




# Sources and information need of patients with colorectal cancer and physician's viewpoints in the Northeast of Iran: A cross-sectional study

Khalil Kimiafar<sup>1</sup> , Mojtaba Esmaeili<sup>1,2</sup>, Soudabeh Shahid Sales<sup>2</sup>, Seyyedeh Fatemeh Mousavi Baigi<sup>1,3</sup> , Fereshte Manouchehri Monazah<sup>1</sup>, Masoumeh Sarbaz<sup>1\*</sup> 

<sup>1</sup>Department of Health Information Technology, School of Paramedical and Rehabilitation Sciences, Mashhad University of Medical Sciences, Mashhad, Iran

<sup>2</sup>Cancer Research Center, Mashhad University of Medical Sciences, Mashhad, Iran

<sup>3</sup>Student Research Committee, Mashhad University of Medical Sciences, Mashhad, Iran

## Article Info

**Article type:**  
Research

### Article History:

Received: 2023-05-19

Accepted: 2023-08-30

Published: 2023-09-25

### \* Corresponding author:

Masoumeh Sarbaz

Department of Health Information  
Technology, School of Paramedical  
and Rehabilitation Sciences,  
Mashhad University of Medical  
Sciences, Mashhad, Iran

Email: Sarbazm@mums.ac.ir

### Keywords:

Colorectal Cancer  
Information Need  
Information Seeking  
Patient  
Physician

## ABSTRACT

**Introduction:** Colorectal cancer is one of the most common gastrointestinal cancers, and it is the third and fourth most common cancer among Iranian men and women, respectively. Patients suffering from cancer have different information needs, and one of the most important and reliable sources of information for them is their physicians. Therefore, this study aimed to assess the sources and information needs of patients suffering from colorectal cancer and physicians' viewpoints regarding this issue.

**Material and Methods:** This cross-sectional questionnaire survey-based study was conducted from May to December 2017. All patients diagnosed with colorectal cancer and physicians in oncology outpatient clinics at a specialized cancer hospital and a radiotherapy oncology center in Mashhad, Iran were invited to participate in the study using the census technique. The patient questionnaire was about patients' attitudes toward the consultant's information and disease, information leaflets, the treatments and complications and information sources for the disease. The physician questionnaire was about the information the physician would give to the patients.

**Results:** The mean ages of the patients and physicians participating in this study were  $50.72 \pm 16.15$  and  $40.03 \pm 11.08$  years, respectively. Most of the cases (44.8%) wanted to know everything about their illness as much as possible, while 45.5% of the patients needed the information. The majority (85.9%) of the participants were willing to know about all possible therapies regarding their illness, while 63.3% of the physicians provided treatment options that were suitable for the patient in their view, and only 33.3% of the physicians told the patients all possible treatment options.

**Conclusion:** Information regarding the illness, diagnosis, and treatment is one of the essential needs for patients suffering from colorectal cancer. It seems that it is necessary to have a good and organized plan to provide the patients suffering from colorectal cancer with the required information and increase their health information literacy as one of their undeniable rights.

## Cite this paper as:

Kimiafar K, Esmaeili M, Shahid Sales S, Mousavi Baigi SF, Manouchehri Monazah F, Sarbaz M. Sources and information need of patients with colorectal cancer and physician's viewpoints in the Northeast of Iran: A cross-sectional study. *Front Health Inform.* 2023; 12: 158. DOI: [10.30699/fhi.v12i0.450](https://doi.org/10.30699/fhi.v12i0.450)

## INTRODUCTION

Colorectal cancer (CRC) is one of the most common types of gastrointestinal cancer. About 1.4 million new CRC cases are detected every year around the world. Approximately 0.7 million people die annually from CRC [1], which is an important problem around

the world. The results of recent studies indicate that the incidence of CRC in developing countries and Asia is significant [2]. In the past decade, in many Asian countries, such as Iran, China, and South Korea, the colorectal cancer rate has increased [2]. Among Iranians, CRC is the third and fourth most common cancer in men and women, respectively. According to

the results of a study, the number of new cases of CRC is 3641 per year in Iran, and each year, 2262 Iranians die from this disease, which includes about 6.3% of all cancer-related mortalities in Iran [3].

