JBACHS
Journal of Basic and Clinical Health Sciences

J Basic Clin Health Sci 2024; 8: 93-99
https://doi.org/10.30621/jbachs.1287941
RESEARCH ARTICLE

WHAT DO FAMILY PHYSICIANS THINK OF COLORECTAL CANCER SCREENING?

Servet Aker [1], Mustafa Kürşat Şahin [2]

[1] Department of Medical Education, Faculty of Medicine, Ondokuz Mayıs University, Samsun, Turkey.
[2] Department of Family Medicine, Faculty of Medicine, Ondokuz Mayıs University, Samsun, Turkey.

ORCID: S.A. 0000-0002-1395-5944; M.K.Ş. 0000-0002-3490-6009

Corresponding author: Servet Aker, **E-mail:** servetaker@gmail.com
Received: 26.04.2023; **Accepted:** 19.10.2023; **Available Online Date:** 31.01.2024

Cite this article as: Aker S, Şahin MK. What Do Family Physicians Think of Colorectal Cancer Screening? J Basic Clin Health Sci 2024; 8: 93-99.

ABSTRACT

Purpose: The purpose of this study was to evaluate family physician (FP) practice in terms of CRC screening and recommendations for increasing participation in screening programs.
Material and Methods: The population in this descriptive study, conducted between 15 June and 15 July, 2019, consisted of 325 (78.9%) FPs working in Samsun, Turkey and consenting to participate. A questionnaire prepared by the authors based on the relevant literature was applied at face-to-face interviews.
Results: The mean age of the FPs was 44.6±0.4 years, and their mean time in service was 19.7±0.54 years. The most common suggestions were “having a dedicated member of staff of cancer screenings in family health centers”, “public education”, and “reducing the numbers of patients registered with FPs”. FPs most frequently thought that “public education”, “health education on the social media and TV”, and “reminders issued to patients” might be effective in increasing CRC screening. The methods they regarded as having the least effect were “pamphlets”, “reminder leaflets”, and “informative texts in newspapers”.
Conclusions: Screening programs should be carried out in a multidisciplinary manner, including not only physicians but also other health professionals such as health educators, with a team-based approach.

Keywords: Colorectal cancer, screening, family physician, primary health care

INTRODUCTION

Cancers are a leading cause of death in all countries and one of the main obstacles to rising life expectancies. According to World Health Organization (WHO) estimates for 2019, cancer is the main or second most important cause of death before the age of 70 in 112 out of 183 countries and the third or fourth main cause in another 23 (1). Colorectal cancer (CRC) is a ubiquitous, fatal cancer (2). It is the third most frequently diagnosed cancer in both men and women in Turkey and worldwide. CRCs are the fourth most important cause of cancer-related deaths in Turkey and globally (3, 4). CRCs are a preventable form of cancer with a high likelihood of being treatable if diagnosed in the early stage. Studies have shown that CRC screening reduces both the incidence and mortality rates (5-9). For example, the incidence of CRC in the USA decreased by 32% between 2000 and 2013, and the mortality rate decreased by 34% between 2000 and 2014 among individuals aged 50 years and older in association with CRC screening (10). Many countries provide screening programs applied at varying age ranges, varying intervals, and using different tests (6, 11-13). In Turkey, all adults aged 50-70 are advised to undergo a fecal occult blood test (FOBT) every two years and a colonoscopy every 10 years for early detection of CRC. It is recommended that individuals with a history of CRC

or of adenomatous polyp in first-degree relatives should start undergoing screening at the age of 40. In addition, individuals with a history of early CRC in first-degree relatives should be screened commencing five years before the age at onset of cancer in those relatives from the age of 40 onward (14). CRC screening is performed free of charge in Turkey under the Health Ministry's 'National Colorectal Cancer Screening Program.' However, the desired levels of CRC screening (70%) have yet to be achieved. Within the scope of the colorectal screening program in the USA, an 80% CRC screening level target was imposed by 2018 (12). However, the CRC screening rate based on all test types (FIT, sigmoidoscopy, colonoscopy, FIT-DNA, and CT colonography) among adults aged 50-75 in 2020 was only 71.6% (15). CRC screening rates have failed to reach adequate levels in many countries, including Turkey. Several possible physician-, patient-, screening test-, or health system-related reasons for this have been reported (16-24).

