Makara Journal of Health Research

Volume 26
Issue 2 *August*

Article 6

8-31-2022

Determining Individuals' Attitudes Toward Cancer Screening and Their Influential Factors

Emre Erkal
Health Services Vocational School, Artvin Coruh University, Artvin 08000, Turkey, emre.erkal@artvin.edu.tr

Makara J Health Res. 2022;26(2):111–117
doi: 10.7454/msk.v26i2.1336

Makara Journal of Health Research

Determining Individuals' Attitudes Toward Cancer Screening and Their Influential Factors

Emre Erkal*

Health Services Vocational School, Artvin Coruh University, Artvin 08000, Turkey

Abstract

Background: Cancer screenings are of great importance for the early detection of cancer. The goal of this study is to determine the attitudes of individuals toward cancer screening and the factors affecting these attitudes.

Methods: This descriptive, cross-sectional study comprised 1059 participants who were living in Turkey. The participants were recruited through the snowball sampling method between December 6 and 24, 2021. The Individual Self-Assessment Form and Attitude Scale for Cancer Screening were used to collect data. The data were analyzed by using independent samples t-test, one-way ANOVA, and Pearson's correlation analysis.

Results: The mean score of the participants' attitude toward cancer screening was 94.57 ± 18.39. Age, gender, marital status, place of residence, family type, occupation, social security, income, and educational level had a significant effect on the participants' attitude score ($p < 0.05$). Furthermore, the attitude score was significantly affected by cancer screening information; early cancer screening; and the beliefs that early cancer detection is achievable and that cancer is a preventable and treatable disease ($p < 0.001$).

Conclusions: Individuals have a positive attitude toward cancer screening. Health professionals should inform individuals who have a negative attitude toward cancer screening.

Keywords: attitude, cancer screening, individual

INTRODUCTION

Cancer, which is seen as an important obstacle to the prolongation of life expectancy, is one of the main causes of death in all countries, and its incidence and death burden have gradually increased.[1] The 2020 GLOBOCAN data show that 19.29 million new cancer cases in both genders have been diagnosed and 9.96 million cancer-related deaths have been reported worldwide. Estimates indicate that cancer cases and cancer-related deaths will reach 30.2 million and 16.3 million, respectively, by 2040.[2] In Turkey, 233 thousand new cancer cases were identified, and 126 thousand deaths occurred from cancer in 2020.[3]

Disseminating established cancer prevention methods and developing a long-term infrastructure for cancer care are crucial for guaranteeing worldwide cancer control.[1] The devastating effects of cancer detected at an advanced stage have fueled the research on methods for detecting this disease before symptoms appear.[4] Cancer screening, an important component of the struggle to reduce the burden of cancer-related morbidity and mortality, is a multistage care process involving patients, providers, and healthcare organizations and is based on detecting a malignancy or precursor lesion at an early stage when the treatment of cancer prior to symptom onset is most effective.[5–7] Cancer information, awareness, and screening are vital for improving the survival rates of patients, and screening programs enable early discovery and improve the chance of survival.[8] Studies have shown that lung cancer screening with computed tomography three times a year reduces the 10-year risk of death by 39%,[9] and screening with flexible sigmoidoscopy is associated with a reduction in colorectal cancer incidence and mortality.[10] Patients with cancer who are diagnosed at an early stage have an improved disease prognosis and reduced disease burden.[11] Breast cancers detected through screening have favorable clinicopathological features, such as small tumor size and low lymph node involvement incidence.[12] Women between the ages of 50–69 diagnosed with breast cancer through screening programs have a favorable disease prognosis.[13]

In Turkey, screening programs for breast cancer, cervical cancer, and colorectal cancers are carried out by the Cancer Department within the body of the Republic of Turkey Ministry of Health; these programs start with cervical screening at the age of 30 years old and end with colorectal cancer screening at the age of 70 years old.[14] Attitude is defined as a person's global evaluations of objects or their likes and dislikes and has an effect on behaviors.[15] A study carried out in Iran discovered a positive relationship between women' breast cancer