It is predicted that the burden of CRC would increase to 3.2 million new cases and 1.6 million deaths by 2040 [1]. The dramatic growth in the number of patients with CRC has led to an ever-increasing need for information for symptom management, decision-making, life control, and future preparation. However, information needs have not been fully explored. For example, a lack of targeted educational materials in clinical practice has been reported. Several large-scale patient surveys have identified insufficient and inaccessible patient information [4]. Therefore, it is very important and challenging for health service providers to identify the information needs of patients and provide relevant information [5-7].

In a recent population-based study, Nagler et al. [8] reported that the rate of information seeking varied by tumor type: patients with colorectal cancer consistently reported less information seeking than patients with breast or prostate cancer, and the differences were greater in these cases. Patients with early-stage disease regarding cancer information resources: a survey of 800 patients and 200 caregivers reported that a high proportion of caregivers (48%), but a low proportion of patients (4.8%) directly accessed Internet resources for cancer information. Another study followed 104 patients from the initial radiotherapy consultation to the first follow-up visit and reported that although the information needs of these patients decreased during that period, they remained high [9].

Although previous studies were limited by small sample sizes and selective population sampling, the literature suggests that the need for information about rehabilitation, relapse, health promotion, and available support services may also be high for patients during the follow-up phase of their cancer care. Whether information needs differ across cancer sites is still largely unknown, but a growing body of literature suggests that providing patient-tailored information can ensure that the right type and amount of information is received [10].

Patients' participation in the decision-making process requires an individual's awareness of the diagnosis and treatment process [6]. When patients suffering from cancer become aware of their disease, they are exposed to decision-making in complex situations for which they need some information [11]. However, based on the literature, it was shown that many patients suffering from cancer are still dissatisfied with the information they received and face many challenges in meeting their information needs [12, 13]. Providing patients with appropriate and adequate information leads to a reduction in

their anxiety and empowerment. Proper planning in this field requires awareness of the information needs and the attitude of healthcare providers in response to these needs [14]. Therefore, this study was conducted to determine the sources and information needs of patients suffering from colorectal cancer and physicians' viewpoints regarding this issue.

## MATERIAL AND METHODS

### Study design

This cross-sectional study, was conducted from May to December 2017. The study population consisted of patients diagnosed with colorectal cancer and physicians working in a specialized cancer hospital and a radiotherapy oncology center in Mashhad, Iran. It was also asked to complete a similar questionnaire from a medical perspective. The subjects participated voluntarily in this study.

### Sample

All patients diagnosed with colorectal cancer (n=130) and physicians (n=35) in oncology outpatient clinics at a specialized cancer hospital and a radiotherapy oncology center in Mashhad, Iran (the only specialized cancer centers in the northeastern part of Iran) were invited to participate in the study using the census technique. In total, 130 patients and 30 physicians answered the questionnaire (response rates of 76.9% and 85.7%, respectively).

The inclusion criteria for the selection of patients were those suffering from colorectal cancer (regardless of age or educational level). Those patients who were unable to take part in the study due to fatigue caused by chemotherapy, unwillingness due to mental problems, or foreign patients were excluded. The criteria for the selection of physicians were willingness to participate and availability. Only specialists, regardless of their grade, age, or gender, were included.

### Questionnaire design

The study tool was a researcher-made questionnaire based on a literature review. Most of the questions were from a standard questionnaire previously developed [14].

The standard forward-backward approach provided by World Health Organization (WHO) was used to translate the questionnaire into Persian [15]. This includes the following steps: 1) translation into Persian and consensus on the right translation; 2) Persian to English translation; and 3) conceptual concordance between the original English version of the questionnaire and the translated English context.

The patient questionnaire had five parts, including

(a) demographic characteristics (i.e., gender, age, and occupation), (b) patients' attitudes toward the consultant's information and disease (seven questions using multiple choice scale), (c) information leaflets (one question using multiple choice scale and one question using yes/no answer), (d) the treatments and complications of the disease (three questions using multiple choice scale), (e) information sources for disease (six questions using multiple choice scale and two questions using yes/no answer), and one open-ended question. The questionnaire's validity was approved by content validity, and it was examined by six faculty members (two medical informatics specialists, two health information management specialists, and two oncologists). The reliability of the questionnaire was evaluated based on the test-retest method ( $r=0.82$ ).

The physician questionnaire had four parts, including (a) demographic characteristics (i.e., gender and age), (b) information the physician would give to the patients regarding their disease, treatment, options, side effects, and who is considered to inform the patients of their diagnosis (seven questions using a multiple choice scale), (c) the patient's use of the Internet as a source of information (three questions using a multiple choice scale), (d) training to provide the patient with information (two questions using a yes/no answer), and one open-ended question for suggestions. The validity of the questionnaires was analyzed using the content analysis method, and the reliability was evaluated using the test-retest method ( $r=0.78$ ).