FPs play an important role in the prevention of cancer, in screening, treatment, and post-treatment and palliative care. FPs serve as "gate-openers/gate-keeper" in the health system (25, 26). Since their recommendations increase the success rates of screening programs, they also play a key role in cancer screening. Due to their long-term relationships with patients, diagnostic errors are reduced, individuals with a low risk of cancer can avoid excessive examinations, and potential costs and damage are reduced to a minimum. One particularly powerful primary factor in the health system is cost-effectiveness. In addition, FP recommendations are a highly important source of motivation in cancer screening (17, 27-29).

The purpose of this study was to evaluate the practices of FPs in terms of CRC screening and their recommendations for improving participation in such programs. FPs' recommendations regarding increasing participation in the CRC screening program are essentially an expression of what they regard as the causes of low participation. Evaluating FPs' opinions regarding CRC screening will be useful in determining measures that can be taken to raise CRC screening rates.

MATERIALS AND METHODS

Approval for the study was granted by the Ondokuz Mayıs University clinical research ethical committee, and all administrative permissions were obtained, prior to commencement (Date: 24.03.2017, Decision no: OMU KAEK 2017/138). The population of this descriptive type study consisted of 413 FPs working in 143 family health centers in 17 districts of the Turkish province of Samsun. The province of Samsun lies in the north of Turkey and has a population of 1.37 million. The sample was not selected, with all FPs actively working in Samsun during the study period being contacted. The questionnaires were completed at face-to-face interviews. The study was conducted between 15 June and 15 July, 2019. The aim of the study was explained to the FPs prior to commencement. It was explained that participation was on a voluntary basis, and verbal consent was obtained. Three hundred twenty-five (78.9%) took part in the study. A 31-item questionnaire, prepared on the basis of the relevant literature, was employed (5, 9, 16, 17, 19-22, 24, 25, 27, 29). This was tested on 15 physicians working in a community health center before the study began. The first part (7 item) contained questions regarding FPs' sociodemographic characteristics and working conditions. In the second part (13 item), the FPs were asked to respond to statements concerning CRC screening. The third part (11 item) involved FPs' recommendations concerning how CRC screening might be increased. "What is the frequency of colorectal cancer?", "What rank does colorectal cancer rank in terms of mortality?", "What is the rate of CRC screening in the at-risk group in the city where you work (Samsun)" and "Do you have any recommendation concerning increasing CRC screening?" were asked open-ended questions. Other questions were answered yes or no.

Table 1. Family Physicians' Demographic and Working Characteristics

	Number	Percentage
Gender		
Male	211	64.9
Female	114	35.1
Marital status		
Married	288	88.6
Single/widow/divorce	37	11.4
Workplace		
Urban	144	44.3
Outlying district	146	44.9
Rural	35	10.8
	Mean±SE	**Min-Max**
Age	44.6 ± 0.4	26.0 - 63.0
Profession time	19.7 ± 0.4	1.0 - 37.0
Patients per day	59.1 ± 0.1	8.0 - 110.0

The questionnaire data were transferred onto IBM SPSS Statistics version 22.0 software. These data were analyzed as number and percentage. The chi-square test was applied in the comparison of grouped data. p values <0.05 were regarded as statistically significant.

RESULTS

Demographic and Working Characteristics of FPs: Three hundred twenty-five (78.9%) FPs took part in the study. Men represented 64.0% of the participants, 88.6% were married, the participants' mean age was 44.6±0.4 years, and their mean length of time in the profession was 19.7±0.4 years (Table 1). FPs were 14.4% of 10 years or less in time in the profession, and 15.1% were 40 years or younger. The FPs were asked how many individuals they served a day, and the amount of time they devoted to each patient. Their answers revealed a mean number of patients seen per day 59.1±0.1 (min-max: 8-110), and a median time of 5 min per patient (min-max: 5-20).