***Corresponding author:**
Emre Erkal
Health Services Vocational School, Artvin Coruh University, Artvin, Turkey
E-mail: emre.erkal@artvin.edu.tr

screening behaviors and attitudes toward breast cancer screening.[16] Screening tests reduce the burden of cervical cancer, and women who are likely to have a screening test have a positive attitude toward cervical cancer screening.[17]

Various studies in the literature have evaluated the attitude toward screening programs for a specific cancer type.[18–22] However, evidence for evaluating the general attitude toward cancer screenings has been insufficient.[23,24] Given this knowledge, assessing individual attitudes toward cancer screening in society is believed to be critical. This cross-sectional study was carried out to determine the attitudes of individuals toward cancer screening and their influencing factors.

METHODS

This study was a descriptive, cross-sectional study. The study population consisted of individuals aged between 30 and 70 years old living in Turkey. The sample was determined by using the snowball sampling method, and data were collected between December 6–24, 2021. Snowball sampling is a nonprobability sampling method. Using this method to sample participants who are difficult to reach is advantageous in terms of time and cost but has the disadvantage of nonrandom participant sampling.[25] A total of 1116 participants participated in the survey. However, 57 participants were excluded from the analysis because they were under 30 years old. The study was completed with 1059 participants.

Participants between the ages of 30 and 70 years old who were at least literate and willing to participate in the research were included. The participants had no cognitive, visual, or orthopedic disabilities that prevented them from understanding and completing the research questions. Research data were collected with the Individual Self-Assessment Form and Attitude Scale for Cancer Screening.

The individual self-assessment form which the researcher developed with 19 questions in line with the data in the literature,[24,26] aims to determine the sociodemographic characteristics and attitudes of the participants.

The scale developed by Öztürk *et al*. aimed to question the attitude toward cancer screenings.[27] It consists of 24 attitude statements and a single subdimension, as well as a five-point Likert scale as follows: 5 = completely agree, 4 = partially agree, 3 = neither agree nor disagree, 2 = partially disagree, 1 = completely disagree. The scale contains 13 items regarding negative attitudes (items 9, 12, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, and 24) and is reverse coded when calculated. The scale is scored between 24–120. A high score reflects a positive attitude toward cancer screening. Although the scale lacks a specific cut-off point, its Cronbach's α value is 0.95. In this study, its Cronbach's α was 0.91.

Research data were collected online. In this context, a survey form was created via Google Forms, and the link was sent to the participants via Whatsapp. The participants were asked to fill in the forms and share them with the individuals around them. Repeated attempts by the participants to respond were blocked.

The data were evaluated with SPSS 23 program and were considered significant at $p < 0.05$ with a 95% confidence interval. Data were shown as percentile and mean ± SD. Skewness and kurtosis analyses were used to evaluate the normality of data distribution. Independent samples *t*-test was used to compare normally distributed binary variables with the scores of the attitude toward cancer screening, and one-way ANOVA and post-hoc tests were used for more than two normally distributed variables. The relationship between age and scores of the attitude toward cancer screening was evaluated through Pearson correlation analysis.

Ethical approval was obtained for the research from Artvin Coruh University Ethics Committee (Date: 02.12.2021 No: E-18457941-050.99-31182). The participants in this study, which was conducted in line with the Declaration of Helsinki, were informed online, and their consent was obtained. The necessary permission for the use of the cancer screening attitude scale used in this study was obtained from the relevant author.

RESULTS

The mean age of the participants was 42.63 ± 9.06 (min 30 – max 70). Of the participants, 31.8% were aged 30–37 years old, 63.7% were female, 80.1% were married, 45.3% lived in city centers, 84.4% had a nuclear family structure, 61.8% were employed and 38% of them were civil servants, 77.5% had social security, 46% had an income equal to their expenses, 37.3% were university graduates, and 25.5% had a chronic disease (Table 1).

A total of 53.4% of the participants had knowledge about cancer screening and 41.5% of those who had information sources were health professionals, 25.5% had previously undergone cancer screening, 91.5% stated that the early detection of cancer is possible, 77.2% stated that cancer is a preventable disease, and 83.2% stated that cancer is a treatable disease. In addition, 7.1% of the participants had cancer and 32.7% had a family history of cancer (Table 1).