### Statistical analysis

Descriptive statistics, for example frequencies, proportions, and Pearson chi-square tests, were used to test for association between categorical variables. To confirm statistical significance, the p-values of less than 0.05 were calculated statistically significant. Statistical analyses were accomplished in SPSS software (v. 16).

## RESULTS

In this study, 100 patients suffering from colorectal cancer responded to the questionnaires in the specialized cancer centers located in the east and northeast of Iran. Most of the cases were women (59%) and employees. The mean age of the patients was reported as  $50.72\pm 16.15$  years. In the present study, 17 and 13 physicians were male and female, respectively, with the mean age of  $40.03\pm 11.08$  years. Tables 1, 2 and 3 show the patients' information needs and physicians' viewpoints and the Viewpoints of patients and physicians regarding information on the Internet, respectively.

## DISCUSSION

### Patients' information needs and physicians' viewpoints

The findings of this study indicated that 45.5% of patients suffering from colorectal cancer would like to know more about their treatment options, side effects, and possible outcomes of their disease. Moreover, the most important source of the patients' information is their physician (66%), which is in line with the results of the previous studies [16, 17]. Although most of the patients wanted to know all the therapeutic options (85.9%), most of the physicians expressed only appropriate treatment options from their viewpoints.

In this regard, Lowenstein et al. also reported that, despite the desire to monitor cancer recurrence, patients had little understanding of the concept of post-treatment care and equated monitoring with screening, and they believed that if the relapse is diagnosed early, the chances of recovery will be higher. Their survey showed that physicians ( $n=38$ ) and patient advocates ( $n=11$ ) had different opinions about what patients should know about monitoring in order to be active in decision-making. For example, compared to physicians, patient advocates felt that patients should know treatment options for relapse (100% vs. 58%) and the likelihood of post-treatment relapse (100% vs. 38%) [18].

In the context of informed consent, which is one of the patients' rights, physicians must provide patients with detailed and accurate information about the possible treatment options, side effects, and possible risks [19]. The obtained results revealed that the subjects considered the information about nutrition very useful and believed that counseling in this field should be improved, which is consistent with the findings of the previous studies [20-22]. In this regard, the findings of Dau et al.'s study show that information needs about CRC treatments are largely met. However, they have found unmet information needs about the psychosocial effects of CRC. These include work and employment, mental health, sexual activity, and nutrition and diet [23].

Forty-eight percent (48.3) of the physicians informed the patients about the chance of recovery, regardless of their prognosis. One of the most challenging interactions between a physician and a newly diagnosed cancer patient is the discussion about the prediction of survival and improvement of the disease. The patients want physicians to provide them with real information about their survival. According to the literature, it was demonstrated that telling the truth may be desperate in some cases [24, 25]. The way physicians speak about reality depends on factors such as gender, educational level, economic status, culture type, and cancer type in patients. Based on the evidence, it was shown that the cultural background in different societies affects the expression of unpleasant realities to the patients.

**Table 1: Patients' information needs and physicians' views about information providers**

Subject	Patients			Physicians		
	Questions	Items	N (%)	Questions	Items	N (%)
Information provider	Who told you about your illness?	Consultant	7 (7)	Who do you think should inform the patient of the diagnosis of a serious illness?	The consultant – no-one else	11(36.7)
		One of the junior physicians	80 (80)		Anybody at registrar level or above	12(40)
		Oncology nurse	6 (6)		Anybody at SHO level or above	2(6.7)
		Another staff member who didn't introduce themselves	7 (7)		Anybody at PRHO level or above	1(3.3)
	Who would you have preferred to tell you about your illness?	Consultant	3 (3)		Specialist nursing staff	0
		One of the junior physicians	85 (85)		Nursing staff	0
		Oncology nurse	2 (2)		The patient's family	4(13.3)
		No preference	10 (10)		It doesn't matter who?	0