Awareness of FPs about CRC: FPs were also asked about the prevalence of CRC and its place among the most common causes of cancer. The rate of FPs who answered correctly is 67.1% and 57.2% (the correct response was 3). The participants were asked "What is the rate of CRC screening in the at-risk group in the city where you work (Samsun)" The rate of those who

Table 2. Opinions and Practices of Family Physicians Regarding CRC Screening

	Yes Percentage
Can CRC be prevented by screening programs?	76.4
Do you recommend CRC screening to your patients?	98.7
Do you order FOBT for your patients?	99.7
What do you do when the FOBT is positive?	
I repeat the test	16.1
I refer the patient to the specialist	83.9
Do you trust FOBT you use?	75.0
Do you recommend colonoscopies to patients with positive FOBT results?	93.4
Do your patients with positive FOBT results undergo colonoscopies?	85.2
Do you ask your patients to bring you their colonoscopy reports?	81.6
Do your patients send you their colonoscopy reports?	71.1
Can you perform FOBT for your patients attending FHC free of charge?	100.0
Have you received training on CRC risk factors in the last five years?	63.8
Do you have a special reminder for CRC on your computer for patients attending examinations?	87.4
If so, is there a place for this person's risk factors?	51.7*
If so, is there any information about family history in this section?	51.7*
Can you provide educational information about CRC screening to your patients?	71.7
Do you need additional staff to train your patients about CRC screening?	66.1
Do you think there is a need to increase CRC screening?	92.8

*As a proportion of physicians with CRC reminder sections on their computers (87.4%-284 individuals)

Table 3. Family Physicians' Recommendations for Increasing CRC Screening

	Number*	Percentage**
A dedicated member of staff being appointed for cancer screening	24	18.6
Public education	15	11.6
Reducing numbers of patients registered with family physicians	14	10.8
Mandatory applications/sanctions on individuals failing to comply	12	9.3
Public service announcements	9	6.9
Use of social media	6	4.6
TV broadcasts	5	3.8
Increasing the number of units where screening is performed	5	3.8
Public training	4	3.1
Frequent supervision of family physicians, and warnings or sanctions against those who fail to comply	4	3.1
Screening being performed in community health centers	4	3.1
Leaflets/visual stimuli	2	1.5
Incentivization	2	1.5
Sending letters or SMS	2	1.5
Increasing the validity of screening tests	1	0.7
Setting aside a special day for cancer screening	1	0.7
Calling patients on the phone for screening. Issuing invitations	1	0.7
Routine screening in hospitals	1	0.7
Organizing campaigns	1	0.7
Mobile screening tools	1	0.7
Sending kits to homes	1	0.7
Changing the health system	1	0.7

*More than one response was given.**AS a proportion of individuals (n=129) making recommendations for increasing CRC screening

answered correctly is 13.2% (the correct response was 14.2%). There is no statistically significant difference between physicians who answered correctly and other physicians in terms of gender, age, time in the profession and the region of work ($p<0.05$).

Opinions of FPs on CRC screening: FPs' opinions and practices concerning CRC screening are shown in Table 2. Accordingly, 76.4% of FPs thought that CRC can be prevented through screening programs. More than half of FPs recommended CRC screening, fecal occult blood test (FOBT), and colonoscopy for suitable patients and though that CRC screening rates needed to be improved. However, 25% of FPs stated that they did not trust the FOBT they employed. Analysis showed that 81.6% of FPs wished to see the colonoscopy reports, but only 71.1% stated that patients actually brought those reports to them. A history of CRC among family or friends was present among 28.1% of FPs. No significant difference was determined between FPs with or without family histories of CRC in terms of thinking that CRC can be prevented through screening programs ($p=0.556$), recommending CRC screening ($p=0.276$), having FOBTs performed ($p=0.551$), confidence in the FOBT ($p=0.591$), or recommendation of colonoscopy ($p=0.579$). No significant difference was determined in terms of FPs gender, age, time in the profession and place of work CRCs can be prevented with a screening program ($p=0.347$; $p=0.487$; $p=0.588$; $p=0.492$), the status of recommending CRC screening ($p=0.556$; $p=0.147$; $p=0.781$; $p=0.321$), the status of performing GGT ($p=0.187$; $p=0.544$; $p=0.922$; $p=0.224$), the status of trusting the FGK test ($p=0.811$; $p=0.098$; $p=0.122$; $p=0.080$), and the cases of recommending colonoscopy ($p=0.254$; $p=0.078$; $p=0.760$; $p=0.388$).

While 71.7% of FPs thought they could educate their patients about CRC screening, 66.1% reported needing additional personnel to provide that education. Finally, 87.4% of FPs reported having a special reminder section on their computers concerning CRC for patients attending their clinics.