The mean score of the participants' attitude toward cancer screening was 94.57 ± 18.39 (min: 28, max: 120). A significant relationship was found between the age of the

TABLE 1. Characteristics of the participants (N = 1059)

Participants' characteristics	Frequency	Percentage
Age		
30–37	337	31.8
38–45	372	35.1
46–53	203	19.2
54–61	109	10.3
62 and over	38	3.6
Gender		
Male	384	36.3
Female	675	63.7
Marital Status		
Married	848	80.1
Single	211	19.9
Place of residence		
City center	480	45.3
District	452	42.7
Town/village	127	12.0
Family type		
Nuclear	894	84.4
Extended	165	15.6
Employment status		
Employed	654	61.8
Unemployed	405	38.2
Profession (N = 654)		
Civil servants	248	38.0
Self-employed	150	22.9
Agriculture/livestock	71	10.8
Worker	185	28.3
Social security		
Yes	821	77.5
No	238	22.5
Income		
More than expenditures	157	14.8
Equal to expenditures	487	46.0
Less than expenditures	415	39.2
Educational level		
Literate	64	6.0
Primary	214	20.2
Secondary	120	11.3
High school	266	25.2
University	395	37.3
Presence of chronic disease		
Yes	270	25.5
No	879	74.5
Information on cancer screening		
Yes	566	53.4
No	493	46.6
Information source (N = 566)		
Newspaper, Magazine, Book	34	6.0
Internet	143	25.1
Radio and television	46	8.1
Surrounding friends, relatives, spouses and friends	110	19.3
Healthcare personnel	233	41.5
Cancer screening		
Yes	270	25.5
No	789	74.5
Early detection of cancer is possible		
Yes	969	91.5
No	66	8.5
Cancer can be prevented		
Yes	818	77.2
No	241	22.8
Cancer can be cured		
Yes	881	83.2
No	178	16.8
Presence of cancer		
Yes	75	7.1
No	984	92.9
Family history of cancer		
Yes	346	32.7
No	713	67.3

participants and the mean score of the attitude toward cancer screening ($p < 0.001$). Dunnett's C analysis showed that the participants aged 30–37 years old had a higher mean attitude score than the participants aged 54–61 years old and those aged 62 and over. A significant negative relationship was found between the mean age of the participants and the mean attitude score ($r = -0.152$; $p < 0.001$).

Female participants had a significantly higher mean score of the attitude toward cancer screening than male participants ($p < 0.001$). Single participants had a significantly higher mean score of the attitude toward cancer screening than married participants ($p < 0.05$). A significant relationship was found between the participants' residence and their mean score of attitude toward cancer screening ($p < 0.001$). Dunnett's C analysis revealed that the mean attitude score of the participants living in city centers and districts was higher than that of the participants living in towns/villages. The mean attitude score of the participants living with nuclear families was significantly higher than that of the participants living with extended families ($p < 0.01$).

A significant relationship was found between the profession of the participants and their average attitude score ($p < 0.001$). Dunnett's C analysis demonstrated that civil servant participants had a higher mean attitude score than self-employed participants and participants working in agriculture/animal husbandry. The participants with social security had a significantly higher mean score of the attitude toward cancer screening than those without social security ($p < 0.001$). A significant relationship was found between the income and the mean attitude score of the participants ($p < 0.01$). Dunnett's C analysis indicated that the participants whose income is more than and equal to their expenses had a higher mean attitude score than the participants whose income is less than their expenses.

A significant relationship was discovered between the educational level and mean attitude score of the participants ($p < 0.001$). Dunnett's C analysis showed that

the mean attitude score of the participants who were university graduates was higher than that of the participants who were literate or primary and secondary school graduates. The mean attitude score of the participants who had knowledge about cancer screening was significantly higher than that of the participants without (p < 0.001). The mean attitude score of the participants who had undergone cancer screening was significantly higher than that of the participants who had not (p < 0.001).