**Table 2: The type and amount of information needed from the point of view of physicians and patients**

Subject	Patients			Physicians		
	Questions	Items	N (%)	Questions	Items	N (%)
The type and amount of information required	How much were you told about your illness?	More than I wanted to know	14(14.1)	How much information do you think a patient should receive if they have a serious medical illness?	Everything – no matter what the diagnosis/prognosis	13(44.8)
		As much as I wanted to know	45(45.5)		Everything – if diagnosis/prognosis good	2(6.9)
		Not enough	38(38.4)		As much as the patient requests	12(41.4)
		Nothing useful at all	1(1)		Nothing – if diagnosis/prognosis poor	1(6.9)
		I cannot remember very much of the consultation	1(1)			
	Were you told about different possible treatments?	Yes	44(44.9)	When discussing treatments, would you...?	Tell the patient about all possible options (including no treatment)	10(33.3)
		No	51(52.0)		Tell the patient about the treatments you feel most appropriate	19(63.3)
		I didn't want to know about them	3 (3.1)		Not tell them about treatments at all	1(3.4)
	Were you told about the possible side effects of treatment?	Yes	49 (49)	If a patient seemed reluctant to have beneficial (possibly life-saving) treatment because of possible side effects, would you...?	Tell them all about the side effects anyway	25(83.3)
		No	49 (49)		Tell them about the side effects but play down their severity	5(16.7)
		I didn't want to know about them	2 (2)		Not tell them about the side effects at all	0
	Were you told about how the treatment (both medical and surgical) works?	Yes	61(61.2)	Would you tell the patients the chances of a cure?	Yes – no matter what the prognosis	14(48.3)
		No	35(35.7)		Yes – but only if the prognosis was good	13(44.8)
		I didn't want to know	3 (3.1)		No	2(6.9)
	Would you like to know your progress week by week?	Yes	82 (82)	Would you tell a patient about their week-to-week progress?	Yes – even if they were not doing well.	20(69)
		No	12 (12)		Yes – but only if progress was good	4(13.8)
Don't mind		6 (6)	No		5(17.2)	



**Table 3: Patients and physicians' points of view regarding information on the Internet**

Domain	Patients			Physicians		
	Questions	Items	N (%)	Questions	Items	N (%)
Use, Encouragement and trust in information on the Internet	Do you think information about illnesses from the internet is reliable?	Yes – it is all reliable	12(15.6)	What are your feelings about information from the internet?	Useful and beneficial	2(6.7)
		Most is reliable	29(37.7)		Can be useful if material carefully selected?	18(60)
		Some – if carefully selected	16(20.7)		Information on the net is generally unreliable?	6(20)
		Little is reliable	12(15.6)		It's dangerous – can adversely affect patient care	4(13.3)
		Not at all	8 (10.4)			
	Were you encouraged to look up information on the internet?	Yes	23 (25)	With regards to the internet – Do you?	Encourage patients to search for information about their illness?	7(23.4)
		No	66(71.7)		Discourage patients from searching on the internet?	10(33.3)
		I was told not to	3 (3.3)		Not mention the internet at all	13(43.3)
	Have any of your relatives looked for information about your illness on the internet?	Yes	38 (38)	When a patient brings information sourced from the internet do you?	Disregard the information	2(6.7)
		No	47 (47)		Go through the information quickly	1(3.3)
		I don't know	15 (15)		Take time to go through the information with the patient	27(90)

The western countries tend to express the reality as much as possible, while patients' families in the eastern countries try to hide the disease reality in order to support the patient [26, 27]. The right relationship between the patient and healthcare provider will have a significant effect on the improvement of the disease; therefore, it is essential to acquire the necessary communication skills [28]. One of the difficult duties of physicians is to convey bad news to the patients; consequently, some recommendations have been offered to tell the cases about bad news based on personal and clinical experiences [29]. In this regard, Lunde Huseb et al. stated that support from health professionals includes providing emotional support and treatment-related information and motivating patients for early mobilization after surgery. Health professionals should be aware of identifying the informational needs of colorectal cancer patients with respect to specific stages of treatment, which may reduce the burden of colorectal cancer treatment and empower patients to self-manage [18].

The results of the previous studies have indicated that physicians do not have the skills to inform patients of bad information, and these studies have suggested that workshops and training courses are required in this regard [30]. The physicians in the present study stated that the training regarding this issue was not enough and that they needed more skills for communication with patients, which is in line with the findings of the previous studies [14]. The results of some other studies showed that this task has been delegated to educated nurses in some developing countries, while in some developed countries, specially educated people in the field of

psycho-oncology are in charge of this critical task [20].