Recommendations of FPs to increase CRC screening: The open-ended question "Do you have any recommendation concerning increasing CRC screening?" was asked, and 39.7% of FPs made at least one recommendation. The distribution of the recommendations received is shown in Table 3. The FPs most frequently recommended 'The employment of a dedicated member of staff for cancer screening in family health centers", "public education" and "reducing the numbers of patients registered with FPs". FPs' levels of support for measures that might be effective in increasing CRC screening are shown in Table 4. FPs most frequently considered that "public education", "health education on social media and TV", and "reminder messages sent to patients" would be effective. The measures they thought would have the least impact on CRC screenings were "leaflets", "reminder letters", and "newspaper notices".

Table 4. Levels of Support among Family Physicians for Methods That May Be Effective in Increasing CRC Screening

	Percentage
Public education	96.0
Health information on social media and TV	95.3
Reminder messages being sent to patients	86.0
Health worker education	85.7
Billboard advertisements	85.4
Reminder phone calls being made to patients	84.1
Posters	83.4
Reminder letters to be sent to patients	83.4
Pamphlets	79.7
Reminder leaflets	77.7
Newspaper information notices	74.1

DISCUSSION

Awareness of FPs about CRC

The great majority of FPs correctly identified the rankings of CRC among all forms of cancer in terms of prevalence and mortality in Turkey. However, they were unaware of the correct CRC screening rate in the province where they lived and worked, citing a much higher figure than the reality. All countries have their own specific CRC screening programs. The rate of participation in national CRC screening programs in different countries ranges between 2% and 80%. The CRC screening participation rate in Turkey in 2016 was 20-30% (14). The FPs in the present study citing a CRC screening participation rate approximately twice as high as the true figure may derive from their receiving inadequate feedback from health managers, or to insufficient interest in the subject. Exchanges of information between health managers and FPS needs to be raised to a higher level in order to correct this.

Opinions of FPs on CRC screening: The great majority of FPs participating in this study thinks that

CRC can be prevented by means of screening programs. No significant difference was determined between FPs with relatives diagnosed with CRC and those without in terms of attitudes toward or application of CRC screening. There was no difference in the approach of FPs to CRC screening in terms of gender, age, time in the profession and place of work. This situation shows that the barriers to CRC screenings stem from the health organization or working conditions rather than FPs.

Recommendations of FPs to increase CRC screening: Approximately 60% of FPs made no recommendation regarding increasing CRC screening. FPs are aware of the scale of the threat to health posed by CRCs, and think that screening can contribute to solving the problem. However, they made no recommendations regarding that solution. This may be due to their not 'putting their minds' to increasing CRC screening, or to a lack of confidence that CRC screening can be increased.

Those FPs who did suggest recommendations for increasing CRC screening most frequently proposed "The employment of a dedicated member of staff for cancer screening in family health centers", "public education", and "reducing the numbers of patients registered with FPs". FPs were given a number of propositions for increasing participation in screening programs and were asked to indicate how effective they thought these would be. FPs most frequently considered that "public education", "health education on social media and TV", and "reminder messages sent to patients" would be effective in increasing participation.

Significant work has been done to identify and evaluate obstacles to CRC screenings, and numerous factors have been identified (18). A systematic review concerning participation in publicly available CRC screening programs summarized barriers to screening as 'fear of cancer', 'not knowing how to conduct the test', 'mental health' and 'lack of knowledge about the test.' Factors encouraging taking part in screening included 'being supported by general practitioners' and 'knowing someone who has participated in the CRC screening program' (18). In a study from the USA, individuals cited "not wanting to handle stool" and "not wanting to keep the cards with the stool sample in the hands" as pretexts for not participating in a screening program based on the FOBT (30). In another study from the USA, non-participation in screening was reported to derive from "lack of awareness" and "inadequate health provider counseling" (31). In a study from Denmark, the most important reasons for participating in CRC screening were described as "receipt of a personal letter containing an invitation to take part in CRC screening" and "payment not being requested" (32). A study involving general practitioners described "include patient discomfort with the screening method offered, cost, and perceived low importance of screening" as the most frequent barriers to participation in CR screening (33). According to a systematic review, the following are the main obstacles to screening for CRC in Turkey: As lack of knowledge about screening, lack of knowledge about cancer symptoms, low self-perception of risk, fear of the positive result, be ashamed to have screening, lack of time, financial impossibility, do not having a family history of cancer, painful and aching procedure, problem of accessing the screening, not having any complaints, not trusting the screening and do not recommend screening tests by healthcare professionals (34).

