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Original Article

Experience and Attitude of Colorectal Screening Pilot Program Participants Regarding Screening and Screening Programs in Hungary

Zsuzsanna Kívés [1], N Dóra Endrei [1], Réka Vajda [1], Orsolya Máté [2], Noémi Németh [1], Áron Vincze [3], Imre Boncz [1]

1. *Institute of Health Insurance, Faculty of Health Sciences, University of Pécs, Pécs, Hungary*
2. *Institute of Emergency Care and Pedagogy of Health Institute, Faculty of Health Sciences, University of Pécs, Pécs, Hungary*
3. *First Department of Medicine, Medical School, University of Pécs, Pécs, Hungary*

***Corresponding Author:** Email: zsuzsa.kives@etk.pte.hu

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Abstract

Background: In 2015, in Csongrád County (Hungary), a general practitioner based colorectal screening model program was implemented by the financial support of the European Union. Our aim was to evaluate the indicators of screening program and to analyze the experiences and attitude of participants of colorectal screening pilot program.

Methods: The colon cancer screening pilot programme was carried out in 2015 involving an average-risk population aged 50-69 in Csongrád county, Hungary (invited 22 130 persons). The screening method was iFOBT, the attendance rate was 51.2%. Overall, 5580 patients out of the 10374 participants completed the self-compiled questionnaire concerning socio-demographic data, current screening programs, stool sampling problems, invitation letters, information sources and future willingness of participation.

Results: The response rate was 53%. 46.7% of the respondents had not heard about colorectal screening prior to the screening program. Participants with elementary education level mostly indicated physicians as primary information sources [OR: 2.72 (CI: 1.59-4.66)] than patients higher education level. 67.5% of patients decided alone about participation on screening. Among women, decisions supported by acquaintances were specific [OR: 2.05 (1.06-3.95]. 82.6% determined the iFOB test as an entirely accepted screening method. Medical advice is an important predictor of screening participation. If respondents were to receive an invitation after two years, 91.5% would be involved in the screening.

Conclusion: The respondents were satisfied with the screening program. Awareness raising of men, lower educated patients, those living in major cities, and recommendation of the family physician may increase the participation rate in the future.

Keywords: Colorectal screening; Participation; Satisfaction; Compliance

Introduction

Colorectal cancer is one of the major public health problems in developed countries. Worldwide, based on the incidence, this is the second most common cancerous disease in female and the third

in male patients. In men, the fourth, in women, is the third leading cause of death (1). Within Europe, in Hungary the incidence of colon cancer is at the second place in case of women and fourth in men, while regarding mortality it is the first for both genders. Based on the incidence of cancers in Hungary, colon cancer is the second most common type of cancer in case of men (ASR: 80.8/100 000), and the third most common cancer type in women (ASR: 65.6/100 000) (2). In terms of mortality it is at the second place and steadily increasing (2011: 50.7/100 000). Overall, 5070 cases were registered in men and 4260 cases in women (colon, sigmoid and rectal tumors) in 2010 and 5658 cases were registered in men and 4763 cases in women in 2014 (3). 62% increase can be observed in the period of 1975-1999 (4). Colorectal cancer represents also a significant financial burden for the society and health care financing agencies (5-9).

In Hungary, a "two-step" screening strategy is applied: the first step is faecal occult blood examination with iFOB test, in case of a non-negative screening results colonoscopy is performed in order to clarify the existence of cancer (10). This strategy is consistent with the position of the relevant professional organizations (11, 12). Over the past two decades, a number of small-scale model programs have been launched to validate the appropriate screening method and to explore the cooperative skills of the population (13).

The purpose of this research was to present the results of a questionnaire survey on the evaluation of the screening program and on the attitudes towards the screening program of patients involved in the pilot program in Csongrád County in Hungary, in 2015.

Methods

Indicators of the pilot screening program

The model program for colorectal screening with general practitioners is carried out as a national pilot project in Csongrád County (Hungary) within the SROP-6.1.3-13/1-2013-0001 - Supporting the extension of pilot screening programs (cervical screening and colorectal screening by health visitors) project funded by the European Union The objective of the program was to explore specific methods to increase the availability and effectiveness of colon screening, to summarize experiences and to formulate proposals for a national extension. It is a novel element that, through an electronic central screening system, which is accessible to general practitioners, screenings can be tracked, screening process and status become transparent. General practitioners and their assistants participated in a training in seven locations, 19 times, prior to the program. The 231 participants received information on the public health purpose of colon screening, communication and screening IT system.