### Patients' information seeking on Internet and physicians' viewpoints

Most of the patients in the present study did not have access to the Internet (64%). Only 36% of patients searched for information on the Internet, while most of them used search engines such as Google. In this regard, Ofran et al. [31] evaluated Internet search patterns in their study to understand the information needs of cancer patients and their relatives, as well as to diagnose their underlying psychological states. They found that users looking for information about invasive malignancies showed shorter search durations when focusing on information about the disease and treatment. Users seeking more knowledge about disabling tumors searched for longer periods, rotated between different topics, and showed greater interest in topics such as support groups. Acquaintances searched longer than the proband when searching for information about aggressive (compared to indolent) cancers. Information needs can be modeled as transitions between five discrete states, each with a unique signature that represents the type of information the user is interested in. Thus, the early stages of information seeking for cancer follow a specific dynamic pattern. Regions of interest are disease-dependent and vary between probands and their contacts. These templates can be used by doctors and medical website authors to tailor information to the needs of patients and family members [31].

As Williams et al. reported, there is a paucity of online information available for rectal cancer patients [27].

However, Wieldraaijer and colleagues also reported that one out of three patients searched for the information they needed more on the Internet. One in four patients consults a healthcare provider, most commonly their GP, for information. Younger and more educated patients often searched for information on their own, while chemotherapy patients were more likely to consult a hospital nurse [28]. On the other hand, most of the physicians (43%) also did not encourage the patients to seek information on the Internet, while most of them (60%) said that if the content was carefully selected, the Internet could be a useful tool. Most of the physicians believed that if the patient gained information from the Internet, they would be ready to check the information with the patient. In a study carried out by Warren et al., it was indicated that if the quality of information and content were improved on the related websites, they could be used as an additional source of information for the patients [29, 30]. In addition, Internet-based platforms can address the need for follow-up for colorectal cancer patients by facilitating communication and interaction between patient and physician [32–34]. Of course, this requires obtaining the ability for information literacy and patients' health literacy [25]. The information literacy of patients suffering from cancer is associated with more knowledge of the disease, proper communication with health professionals, anxiety reduction, and increased patient satisfaction regarding healthcare [35, 36]. One of the issues in information technology used in this field is designing portals for patients [37]. The design of these portals is enhanced to empower the patient suffering from cancer toward self-care and care quality [38–42]. This will help the patients and care team acquire knowledge about health through communication, information, and decision support [43]. While analyzing the results, some limitations should be observed, such as the small sample size selected from a local area. Moreover, the stage of the cancer was not considered. Therefore, it is recommended to conduct further studies with a larger sample size and comparisons with other patient groups.

## CONCLUSION

In general, the obtained results of this study indicated that, in many cases, there was a difference between the information sources and needs of the patients

with colorectal cancer and the physicians' responses to these needs. Information about disease diagnosis and treatment is one of the essential needs of the participants. According to the principle of informed consent and the patient's rights, physicians must provide all information, such as diagnosis, treatment, and side effects, for the patient, and it is necessary to acquire proper skills in order to inform the patient about reality due to the significant effect of proper communication between the patient and healthcare provider on disease improvement. The design of cancer patient portals and production of carefully selected Internet content according to the patients' health literacy, which are endorsed by the physicians and cancer specialists, can greatly contribute to meeting the patient's information needs. Nevertheless, meeting these requirements and satisfying patients' information needs should be continuously monitored.

## ACKNOWLEDGMENT

We hereby express our gratitude to the student research committee of Mashhad University of Medical Sciences for their support in conducting this study.

## AUTHOR'S CONTRIBUTION

All authors made considerable contributions to all the conception and design of the study, analysis, and interpretation of the result, writing of the manuscript, and revising it. All authors read and approved the final version of the submitted manuscript.

## CONFLICTS OF INTEREST

The authors declare no conflicts of interest regarding the publication of this study.

## FINANCIAL DISCLOSURE

No financial interests related to the material of this manuscript have been declared.

## ETHICS APPROVAL

This study was approved by the Ethics Committee of Mashhad University of Medical Sciences (Code: 951221).