It may not be possible to target and change all the obstacles to participation in CRC screening. However, increasing public awareness and knowledge has been described as capable of ensuring higher participation (18). It has also been reported that logistical problems can be eliminated by providing technical guidance and materials together with logistical support from screening centers or general practitioners (18). FPs' recommendations for increasing participation in CRC screening programs are essentially an expression of what they regard as the reason for low uptake. We think that the sensitivity of FPs concerning public education in Turkey is associated with their seeing a lack of public knowledge on the subject and their belief that participation can be increased through public education.

Barriers to CRC screening: The average number of patients seen by the FPs in this study was 59 per day. In Ireland, GPs in solo practice is an average consultation rate of 32 daily. GPs in group practices are an average of 29 consultations per day with (35). In the US, the largest percentage of physicians saw between 11 and 20 patients per day. Only 1.3% of physicians saw between 51 and 60 patients per day (36). In Canada, family physicians see an average of 70-125 patients per week (37). Our results suggest that FPs in Turkey is under severe workload pressure. According to one study, primary care providers were estimated to need 26.7 h/day, including 14.1 h/day for preventive care, 7.2 h/day for

chronic care, 2.2 h/day for acute care, and 3.2 h/day for documentation and inbox management (38). Educating patients about CRC and screening was reported by 71.7% of FPs in this study. However, it is impossible to conclude that FPs can provide sufficient education with such a workload. In our country, as well as in the rest of the world, excessive workload is an obstacle to the full performance of primary health care workers.FPs recommending that a dedicated member of health staff be appointed for screening may be a reflection of this. The methods that FPs regarded as having the least effect on participation in CRC screening were “pamphlets”, “reminder leaflets”, and “informative texts in newspapers”. The world is changing rapidly, newspaper consumption rates in Turkey are declining fast, and use of social media in increasing. From that perspective, FPs think that old-fashioned medical practices may not be effective.

CRC screening in Turkey is free of charge. A large number of FPs reported having sections for CRC scanning on their computers, referring appropriate patients for CRC scanning, and asking patients to bring their colonoscopy reports to them. However, CRC screening rates in the province where they work are very low. We think that this shows that the problem cannot be solved merely by FPs making suggestions to their patients, and that many social, cultural, and logistical difficulties must be overcome.

Strengths and Limitations

This is the first study on the subject to be conducted with all FPs in a province in Turkey. Approximately 80% of FPs took part. However, the fact that the study was performed in only one province may make it difficult to generalize the results. In addition, the use of a self-report questionnaire may have led to bias.

CONCLUSION

FPs were aware of the great threat to health posed by CRC and think that screening can contribute to solving the problem. However, only 39.7% of FPs made suggestions concerning how screening might be increased. FPs most frequently thin that “public education”, “health education on the social media and TV” and “reminders issued to patients” may be effective in increasing CRC screening. The methods they regarded as having the least effect on CRC screening are “pamphlets”, “reminder leaflets”, and “informative texts in newspapers”.The workload in family health centers is high. This affects participation in CRC screening programs. Cancer screenings should be carried out based on a new understanding, not only by physicians and family health personnel, but also by a multidisciplinary team, including other health professionals such as health educators, within a team approach. For this reason, family health centers should be supported both by health personnel and technically. Improving patients' understanding of the importance of CRC screening, educational interventions using mass media, and culturally adapting education to populations where education is difficult to deliver may contribute to overcoming the problem. In addition, there is a need for arrangements with the health services organization.

Acknowledgement: None.
Author contribution: S.A. study design, data collection, statistics, results interpretation, writing the manuscript
M.K.Ş. Study design, data collection, results interpretation, results interpretation, reviewing the manuscript
Conflict of interests: The authors have no conflict of interest.
Ethical approval: Approval for the study was granted by the Ondokuz Mayıs University clinical research ethical committee, and all administrative permissions were obtained, prior to commencement (Date: 24.03.2017, No: OMU KAEK 2017/138).
Funding: This study does not have a sponsor.
Peer-review: Externally peer-reviewed.

