	18 (12.0%)	48 (32.0%)	64 (42.7%)	18 (12.0%)
Do you agree with the statement that colorectal cancer can be completely cured in any case?	36 (24.0%)	50 (33.3%)	40 (26.7%)	19 (12.7%)	5 (3.3%)
Is fecal occult blood test helpful in detecting colorectal cancer?	0 (0%)	5 (3.3%)	24 (16.0%)	83 (55.3%)	38 (25.3%)
Do you think inflammatory bowel diseases can be linked to the development of colorectal cancer?	0 (0%)	7 (4.7%)	57 (38%)	71 (47.3%)	15 (10.0%)
In case of having colorectal cancer, would you agree to undergo colostomy to have permanent intestinal stoma if that would be required?	3 (2.0%)	7 (4.7%)	47 (31.3%)	66 (44.0%)	27 (18.0%)
Do you think that the type of diet can affect the development of colorectal cancer?	0 (0%)	11 (7.3%)	26 (17.3%)	66 (44.0%)	47 (31.3%)
Do you think that taking regular small doses of aspirin may protect against colorectal cancer?	17 (11.3%)	30 (20.0%)	94 (62.7%)	7 (4.7%)	2 (1.3%)
	YES	NO			
Have you ever had any tests for colorectal cancer?	20 (13.4%)	129 (86.6%)			
Have you ever looked for information about colorectal cancer?	67 (44.7%)	83 (55.3%)			
Do you know what a screening is?	97 (64.7%)	53 (35.3%)			
Do you know what an intestinal stoma (fecal fistula) is?	112 (74.7%)	38 (25.3%)			
Do you pay attention to the appearance of stool, bearing in mind that a change in the appearance of stool or finding e.g. blood in it may be one of colorectal cancer symptoms?	119 (79.3%)	31 (20.7%)			
TAB. II. – SECTION 2.: KNOWLEDGE AND VIEWS OF RESPONDENTS ON COLONOSCOPY					
	YES	NO			
Do you know what colonoscopy is?	146 (97.3%)	4 (2.7%)			
	YES, UNDER GENERAL ANESTHESIA	YES, WITHOUT ANESTHESIA	NO		
Have you ever had a colonoscopy?	10 (6.7%)	12 (8.0%)	128 (85.3%)		
	YES (UNDER ANESTHESIA)	YES (DOES NOT MATTER WHETHER THE TEST WOULD BE PERFORMED UNDER ANESTHESIA OR WITHOUT IT)	YES (WITHOUT ANESTHESIA)	NO	
Would you undergo colonoscopy if your doctor told you it is necessary to have this examination?	83 (55.3%)	47 (31.3%)	18 (12.0%)	2 (1.3%)	
Would you undergo a second colonoscopy if your doctor told you to repeat this examination?	82 (54.7%)	50 (33.3%)	13 (8.7%)	5 (3.3%)	
	DEFINITELY NOT	RATHER NOT	NEITHER POSITIVE NOR NEGATIVE	RATHER YES	DEFINITELY YES
Do you think that colonoscopy is helpful in detecting and treating colorectal cancer?	2 (1.3%)	0 (0%)	11 (7.3%)	61 (40.7%)	76 (50.7%)
Do you think that colonoscopy is an examination that can protect against colorectal cancer?	8 (5.3%)	26 (17.3%)	13 (8.7%)	67 (44.7%)	36 (24.0%)
Do you think colonoscopy is a painful examination?	4 (2.7%)	29 (19.3%)	28 (18.7%)	67 (44.7%)	22 (14.7%)
Do you think colonoscopy is a shameful, embarrassing examination?	11 (7.3%)	23 (15.3%)	8 (5.3%)	59 (39.3%)	49 (32.7%)
Do you think that colonoscopy requires anesthesia for the patient?	6 (4.0%)	36 (24.0%)	21 (14.0%)	50 (33.3%)	37 (24.7%)