## REFERENCES

1. Vahdatimanesh Z, Zendehtdel K, Akbari Sari AA, Farhan F, Nahvijou A, Delavari A, et al. Economic burden of colorectal cancer in Iran in 2012. *Med J Islam Repub Iran*. 2017; 31: 115. PMID: 29951416 DOI: 10.14196/mjiri.31.115 [PubMed]
2. Dianatinasab M, Ghaem H, Rezaianzadeh A, Hosseini SV, Khazraei H. Colorectal cancer mortality in Shiraz, Iran. *Asian Pac J Cancer Prev*. 2016; 17(8): 4101-5. PMID: 27644668 [PubMed]
3. Arani SH, Kerachian MA. Rising rates of colorectal cancer among younger Iranians: Is diet to blame? *Curr Oncol*. 2017; 24(2): e131-7. PMID: 28490936 DOI:

- 10.3747/co.23.3226 [\[PubMed\]](#)
4. Tucker CA, Martin MP, Jones RB. Health information needs, source preferences and engagement behaviours of women with metastatic breast cancer across the care continuum: Protocol for a scoping review. *BMJ Open*. 2017; 7(2): e013619. PMID: 28213599 DOI: 10.1136/bmjopen-2016-013619 [\[PubMed\]](#)
  5. Gede N, Kiss DR, Kiss I. Colorectal cancer and screening awareness and sources of information in the Hungarian population. *BMC Fam Pract*. 2018; 19(1): 106. PMID: 29960585 DOI: 10.1186/s12875-018-0799-1 [\[PubMed\]](#)
  6. Garcia-Alonso FJ, Tejero MH, Cambrodón DB, Bermejo F. Knowledge acquired, satisfaction attained and attitudes towards shared decision making in colorectal cancer screening. *Ann Gastroenterol*. 2017; 30(1): 76-82. PMID: 28042241 DOI: 10.20524/aog.2016.0090 [\[PubMed\]](#)
  7. Lu H, Xie J, Gerido LH, Cheng Y, Chen Y, Sun L. Information needs of breast cancer patients: Theory-generating meta-synthesis. *J Med Internet Res*. 2020; 22(7): e17907. PMID: 32720899 DOI: 10.2196/17907 [\[PubMed\]](#)
  8. Nagler RH, Gray SW, Romantan A, Kelly BJ, DeMichele A, Armstrong K, et al. Differences in information seeking among breast, prostate, and colorectal cancer patients: results from a population-based survey. *Patient Educ Couns*. 2010; 81 Suppl: S54-62. PMID: 20934297 DOI: 10.1016/j.pec.2010.09.010 [\[PubMed\]](#)
  9. Douma KF, Koning CC, Zandbelt LC, de Haes HC, Smets EM. Do patients' information needs decrease over the course of radiotherapy? *Support Care Cancer*. 2012; 20(9): 2167-76. PMID: 22081119 DOI: 10.1007/s00520-011-1328-0 [\[PubMed\]](#)
  10. Shea-Budgell MA, Kostaras X, Myhill KP, Hagen NA. Information needs and sources of information for patients during cancer follow-up. *Curr Oncol*. 2014; 21(4): 165-73. PMID: 25089098 DOI: 10.3747/co.21.1932 [\[PubMed\]](#)
  11. Krist AH, Woolf SH, Hochheimer C, Sabo RT, Kashiri P, Jones RM, et al. Harnessing information technology to inform patients facing routine decisions: cancer screening as a test case. *Ann Fam Med*. 2017; 15(3): 217-24. PMID: 28483886 DOI: 10.1370/afm.2063 [\[PubMed\]](#)
  12. Hardcastle S, Maxwell-Smith C, Hagger M, O'Connor M, Platell C. Exploration of information and support needs in relation to health concerns, diet and physical activity in colorectal cancer survivors. *Eur J Cancer Care (Engl)*. 2018; 27(1): e12679. PMID: 28337818 DOI: 10.1111/ecc.12679 [\[PubMed\]](#)
  13. Choi K-C, So WK. Special issue on information need in cancer care and prevention. *Asia Pac J Oncol Nurs*. 2015; 2(3): 127-8. PMID: 27981105 DOI: 10.4103/2347-5625.163314 [\[PubMed\]](#)