REFERENCES

1. Sung H, Ferlay J, Siegel RL, Laversanne M, Soerjomataram I, Jemal A, et al. Global Cancer Statistics 2020: GLOBOCAN Estimates of Incidence and Mortality Worldwide for 36 Cancers in 185 Countries. CA Cancer J Clin 2021;71(3):209-49.
2. Siegel RL, Miller KD, Jemal A. Cancer statistics, 2019. CA Cancer J Clin. 2019;69(1):7-34.
3. World Cancer Research Fund/American Institute for Cancer Research. Diet, nutrition, physical activity, and the prevention of cancer: A global perspective 2018. (cited 3.07.2022). Available from URL: https://www.wcrf.org/wp-content/uploads/2021/02/Summary-of-Third-Expert-Report-2018.pdf.
4. Ministry of Health of the Republic of Turkey. Turkey Cancer Statistics 2017. 2021. (cited 3.07.2022). Available from URL: https://ghdx.healthdata.org/record/turkey-health-statistics-yearbook-2017
5. Ait Ouakrim D, Pizot C, Boniol M, Malvezzi M, Boniol M, Negri E, et al. Trends in colorectal cancer mortality in Europe: retrospective analysis of the WHO mortality database. BMJ 2015;351:h4970.
6. Altobelli E, Lattanzi A, Paduano R, Varassi G, di Orio F. Colorectal cancer prevention in Europe: burden of disease and status of screening programs. Prev Med 2014;62:132-41.
7. Brenner H, Stock C, Hoffmeister M. Effect of screening sigmoidoscopy and screening colonoscopy on colorectal cancer incidence and mortality: systematic review and meta-analysis of randomised controlled trials and observational studies. BMJ 2014;348:g2467.
8. Meester RG, Doubeni CA, Zauber AG, Goede SL, Levin TR, Corley DA, et al. Public health impact of achieving 80% colorectal cancer screening rates in the United States by 2018. Cancer 2015;121(13):2281-5.