In 2015, the target group of Csongrád County pilot Colorectal Screening Program, was formed in the first screening round by 53 398 people, and the second round was composed of 51 276 people. In the two rounds, altogether 22 130 invitations were delivered. The attendance rate was 51.2%, and participation rate was 47.3%. Among all medical records, 13.1% was non-negative. Overall, 927 patients were referred to colonoscopy, and 90.1% were accepted. Out of 271 histological results, in situ carcinoma was detected in 10 cases and stage I tumor in 16 cases (14).

Methods of analysis

The potential range of respondents in the first round was 10 374 and 11 699 in the second round. Overall, 3410 questionnaires were added to the database in the first screening round, while 2682 pieces were entered in the second round, out of this, after cleaning for data gaps, 5580 questionnaires were processed, with a 25% response rate. In case of some questions, different case numbers are indicated due to additional data gaps.

Participants received an anonymous self-questionnaire prepared by the researchers, included 30 items. The questionnaire included the following groups of questions: socio-demographic data (gender, age, residence, marital status, educational level), issues of current screening program and its implementation, possible problems with stool

sampling, expectations of the appearance and content of the invitation letter, sources of information about screening, acceptance of a screening test, willingness to participate in the future and screening attitudes. Respondents assessed the screening information and the organization of the program on a 7-stage Likert scale. Ethical approval was not required for this study as it involves the analysis of routinely collected screening data.

Descriptive statistical analysis was performed with absolute and relative frequency, mean, standard deviation, and median values. For continuous variables, nonparametric tests (Mann-Whitney and Kruskal-Wallis test) as well as logistic regression analysis were performed giving the odds ratio (OR) and confidence interval (CI) at the 95% probability level (P <0.05). Statistical analysis was performed with SPSS 20.0 software (IBM Corp., Armonk, NY, USA).

Results

The proportion of females in all age groups was significantly higher (P <0.001). In terms of the overall sample, 4056 women and 1524 men filled in the questionnaire. According to the level of education, the proportion of skilled worker qualification is significantly higher among men, while high school graduation and lower education was specific in women (P <0.001). A significant group of women live alone, men are specifically married or live together with a partner and children (P <0.001). Significantly more woman respondents live in counties and cities (P <0.001) (Table 1).

Table 1: Sociodemographic characteristics of the sample, distribution of gender differences and the results of the significance test (n=5580)

Variable	*Attributes*	*male n (%)*	*female n (%)*	*total*	*P-value*
Age	50-54 years	270 (17.7)	877 (21.6)	1147 (20.6)	
	55-59 years	374 (24.5)	1145 (28.2)	1519 (27.2)	
	60-64 years	475 (31.2)	1100 (27.1)	1575 (28.2)	P<0.001
	65-69 years	369 (24.2)	863 (21.3)	1232 (22.1)	
	>70 years	36 (2.4)	71 (1.8)	107 (1.9)	
	Total	1524 (100)	4056 (100)	5580 (100)	
Education	elementary school	200 (13.1)	822 (20.3)	1022 (18.3)	
	vocational school	598 (39.2)	1068 (26.3)	1666 (29.9)	
	high school	445 (29.2)	1430 (35.3)	1875 (33.6)	P<0.001
	college / university	281 (18.4)	736 (18.1)	1017 (18.2)	
	Total	*1524 (100)*	*4056 (100)*	*5580 (100)*	
Marital status	live alone	207 (13.6)	860 (21.2)	1067 (19.1)	
	live with partner/married	424 (27.8)	1033 (25.5)	1457 (26.1)	
	live with partner/married and children	811 (53.2)	1726 (42.6)	2537 (45.5)	P<0.001
	other relatives	82 (5.4)	437 (10.8)	519 (9.3)	
	Total	*1524 (100)*	*4056 (100)*	*5580 (100)*	
Place	county seat	349 (22.9)	754 (18.6)	1103 (19.8)	
	city	497 (32.6)	1597 (39.4)	2094 (37.5)	
	village	687 (44.5)	1705 (42.0)	2383 (42.7)	P<0.001
	Total	*1524 (100)*	*4056 (100)*	*5580(100)*	

Evaluation of the colorectal screening program

During the evaluation of the program, patients assessed the related issues on a seven-stage Likert scale (1=does not agree at all, 7=fully agree). The written information received in advance has been considered satisfactory by 89.6% of respondents, with 6.78 average points. Eighty and four tenths percent of respondents received a full satisfactory information on colorectal screening by the general

practitioner. Significantly more male and higher educated participants assessed the given information negatively (P<0.001), against female and participants with lower education. The instructions for the use of the sampling device were considered appropriate by 93.9% of the respondents. Eighty-seven and four tenths percent of respondents were satisfied with the organization of the screening (average 6.74). Male, participants with higher education and who living in the city were significantly more dissatisfied with the organization of screening (P<0.001), than female, participants with lower education, and who living in village.