Do you think that colonoscopy is a safe examination?	2 (1.3%)	8 (5.3%)	30 (20.0%)	100 (66.7%)	10 (6.7%)
	<b>YES (DIET AND LAXATIVE)</b>	<b>I DO NOT KNOW</b>	<b>NO</b>		
Do you think the patient has to prepare for colonoscopy in a special way?	121 (80.7%)	28 (18.7%)	1 (0.7%)		

A vast majority of the examined individuals saw the role and value of colonoscopy in the early detection and treatment of colorectal cancer. The quality of the performed colonoscopy is not insignificant for correct diagnosis. It depends directly on the quality of intestine preparation for the examination. MacLean [11] et al. pointed out the degree of complication of information materials concerning preparation for the examination. It turned out that most of the materials discussed in the study were not sufficiently understood by patients. When promoting knowledge about neoplastic diseases, it should not be forgotten that educational materials must be accessible primarily to people with no professional medical knowledge.

Becker et al. have shown an interesting relationship, i.e. in people who realize the risk of CRC, searching for and reading educational materials on the Internet helps to reduce the level of fear, stress and also translates into a stronger motivation to undergo colonoscopy. This observation is all the more valuable if we realize that colonoscopy is considered to be an unpleasant procedure, to say the least.

The concerns related to the examination itself remain an actual problem, with colonoscopy considered to be painful by slightly more than half of those surveyed (59.4% of respondents). Moreover, 72% of respondents considered colonoscopy to be an embarrassing and shameful procedure. Such a perception of colonoscopy may be the cause of still frequently occurring late or very late CRC detection [5]. As many as  $\frac{3}{4}$  of the subjects assessed the pain/discomfort associated with colonoscopy (on a scale of 0–10 points) as 5 points or more. It should be stressed that 40% of respondents indicate the need for routine colonoscopy under general anesthesia, and 55.3% of respondents would undergo colonoscopy exclusively under anesthesia. For each clinician it is clear that an examination in different patients may have a different course, depending on patient-related factors, but the examination technique is also important [12]. Addressing the issue of colonoscopy-related concerns can be relatively simple, as demonstrated in a publication by Jamila R. Sly et al. They showed that in order to reduce the fear associated with this procedure, it is sufficient for the doctor to spend more time talking to and explaining the purpose and the essence of the colonoscopic examination to the patient [13]. Having considered the foregoing data, it can be concluded that providing the patients with not just a routine examination under anesthesia, but adequate earlier education on colonoscopy [14] and possibility of anesthesia when not tolerating the examination, could improve the reporting rate for colonoscopic tests.

Nearly half of the respondents were aware that CRC can develop from adenoid polyps. This is not a satisfactory result due to the scale of the problem represented by CRCs and the aging of the Polish population. However, a vast majority of respondents (75.3%) understands that CRC in the immediate family is a risk factor for this disease. Most of the respondents (81.4%) were also aware that CRC can be treated surgically, but only 54.7% of the respondents were aware that CRC can be completely cured. As a result, greater institutional emphasis should be placed on educating the public

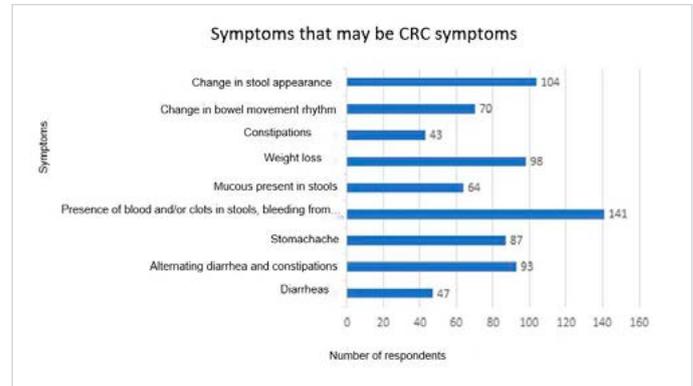


Fig. 5. Respondents' awareness of the potential CRC symptom spectrum.