The mean attitude score of the participants who stated that they thought that the early detection of cancer is possible (p < 0.001), that cancer can be prevented (p < 0.001), and that cancer can be cured (p < 0.001) was significantly higher than that of the participants who did not (Table 2). No significant relationship was found between the mean attitude scores and employment status, presence of chronic disease, source of screening information, presence of cancer, and family history of cancer (p > 0.05) (Table 2).

TABLE 2. Comparison of the participants' characteristics and scores of attitudes toward cancer screening (N = 1059)

Participants' characteristics	Mean±SD	*p*
Age		
30-37	94.30±19.55	
38-45	88.31±22.13	**0.000**
46-53	84.23±21.86	
54-61	94.30±19.55	
62 and over	88.31±22.13	**0.000**
Gender		
Male	88.04±20.85	
Female	98.04±15.67	**0.000**
Marital Status		
Married	94.01±19.04	
Single	96.83±15.33	**0.024**
Place of residence		
City center	96.82±15.88	
District	96.89±17.52	
Town/village	77.83±21.46	**0.000**
Family type		
Nuclear	95.38±17.90	
Extended	90.17±20.32	**0.002**
Employment status		
Employed	94.26±19.00	
Unemployed	95.08±17.37	0.483
Profession (N = 654)		
Civil servants	98.77±15.94	
Self-employed	94.14±16.84	
Agriculture/livestock	70.28±19.56	**0.000**
Worker	97.47±17.43	
Social security		
Yes	95.76±18.31	
No	90.48±18.12	**0.000**
Income		
More than expenditures	98.13±15.42	
Equal to expenditures	95.37±18.30	
Less than expenditures	92.29±19.25	**0.001**
Educational level		
Literate	81.85±19.90	
Primary	89.00±19.99	
Secondary	89.43±19.25	
High school	94.47±17.12	**0.000**
University	99.26±15.51	
Presence of chronic disease		
Yes	92.68±21.03	
No	95.22±17.36	0.074
Information on cancer screening		
Yes	99.98±14.93	
No	88.36±19.97	**0.000**
Information source (N = 566)		
Newspaper, Magazine, Book	98.05±15.08	
Internet	99.05±14.01	
Radio and television	98.43±13.84	
Surrounding friends, relatives, spouses and friends	98.79±15.64	0.295
Healthcare personnel	101.54±15.64	
Cancer screening		
Yes	100.50±15.55	
No	95.55±18.85	**0.000**
Early detection of cancer is possible		
Yes	97.17±16.24	
No	66.58±16.86	**0.000**
Cancer can be prevented		
Yes	97.64±16.25	
No	84.17±21.24	**0.000**
Cancer can be cured		
Yes	97.74±16.15	
No	78.88±20.67	**0.000**
Presence of cancer		
Yes	92.08±19.94	
No	94.76±18.26	0.223
Family history of cancer		
Yes	95.28±18.76	
No	94.23±18.21	0.386

DISCUSSION

Individuals were found to have a positive attitude toward cancer screenings. Positive attitudes have been found in men over the age of 40 toward prostate cancer screening,[28] individuals in China toward gastric cancer screening,[26] women in South India toward cervical cancer screening,[18] individuals in the Netherlands toward colorectal cancer screening,[22] and middle-aged individuals toward general cancer screening.[24] The result obtained in the present work is consistent with that reported in the literature. The positive attitudes of individuals toward cancer screening seem promising for reducing the global cancer burden.

Individuals aged 30–37 years old had a more positive attitude toward cancer screening than individuals aged 54–61 and 62 years and older, and as the age of the individuals increased, they exhibited increasingly negative attitudes toward cancer screening. Women aged 40 and

under in southeastern Nigeria were highly willing to pay for cervical cancer screening in the future.[20] In South India, women aged 30–39 exhibited more positive attitudes toward cervical cancer screening than women in other age groups.[18] In contrast to the present work, a study that examined the attitudes of men over 40 years of age toward prostate cancer screening in Zambia found no relationship between attitude and age.[28]