Assessment of sampling problems

The opinion on the stool sampling was also measured by a seven-stage scale (1 = no problem, 7 = uncomfortable) 84.6% of patients (4090 people from 4836), reported no problems at all, 2.4% (n=116) evaluated the sampling very unpleasant.
Taking the sample to the post office was also assessed on a seven-stage scale by respondents (1 = not at all uncomfortable; 7 = very uncomfortable). Of the patients (3882 people out of 4735) did not perceive problems, while 3.2% (152 people) considered it very uncomfortable.
Nearly half of the respondents indicated some degree of difficulty/discomfort in relation with sampling: 14.3% (800 persons) identified sampling, 24.8% (1382 persons) indicated the placement of stool into the container and 10.6% (590 persons) reported posting. Overall, 310 people (5.6%) identified more from these difficulties. Significant difference was not detected in educational level (P = 0.283), gender (P = 0.084), marital status (P = 0.898), age groups (P = 0.828) and residence (P = 0.080).

Sources of information about colorectal tumors

The most common information source about colorectal cancer was proved a physician (46.2%), television (40.0%) and newspaper (30.9%). Men are more likely to prefer television, Internet, family members and friends than women. Significant difference was not found between the information sources based on age. Patients with higher education compared to elementary school graduates have a higher chance of having television, Internet and family members as the source of information. The highest chances could be seen in higher educated: television, Internet, family member. (Table 2).

Attitudes towards colorectal screening

Half of respondents (53,3%, n=2973) of the respondents have never heard of colorectal screening before. Most respondents (68,8%, 3852 people) have never participated in colorectal screening before. Nine hundred eleven patients from the 3767 (17%) had already reported that colorectal cancer occurred among their close relatives.
The majority of patients (67.5%) decided alone to take part in screening. Among women, the role of friends/acquaintances and healthcare professionals is more likely to affect the decision, while family members had less role than in case of men. Patients living with their families were more likely to receive support from their family members (Table 3).

Table 2: Logistic regression analysis of the main information sources on screening based on socio-demographic factors (n=5580)

Variables		***TV OR (95% CI)***	***Internet OR (95% CI)***	***Family member OR (95% CI)***	***Friend, acquaintance OR (95%CI)***	***Physician***	***Health professional OR (95% CI)***
Gender	Male	Reference	Reference	Reference	Reference	Reference	Reference
	Female	1.27 (1.08-1.48)	1.24 (1.08-1.42)	1.42 (1.21-1.68)	1.36 (1.18-1.57)	0.94 (0.68-1.30)	1.15 (0.97-1.27)
Age groups	>70 years	Reference	Reference	Reference	Reference	Reference	Reference
	65-69 years	1.21 (0.71-2.05)	1.31 (0.83-2.07)	1.12 (0.65-1.90)	0.88 (0.56-1.38)	0.55 (0.22-1.34)	1.00 (0.64-1.56)
	60-64 years	1.20 (0.71-2.05)	1.31 (0.83-2.05)	1.05 (0.62-1.77)	0.90 (0.57-1.41)	0.60 (0.25-1.44)	1.00 (0.64-1.55)
	55-59 years	1.18 (0.70-2.00)	1.20 (0.77-1.89)	1.03 (0.61-1.75)	0.90 (0.57-1.41)	0.60 (0.25-1.45)	1.04 (0.67-1.62)
	50-54 years	1.28 (0.75-2.16)	1.31 (0.83-2.06)	1.21 (0.71-2.05)	0.97 (0.62-1.53)	0.61 (0.25-1.49)	0.96 (0.62-1.50)
Education	Elementary school	Reference	Reference	Reference	Reference	Reference	Reference
	Vocational school	3.46 (2.49-4.80)	1.64 (1.36-1.98)	1.45 (1.16-1.82)	1.09 (0.91-1.31)	0.58 (0.40-0.84)	0.84 (0.71-1.00)
	High school	7.43 (5.41-10.20)	1.91 (1.59-2.30)	1.59 (1.28-1.99)	1.09 (0.91-1.31)	0.50 (0.34-0.74)	0.83 (0.70-0.99)
	College / university	12.38 (8.89-17.24)	2.34 (1.90-2.90)	1.92 (1.50-2.46)	0.81 (0.65-1.01)	0.41 (0.24-0.68)	0.82 (0.67-1.00)
Marital status	Live alone	Reference	Reference	Reference	Reference	Reference	Reference
	Live with family	1.49 (1.24-1.79)	1.29 (1.11-1.51)	0.94 (0.79-1.26)	1.10 (0.94-1.29)	0.76 (0.40-0.84)	0.88 (0.76-1.02)
Place	Village	Reference	Reference	Reference	Reference	Reference	Reference
	City	1.10 (0.94-1.29)	1.02 (0.90-1.17)	1.08 (0.92-1.26)	0.83 (0.72-0.95)	1.04 (0.76-1.42)	1.00 (0.87-1.14)
	County seat	1.49 (1.24-1.79)	1.27 (0.08-1.50)	1.20 (0.99-1.46)	0.72 (0.60-0.87)	0.67 (0.41-1.10)	0.99 (0.84-1.17)