9. Zorzi M, Fedeli U, Schievano E, Bovo E, Guzzinati S, Baracco S, et al. Impact on colorectal cancer mortality of screening programmes based on the faecal immunochemical test. Gut. 2015;64(5):784-90.
10. Siegel RL, Fedewa SA, Anderson WF, Miller KD, Ma J, Rosenberg PS, et al. Colorectal Cancer Incidence Patterns in the United States, 1974-2013. J Natl Cancer Inst 2017;109(8).
11. Ebell MH, Thai TN, Royalty KJ. Cancer screening recommendations: an international comparison of high income countries. Public Health Rev 2018;39:7.
12. Smith RA, Andrews KS, Brooks D, Fedewa SA, Manassaram-Baptiste D, Saslow D, et al. Cancer screening in the United States, 2019: A review of current American Cancer Society guidelines and current issues in cancer screening. CA Cancer J Clin 2019;69(3):184-210.
13. Sabatino SA, White MC, Thompson TD, Klabunde CN, Centers for Disease C, Prevention. Cancer screening test use - United States, 2013. MMWR Morb Mortal Wkly Rep. 2015;64(17):464-8.
14. Ministry of Health of the Republic of Turkey. Turkey Cancer Control Program 2016. (cited 3.07.2022). Available from URL: https://hsgm.saglik.gov.tr/depo/birimler/kanser-db/yayinlar/Kitaplar/TURKIYE_KANSER_KONTROL_PROGRAMI_2016.pdf.
15. CDC Behavioral Risk Factor Surveillance System. Use of Colorectal Cancer Screening Tests 2020. (cited 3.07.2022). Available from URL: https://www.cdc.gov/cancer/colorectal/statistics/use-screening-tests-BRFSS.htm.
16. Brown T, Lee JY, Park J, Nelson CA, McBurnie MA, Liss DT, et al. Colorectal cancer screening at community health centers: A survey of clinicians' attitudes, practices, and perceived barriers. Prev Med Rep 2015;2:886-91.
17 Demyati E. Knowledge, Attitude, Practice, and Perceived Barriers of Colorectal Cancer Screening among Family Physicians in National Guard Health Affairs, Riyadh. Int J Family Med 2014;2014:457354.
18. Dressler J, Johnsen AT, Madsen LJ, Rasmussen M, Jorgensen LN. Factors affecting patient adherence to publicly funded colorectal cancer screening programmes: a systematic review. Public Health 2021;190:67-74.
19. Muliira JK, D'Souza MS, Ahmed SM. Contrasts in Practices and Perceived Barriers to Colorectal Cancer Screening by Nurses and Physicians Working in Primary Care Settings in Oman. J Cancer Educ 2016;31(1):15-25.
20. Omran S, Barakat H, Muliira JK, Aljadaa N. Knowledge, experiences, and barriers to colorectal cancer screening: a survey of health care providers working in primary care settings. J Cancer Educ 2015;30(1):53-61.
21. Power E, Wardle J. Change in public awareness of symptoms and perceived barriers to seeing a doctor following Be Clear on Cancer campaigns in England. Br J Cancer 2015;112 Suppl 1:S22-6.
22. Rosenwasser LA, McCall-Hosenfeld JS, Weisman CS, Hillemeier MM, Perry AN, Chuang CH. Barriers to colorectal cancer screening among women in rural central Pennsylvania: primary care physicians' perspective. Rural Remote Health 2013;13(4):2504.
23. Wang H, Roy S, Kim J, Farazi PA, Siahpush M, Su D. Barriers of colorectal cancer screening in rural USA: a systematic review. Rural Remote Health 2019;19(3):5181.
24. Wong CR, Bloomfield ER, Crookes DM, Jandorf L. Barriers and facilitators to adherence to screening colonoscopy among African-Americans: a mixed-methods analysis. J Cancer Educ 2013;28(4):722-8.
25. Brandenbarg D, Roorda C, Groenhof F, Havenga K, Berger MY, de Bock GH, et al. Increased primary health care use in the first year after colorectal cancer diagnosis. Scand J Prim Health Care 2014;32(2):55-61.
26. Arcuri R, Bulhões B, Jatobá A, Bellas HC, et al. Gatekeeper family doctors operating a decentralized referral prioritization system: Uncovering improvements in system resilience through a grounded-based approach. Safety Science 2020;121:177-190.
27. Basch CH, Basch CE, Wolf RL, Zybert P. Motivating factors associated with receipt of asymptomatic colonoscopy screening. Int J Prev Med 2015;6:20.
28. Federici A, Giorgi Rossi P, Bartolozzi F, Farchi S, Borgia P, Guasticchi G. Survey on colorectal cancer screening knowledge, attitudes, and practices of general practice physicians in Lazio, Italy. Prev Med 2005;41(1):30-5.
29. Norwati D, Harmy MY, Norhayati MN, Amry AR. Colorectal cancer screening practices of primary care providers: results of a national survey in Malaysia. Asian Pac J Cancer Prev 2014;15(6):2901-4.
30. Jones RM, Woolf SH, Cunningham TD, Johnson RE, Krist AH, Rothemich SF, et al. The relative importance of patient-reported barriers to colorectal cancer screening. Am J Prev Med 2010;38(5):499-507.
31. Wee CC, McCarthy EP, Phillips RS. Factors associated with colon cancer screening: the role of patient factors and physician counseling. Prev Med 2005;41(1):23-9.
32. Berg-Beckhoff G, Leppin A, Nielsen JB. Reasons for participation and non-participation in colorectal cancer screening. Public Health. 2022;205:83-9.
33. Zhu X, Weiser E, Jacobson DJ, Griffin JM, Limburg PJ, Finney Rutten LJ. Provider-perceived barriers to patient adherence to colorectal cancer screening. Prev Med Rep 2022;25:101681.
34. Aytepe UE, Dönmez E. Türkiye'de Kolorektal Kanser Tarama Davranışları, Etkileyen Faktörler ve Taramaya Katılmama Nedenleri: Sistematik Derleme. Halk Sağlığı Hemşireliği Dergisi 2022;4(1):56-76.
35. Collins C, Homeniuk R. How many general practice consultations occur in Ireland annually? Cross-sectional data from a survey of general practices. BMC Family Practice 2021;22(1):1-9.
36. Statista. Number of patients that physicians in the U.S. saw per day from 2012 to 2018. (cited 05.10.2023). Available from URL:https://www.statista.com/statistics/613959/us-physicans-patients-seen-per-day/
37. Statista. Median number of patients seen during a typical workweek by primary care physicians in Canada in 2019. (cited 05.10.2023). Available from URL: https://www.statista.com/statistics/1097220/median-number-of-patients-seen-weekly-by-primary-physicians-by-jurisdiction-canada/
38. Porter J, Boyd C, Skandari MR, Laiteerapong N. Revisiting the time needed to provide adult primary care. Journal Of General Internal Medicine 2023;38(1):147-155.