  14. Wittmann E, Beaton C, Lewis W, Hopper A, Zamawi F, Jackson C, et al. Comparison of patients' needs and doctors' perceptions of information requirements related to a diagnosis of oesophageal or gastric cancer. *Eur J Cancer Care (Engl)*. 2011; 20(2): 187-95. PMID: 20345454 DOI: 10.1111/j.1365-2354.2009.01169.x [\[PubMed\]](#)
  15. World Health Organisation. Process of Translation and Adaptation of Instrument [Internet]. 2017 [cited: 15 Mar 2017]. Available from: <https://www.studypool.com/documents/9245221/who-guidelines-on-translation-and-adaptation-of-instruments>
  16. Otutaha B, Srinivasa S, Koea J. Patient information needs in upper gastrointestinal cancer: what patients and their families want to know. *ANZ J Surg*. 2019; 89(1-2): 20-4. PMID: 29893038 DOI: 10.1111/ans.14565 [\[PubMed\]](#)
  17. Hsieh L-Y, Chou F-J, Guo S-E. Information needs of patients with lung cancer from diagnosis until first treatment follow-up. *PLoS One*. 2018; 13(6): e0199515. PMID: 29928027 DOI: 10.1371/journal.pone.0199515 [\[PubMed\]](#)
  18. Husebø AM, Karlsen B, Husebø SE. Health professionals' perceptions of colorectal cancer patients' treatment burden and their supportive work to ameliorate the burden—a qualitative study. *BMC Health Serv Res*. 2020; 20(1): 661. PMID: 32680491 DOI: 10.1186/s12913-020-05520-y [\[PubMed\]](#)
  19. Rustamova F, Mammadov V, Munir K. Realization of informed consent as one of patient's rights: current situation in Azerbaijan. *Bioetika*. 2016; 1(17): 24-9. PMID: 27434222 PMID: PMC4943755 [\[PubMed\]](#)
  20. Kimiafar K, Sarbaz M, Sales SS, Esmaeili M, Ghazvini ZJ. Breast cancer patients' information needs and information-seeking behavior in a developing country. *Breast*. 2016; 28: 156-60. PMID: 27318171 DOI: 10.1016/j.breast.2016.05.011 [\[PubMed\]](#)
  21. Mousavi Baigi SF, Moradi F, Vasseifard F, Mohammad Abadi F, Mazaheri Habibi MR. The effect of nutrition training on knowledge of students at university of medical sciences. *Topics in Clinical Nutrition*. 2022; 37(3): 236-41.
  22. Ghelfi F, Tieri M, Gori S, Nicolis F, Petrella M, Filiberti A, et al. Do cancer patients change their diet in the e-health information era? A review of the literature and a survey as a proposal for the Italian population. *Food Res Int*. 2018; 104: 59-68. PMID: 29433784 DOI: 10.1016/j.foodres.2017.10.021 [\[PubMed\]](#)
  23. Dau H, Safari A, Saad El Din K, McTaggart-Cowan H, Loree JM, Gill S, et al. Assessing how health information needs of individuals with colorectal cancer are met across the care continuum: An international cross-sectional survey. *BMC Cancer*. 2020; 20(1): 1031. PMID: 33109114 DOI: 10.1186/s12885-020-07539-0 [\[PubMed\]](#)
  24. Solowski NL, Okuyemi OT, Kallogjeri D, Nicklaus J, Piccirillo JF. Patient and physician views on providing cancer patient-specific survival information. *Laryngoscope*. 2014; 124(2): 429-35. PMID: 24338452 DOI: 10.1002/lary.24007 [\[PubMed\]](#)
  25. Chen Y-Y, Li C-M, Liang J-C, Tsai C-C. Health information obtained from the internet and changes