(OR: odds ratio; CI: confidence interval)

Table 3: Distribution of people supporting participation in screening according to their significance of socio-demographic variables based on odds ratios (n=5580)

Variables		*Decided alone N=3766 (67.5%) OR (95% CI)*	*Family member N=449 (8%) OR (95% CI)*	*Friend, acquaintance N=70 (1.3%) OR (95% CI)*	*Health professional N=1082 (19.4%) OR (95% CI)*
Gender	Male	Reference	Reference	Reference	Reference
	Female	0.98 (0.87-1.12)	0.68 (0.55-0.84)	2.05 (1.06-3.95)	1.30 (1.11-1.53)
Age groups	>70 years	Reference	Reference	Reference	Reference
	65-69 years	1.03 (0.86-1.15)	1.13 (0.53-2.40)	0.64 (0.14-2.86)	1.04 (0.60-1.79)
	60-64 years	0.99 (0.64-1.50)	1.19 (0.56-2.52)	0.46 (0.10-2.08)	1.21 (0.72-2.07)
	55-59 years	0.93 (0.61-1.41)	1.23 (0.58-2.59)	0.63 (0.14-2.76)	1.27 (0.74-2.18)
	50-54 years	1.00 (0.65-1.53)	1.04 (0.49-2.23)	0.88 (0.20-3.86)	1.31 (0.76-2.24)
Education	Elementary school	Reference	Reference	Reference	Reference
	Vocational school	1.18 (0.99-1.39)	0.80 (0.60-1.06)	1.07 (0.54-2.11)	0.87 (0.71-1.06)
	High school	1.02 (0.87-1.30)	0.83 (0.62-1.10)	0.66 (0.31-1.37)	1.01 (0.83-1.23)
	College / university	1.07 (0.88-1.30)	0.74 (0.53-1.05)	1.16 (0.53-2.54)	1.05 (0.84-1.33)
Marital status	Live alone	Reference	Reference	Reference	Reference
	Live with family	0.99 (0.86-1.15)	1.34 (1.02-1.76)	0.94 (0.52-1.68)	0.96 (0.81-1.14)
Place	Village	Reference	Reference	Reference	Reference
	City	1.04 (0.91-1.18)	1.09 (0.87-1.36)	1.15 (0.67-1.96)	0.91 (0.78-1.06)
	County seat	1.07 (0.90-1.26)	1.17 (0.88-1.15)	1.03 (0.50-2.14)	0.83 (0.68-1.01)

(OR: odds ratio; CI: confidence interval)

More than half of respondents, found screening tests important if there is no symptom or age indicates (2917 persons, 58.1%). Significantly more people living in cities and villages thought as above, like 55-59 and 60-64 age groups (P=0.002), skilled workers and high school graduates (P <0.001) than those living in shire-town, higher-educated and between 50-54 years. The second most common response is that it is recommended to participate on screening if any symptoms are observed (962 people, 19.2, 1%). Six hundred and five respondents (13.8%) would participate on screening if it is a medical advice, significantly more skilled workers women and 60-64 age groups (P <0.001) than men, participants with high school and under 59 years. Furthermore, 195 participants (3.9%) think themselves healthy and do not need screening.