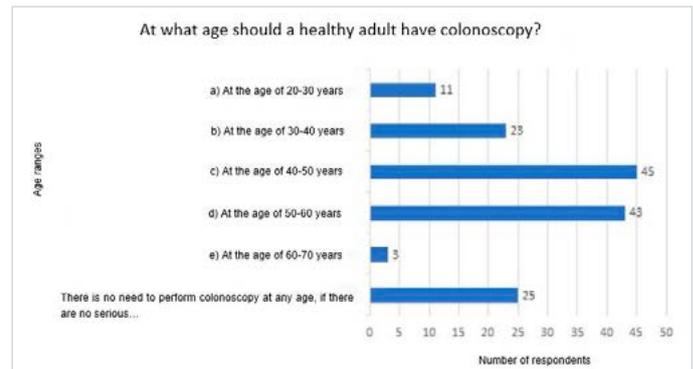


Fig. 6. At what age, according to the respondents, should colonoscopy be performed on a healthy person with no family history of a hereditary disease?

on the prevention and treatment of colorectal cancer. It is worth quoting the results of Stanley's study of 2019 [15], which shows the important role that primary care should play in promoting knowledge and raising awareness of CRC, which would translate into improved patient reporting rate for colonoscopy.

Most of the respondents saw the relationship between diet and the risk of CRC. The survey also included a question about the relationship between low doses of aspirin and reduction of colorectal cancer risk. Indication of the correct answer in this question required a deeper knowledge of CRC, which is probably why most (over 94%) of respondents did not indicate such a relationship or had no opinion in this matter [16].

Almost all patients associated rectal bleeding with a possible presence of colorectal cancer (94%). This is important because the estimated risk of a tumor in the anorectal region in a patient with rectal bleeding is about 10%. Other symptoms, indicated by over 50% of the respondents, associated with colorectal cancer were: alternating diarrhea and constipation (62%), abdominal pain (58%), weight loss (65.3%), change in bowel movement rhythm (46.7%), change in stool appearance (69.3%). This indicates a relatively good orientation of the study population concerning the spectrum of symptoms that may be present in the course of CRC. More than half of the respondents also associated the presence of inflamma-

tory bowel diseases with an increased risk of CRC. The results quoted above put the surveyed population in a much better situation than the population surveyed in a study by Tin Tin Su et al. [17]. Similarly, a study by Gede et al. [18] analyzing the awareness of a large group (1150 adults between the ages of 40 and 70) of Hungarian patients with regard to CRC screening showed that the level of knowledge in the majority of the studied population is insufficient. Similar results can be expected in the Polish population, which seems to be historically and culturally similar to the Hungarian population. At this point, however, it should be stressed that the population analyzed in this study is quite homogeneous, being largely composed of young people with a high education level [19], which may result from data collection method using forms distributed through websites and social media sites. The disadvantage of this data collection method seems to be limiting the possibility of distributing the survey to elderly people, who often do not know how to use a computer, or people who may have no access to a computer or the Internet for social reasons [2]. Worse results could probably be expected in terms of a bigger and more socioeconomically diverse group [20, 21]. Dziki et al. [22] have also undertaken research on patient awareness of CRC prevention and treatment. The study cited above analyzed a smaller population than this study (50 individuals), and demonstrated that patients need more information on CRC, as lack of knowledge on this issue may be one of the factors influencing the high prevalence of this disease in the population.

When analyzing the results obtained in this paper, one may see that in the majority of questions, a significant part of the surveyed population has basic knowledge and awareness of CRC, but the surveyed group of 150 people is still a relatively small and quite homogeneous group (with a significant percentage of young people and people with higher education). The need for further actions to raise the awareness and provide society with information also remains a topical and an extremely crucial task. The study by Chen et al. [23] shows that improving the knowledge and awareness of the population concerning CRC can be

achieved with relatively cheap and simple methods such as holding short educational seminars.