- in medical decision making: Questionnaire development and cross-sectional survey. *J Med Internet Res.* 2018; 20(2): e47. PMID: 29434017 DOI: 10.2196/jmir.9370 [[PubMed](#)]
26. Fallowfield L, Jenkins V. Communicating sad, bad, and difficult news in medicine. *Lancet.* 2004; 363(9405): 312-9. PMID: 14751707 DOI: 10.1016/S0140-6736(03)15392-5 [[PubMed](#)]
27. Williams A, Cunningham A, Hutchings H, Harris D, Evans M, Harji D. Quality of internet information to aid patient decision making in locally advanced and recurrent rectal cancer. *Surgeon.* 2022; 20(6): e382-91. PMID: 35033455 DOI: 10.1016/j.surge.2021.12.008 [[PubMed](#)]
28. Wieldraaijer T, Duineveld L, Bemelman W, van Weert H, Wind J. Information needs and information seeking behaviour of patients during follow-up of colorectal cancer in the Netherlands. *J Cancer Surviv.* 2019; 13(4): 603-10. PMID: 31286386 DOI: 10.1007/s11764-019-00779-5 [[PubMed](#)]
29. Warren E, Footman K, Tinelli M, McKee M, Knai C. Do cancer-specific websites meet patient's information needs? *Patient Educ Couns.* 2014; 95(1): 126-36. PMID: 24447523 DOI: 10.1016/j.pec.2013.12.013 [[PubMed](#)]
30. Sajid MS, Shakir AJ, Baig MK. Information on the Internet about colorectal cancer: patient attitude and potential toward Web browsing: A prospective observational study. *Can J Surg.* 2011; 54(5): 339-43. PMID: 21933528 DOI: 10.1503/cjs.011910 [[PubMed](#)]
31. Ofra Y, Paltiel O, Pelleg D, Rowe JM, Yom-Tov E. Patterns of information-seeking for cancer on the internet: an analysis of real world data. *PLoS One.* 2012; 7(9): e45921. PMID: 23029317 DOI: 10.1371/journal.pone.0045921 [[PubMed](#)]
32. Ayyoubzadeh SM, Shirkhoda M, Rostam Niakan Kalhori S, Mohammadzadeh N, Zakerabasali S. A smartphone remote monitoring app to follow up colorectal cancer survivors: Requirement analysis. *JMIR Cancer.* 2022; 8(1): e18083. PMID: 34989685 DOI: 10.2196/18083 [[PubMed](#)]
33. de Looper M, Smets E, Schouten BC, Bolle S, Belgers EH, Eddes EH, et al. The Patient Navigator: Can a systematically developed online health information tool improve patient participation and outcomes related to the consultation in older patients newly diagnosed with colorectal cancer? *BMC Cancer.* 2022; 22(1): 109. PMID: 35078438 DOI: 10.1186/s12885-021-09096-6 [[PubMed](#)]
34. Salmani H, Nahvijou A, Sheikhtaheri A. Smartphone-based application for self-management of patients with colorectal cancer: Development and usability evaluation. *Support Care Cancer.* 2022; 30(4): 3249-58. PMID: 34984548 DOI: 10.1007/s00520-021-06754-0 [[PubMed](#)]
35. Sharma S, Oremus M. PRISMA and AMSTAR show systematic reviews on health literacy and cancer screening are of good quality. *J Clin Epidemiol.* 2018; 99: 123-31. PMID: 29654821 DOI: 10.1016/j.jclinepi.2018.03.012 [[PubMed](#)]
36. Sarbaz M, Monazah FM, Eslami S, Kimiafar K, Mousavi Baigi SF. Effect of mobile health interventions for side effects management in patients undergoing chemotherapy: A systematic review. *Health Policy and Technology.* 2022; 11(4): 100680.
37. Kooij L, Groen WG, van Harten WH. Barriers and facilitators affecting patient portal implementation from an organizational perspective: Qualitative study. *J Med Internet Res.* 2018; 20(5): e183. PMID: 29752253 DOI: 10.2196/jmir.8989 [[PubMed](#)]
38. Alpert JM, Morris BB, Thomson MD, Matin K, Brown RF. Implications of patient portal transparency in oncology: qualitative interview study on the experiences of patients, oncologists, and medical informaticists. *JMIR Cancer.* 2018; 4(1): e5. PMID: 29581090 DOI: 10.2196/cancer.8993 [[PubMed](#)]
39. Bayegi HR, Jarahi L, Mahmoudabadi M, Sarbaz M, Mousavi Baigi SF, Kimiafar K. Assess the knowledge of medical students about HTLV-1 in Mashhad university of medical science. *Frontiers in Health Informatics.* 2022; 11(1): 125.
40. Rafat Panah Bayegi H, Kimiafar K, Ahmadian B, Mousavi Baigi SF, Abbaszadeh A, Sarbaz M. Awareness of laboratory students of Mashhad university of medical sciences about human T-cell lymphotropic virus type 1 (HTLV-1). *Paramedical Sciences and Military Health.* 2022; 17(3): 40-50.
41. Sarbaz M, Sadeghian Roshanaei S, Marouzi P, Mousavi Baigi SF, Kimiafar K. A study on information sources of patients receiving organ transplantation. *Journal of Modern Medical Information Sciences.* 2022; 8(3): 246-57.
42. Sheikhtaheri A, Nahvijou A, Mashoof E. Information needs of women with breast cancer: A review of the literature. *Frontiers in Health Informatics.* 2020; 9(1): 30.
43. Gu Y, Orr M, Warren J. Health literacy and patient portals. *J Prim Health Care.* 2015; 7(2): 172-5. PMID: 26125067 [[PubMed](#)]