According to future participation on screening, 91.5% of respondents (4977 people) would take part in colorectal screening if they were called again in two years. 7.4% (401 people) only in case of a complaint, 0.8% (44 people) would not participate on a screening again and 0.3% (18 people) would not go even if having a complaint. The 50-54 years old (P < 0.001), living in county seat (P <0.001) and those with high school degree (P < 0.001) would attend in a significantly higher rate if they were to be called again.

The attitude towards screening was examined in the following question, which was evaluated by the patients on a seven-stage scale -1. Disagree, 7. Fully agree. 61.5% of respondents (2846 people) have fully agreed that they are afraid of the results of the examination, only 9.4% (435 people) marked not at all (average point 5.7; SD: 1.9; median: 7). In case if a physician suggested screening, 81% of respondents (3816 people) fully agreed, while only 4.3% (204 people) not (average point: 6.4; SD: 1.4; median 7).

Discussion

The colorectal screening program took place in Csongrád County, Hungary, resulted in a participation rate of 53.4% in the first round and 41.8% in the second round, which is below the recommendation of the European Guideline (65%) (15). The proportion of women receiving and delivering the package to the laboratory was higher in both screening rounds (72.7%) as with previous pilot programs. However, it should be mentioned, that women in general have more willingness to fill questionnaires.

Stool sampling and the post-mailing did not cause a problem for the majority. The most common problem was the placement of stool into the container, the discomfort associated with it is also an issue according to previous experience (16).

67.5% of respondents decided to take part in the screening alone. In decision-making, male respondents were primarily supported by a family member, women by friends, acquaintances and specialists. The majority of patients share their decision to someone, especially those with lower educational level (17) and the most frequent support is the spouse, especially in case of men (7).

The main source of information about colorectal cancer screening is the physician (46.2%) and television (40%), similar to the research carried out on a previous Hungarian representative sample (36.2 %, 35%) (18). Women prefer health workers as sources, while those living in a village prefer layman resources.

In relation to the appearance and content of the invitation letter, the majority prefers a non-advertising, photocopied form without full information, graphics and images. Factsheets with visual elements attached to the invitation letter clearly increase understanding and knowledge about the importance of screening (19) so as participating on screenings. According to the recommendations, the respondents will be increased if the personal invitation letter is signed by the general practitioner and not by other authorities (6) which has been confirmed by further researches (20, 21). Reminders sent to non-participants also significantly improve the acceptance of CRC screening (12).

Almost half of the respondents (46.7%) have not heard about colorectal screening before, primarily male, respondents living in village, and those living alone. In previous research, people who heard about screenings were more likely to see a media advertisement previously (22) which campaigns could effectively increase participation (23). Based on a research among Hungarian adult population, 27% of respondents have not heard of CRC screening in the past, especially men, young people and lower educated (9) which was confirmed already (24).

The important predictor of the involvement in the screening is the medical advice, which is reinforced by a number of researches (25, 26). On the background of absenting, there frequent reasons are lack of consciousness, that is, not thought to be necessary, have no problems (14) or do not have abdominal pain (27). According to 58.1% of respondents, there should be a screening if there is no symptom and age indicates, but according to 19.2%, only if symptoms are detected. Most people 80% agreed that people should go to screenings when they receive an invitation, while 61.5% are afraid of screening results.

Most of the respondents were satisfied with the screening program, 82.6% determined iFOB test as a fully acceptable screening method. Organized CRC screening programs are highly cost effective (28, 29) however only with adequate participation rate, which according even screening experts is one of the most important indicators of screening programs (30). Thus, it is a positive result, that

91.5% of our respondents would be involved in the screening if they were to receive an invitation after two years. Effective health education ensures continuity of screening by increasing awareness and knowledge by individuals (31-33).
The limit of the survey is that cross-sectional surveys do not allow generalization of causation. Another limiting factor is the non-probability sampling, which raises the occurrence of self-selection bias. The respondents were involved in screening which clearly shows a positive attitude towards screening, the replies and the attitudes of those not attended may vary considerably, thus the identification of the reasons for absence may be the possible continuation of the study.

Conclusion

Increasing participation in screening is key to achieving the desired impact of the resources devoted to filtration, in which general practitioners, community nurses and local health developers have an important role in supporting the behavior and positive attitudes of the population towards screening. In order to raise people's awareness, the target group of health promotion programs and awareness-raising campaigns are male, low-skilled, people living in major cities and those not meet regularly with their physicians.

Journalism Ethics considerations

Ethical issues (Including plagiarism, informed consent, misconduct, data fabrication and/or falsification, double publication and/or submission, redundancy, etc.) have been completely observed by the authors.

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Conflict of interest

Non-declared.

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