Nearly  $\frac{3}{4}$  of the respondents said they knew what an intestinal stoma was, but in case of any medical indications for it, almost a third of the respondents did not have an opinion about it, and nearly 6% of the respondents would not agree to this procedure. Patients' fear of a stoma and the notions of stigma and disability, often associated with colostomy, are an important barrier due to the lack of knowledge and education. The role of patient associations and stoma societies in educating patients about both stoma and bowel disease should be stressed here. Unfortunately, education concerning stomas still does not seem to have a sufficiently wide coverage. It is worth citing the results of a study by Szpilewska et al. entitled „Akceptacja choroby a jakość życia pacjentów ze stomią” („Disease acceptance and quality of life for stoma patients”) [24]. They have proven that sex and education of patients affect the degree of disease acceptance, but do not affect the quality of life [24]. This study also showed that the higher the degree of disease acceptance, the better the quality of life [24]. This is yet another premise that clearly shows the need of promoting knowledge about CRC and its treatment among the society [25].

## CONCLUSIONS

Based on the survey results, it can be concluded that a significant proportion of the surveyed population has basic knowledge and awareness of CRC. At the same time, about half of the respondents do not consider themselves sufficiently informed about the disease.

A higher level of education can be a factor resulting in better awareness and wider knowledge of CRC. Having considered the scale of the problem posed by CRC, it is necessary to carry out more extensive activities to promote knowledge about the disease.

It would be appropriate to carry out such a study on a larger and more socioeconomically diverse population.

## REFERENCES

1. <http://onkologia.org.pl/nowotwory-zlosliwe-ogolem-2/>.
2. Wong M.C.S., Hirai H.W., Luk A.K.C. et al.: The Knowledge of Colorectal Cancer Symptoms and Risk Factors among 10,078 Screening Participants: Are High Risk Individuals More Knowledgeable? *PLoS One.*, 2013; 8(4): 1–8. DOI: 10.1371/journal.pone.0060366.
3. <http://onkologia.org.pl/nowotwory-zlosliwe-jelita-grubego-c18-21/>. Published 2018. Accessed January 4, 2017.
4. Siriwardena A.K., Chan A.K.C., Ignatowicz A.M.: Colorectal cancer with Synchronous liver-limited Metastases: the protocol of an Inception Cohort study (CoSMIC). *BMJ Open*, 2017; 1–8. DOI: 10.1136/bmjopen-2016-015018.
5. Juon H., Guo J., Kim J., Lee S.: Predictors of Colorectal Cancer Knowledge and Screening among Asian Americans aged 50–75 years old. *J Racial Ethn Health Disparities*, 2019; 5(3): 1–16. DOI: 10.1007/s40615-017-0398-1. Predictors.
6. Lucas-Wright A., Duran P., Bazargan M., Vargas C., Maxwell A.E.: Cancer-related Knowledge, Attitudes and Behaviors within the Latino Faith Community in South Los Angeles. *Ethn Dis.*, 2019; 29(2): 239–246. DOI: 10.18865/ed.29.2.239.
7. Bertels L., van der Heijden S., Hoogsteyns M. et al.: GPs' perspectives on colorectal cancer screening and their potential influence on FIT-positive patients: an exploratory qualitative study from a Dutch context. *BJGP Open.*, 2019; bjgpopen18X101631. doi:10.3399/bjgpopen18x101631.
8. Inoshima I., Inoshima N., Wilke G. et al.: Relationship of colorectal cancer awareness and knowledge with colorectal cancer screening., 2012; 17(10): 1310–1314. DOI: 10.1038/nm.2451.A.
9. Kim M.J., Oh H., Lee K.C. et al.: Effects of an Internet-based informational video on preoperative anxiety in patients with colorectal cancer. *Ann Surg Treat Res.*, 2019; 96(6): 290–295.
10. Spronk I., Elwyn G., Meijers M.C. et al.: Availability and effectiveness of decision aids for supporting shared decision making in patients with advanced colorectal and lung cancer: Results from a systematic review., 2019: 1–14. DOI: 10.1111/ecc.13079.
11. Maclean S.A., Basch C.H., Clark A., Basch C.E.: Readability of information on colonoscopy preparation on the internet. *Tabriz Univ Med Sci.*, 2018; 8(2): 167–170. DOI: 10.15171/hpp.2018.22.
12. Aljebreen A.M., Almadi M.A., Leung F.W.: Sedated vs unsedated colonoscopy: A prospective study. *World J Gastroenterol.*, 2014; 20(17): 5113–5118. DOI: 10.3748/wjg.v20.i17.5113.
13. Jamilia R. Sly, Tiffany Edwards, Rachel C. Shelton, Lina Jandorf M.: Identifying Barriers to Colonoscopy Screening for Nonadherent African American Participants in a Patient Navigation Intervention., 2013; 40(4): 449–457. DOI: 10.1177/1090198112459514. Identifying.
14. Hsueh F., Chen C., Sun C., Chou Y., Hsiao S. et al.: A Study on the Effects of a Health Education Intervention on Anxiety and Pain During Colonoscopy Procedures. *J Nurs Res*, 2016; 24(2): 181–189. DOI: 10.1097/jnr.0000000000000112.
15. Stanley R.S.L.: Colorectal Cancer Screening: Role of Family Physicians. *Tex Med.*
16. Emilsson L., Holme Ø., Bretthauer M. et al.: Alimentary Pharmacology and Therapeutics Systematic review with meta-analysis: the comparative effectiveness of aspirin vs. screening for colorectal cancer prevention, 2016: DOI: 10.1111/apt.13857.

17. Su T.T., Goh J.Y., Tan J. et al.: Level of colorectal cancer awareness: A cross sectional exploratory study among multi-ethnic rural population in Malaysia. *BMC Cancer.*, 2013; 13(1): 1. DOI: 10.1186/1471-2407-13-376.
18. Gede N., Kiss D.R., Kiss I.: Colorectal cancer and screening awareness and sources of information in the Hungarian population., 2018: 1–6.
19. Odukoya O., Fayemi M.: A Rural-Urban Comparison of Knowledge, Risk- Factors and Preventive Practices for Colorectal Cancer among Adults in Lagos State., *Apjcp*, 2019; 20: 1063–1071. DOI: 10.31557/APJCP.2019.20.4.1063.
20. Wagner C. Von, Baio G., Raine R. et al.: Inequalities in participation in an organized national colorectal cancer screening programme: results from the first 2.6 million invitations in England. *Int J Epidemiol.*, 2011; 40(3): 712–718. DOI: 10.1093/ije/dyr008.
21. Klerk C.M. De, Gupta S., Dekker E., Essink-bot M.L., Working E.: Socioeconomic and ethnic inequities within organised colorectal cancer screening programmes worldwide., 2017: 1–9. DOI: 10.1136/gutjnl-2016-313311.
22. Dżiki Ł., Puła A., Stawiski K., Mudza B., Włodarczyk M. et al.: Patients' awareness of the prevention and treatment of colorectal cancer. *Pol Przegl chir.*, 2015; 87(9): 459–463.
23. Chen J.E., Glover G.H.: Effectiveness of a Tailored Colorectal Cancer Educational Seminar in Enhancing the Awareness, Knowledge, and Behavior of Korean Americans Living in the Los Angeles Koreatown Area., 2016; 25(3): 289–313. DOI: 10.1007/s11065-015-9294-9.Functional.
24. Szpilewska K., Juzwizyn J., Bolanowska Z., Milan M., Chabowski M.: Akceptacja choroby a jakość życia pacjentów ze stomią The acceptance of the disease and the quality of life of the patients with enteric stoma., 2018; 89(6): 19–23. DOI: 10.5604/01.3001.0010.6733.
25. International T., Epidemiology C., Honein-abouhaidar G.N. et al.: Trends and inequities in colorectal cancer screening participation in Ontario., *Cancer Epidemiol.*, 2013; 37(6): 946–956. DOI: 10.1016/j.canep.2013.04.007.

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