Women had a more positive attitude toward cancer screening than men. Similar to this study, a previous research found that women in Saudi Arabia had a highly positive attitude toward cancer screening.[23] In the general population, negative attitudes toward cancer screening were more common in males than in females.[24] In contrast to the present work, a study conducted in Turkey found that men had a more positive attitude toward cancer screening than women.[27] Women may display a more positive attitude toward cancer screening than men because more screening programs are specific to the female gender than to the male gender.[24]

Single individuals were found to have a more positive attitude toward cancer screening than married ones. Similar to this study, one work discovered that single women of reproductive age had a more positive attitude toward cervical cancer screening than married women.[29] Being single is a predictor of positive attitudes toward cervical cancer in Southern Ethiopia.[30] In contrast to the present research, a study conducted in Saudi Arabia reported that married individuals had more positive attitudes toward cancer screening than unmarried ones.[23]

This study found that individuals living in city centers and districts exhibited more positive attitudes toward cancer screening than individuals living in towns/villages. A study conducted in Ethiopia demonstrated that urban women had more positive attitudes toward cervical cancer screening than rural women.[19] Women living in urban and semiurban areas in Southern India had more positive attitudes toward cervical cancer than women living in rural areas.[18] Individuals living in large cities are likely to have easier access to health services and therefore have easier access to, and better knowledge of, screening programs than those living in rural areas. Their positive attitude may stem from this situation.

Individuals living with nuclear families had more positive attitudes toward cancer screening than those living with extended families. A study in Uganda found that participants living with families with five or fewer members were more likely to be screened for cervical cancer than those living with families with more than five members.[31]

This work found that the attitude toward cancer screening differed in accordance with profession and that the attitudes of civil servants toward cancer screenings were more positive than those of other individuals. Individuals who had social security and whose income was more than or equal to their expenses had a more positive attitude toward cancer screening than those who did not. Similar to this study, a study in China found that civil servants were more likely to be screened for stomach cancer than individuals working in other occupations.[26] In Kenya, women with insurance were more likely to be screened for breast cancer than women without insurance.[32] Women in Southern Ethiopia with a monthly income of more than 2000 Ethiopian birr had a more positive attitude toward cervical cancer screening than women with a low monthly income.[30] Poor women were less likely to be screened for breast cancer than wealthy women.[32] A study conducted in Ethiopia found no relationship between income status and attitude toward cervical cancer screening.[19] Socioeconomic factors, such as income and health insurance, affect participation in cancer screening.[33] Most of the employed people have social security and have better income than unemployed people. People with social security are more likely to apply to health institutions than those without social security and may receive information about cancer screening. Their highly positive attitude toward cancer screening was thought to be due to this situation.

University graduates had a more positive attitude toward cancer screening than other participants. In Saudi Arabia, people with a university degree and high educational attainment had a more positive attitude toward cancer screening than those without.[23] Similarly, the probability of obtaining breast cancer screening was higher in Kenyan women with high education levels than those without.[32] A meta-analysis evaluating the effect of educational levels on compliance with breast and cervical cancer screening indicated that women with high education levels had a higher risk of complying with screening than those without.[34] People with high education levels were thought to have more positive attitudes because they have better access to information and can therefore more easily access evidence for cancer screening than those without.

Individuals who had knowledge about cancer screening (53.4%) and who had cancer screening (25.5%) had a more positive attitude toward cancer screening than those who did not. Having knowledge about cervical cancer is an important predictor of positive attitudes toward cervical cancer screening.[30] A total of 22.9% of women in Southern Ethiopia, 4.3% of women in rural Uganda, and 2.3% of women in rural Ethiopia had undergone cervical cancer screening.[19,30,31] In Riyadh, 6.5% of people aged 40 and over had undergone colon cancer screening, and in China, 15.2% of individuals had received gastric cancer screening.[26,35] In Iran, a positive relationship was found between the breast cancer screening behaviors of women and their attitudes toward breast cancer screening.[16] A meta-analysis reported that Ethiopian women who have a positive attitude toward cervical cancer screening were

more likely to be tested than women with negative attitudes.[17] Attitude has been stated to have an effect on behaviors.[15] A positive attitude toward cancer screening has a positive influence on screening behaviors.

Individuals who stated that the early diagnosis of cancer is possible (91.5%), that cancer can be prevented (77.2%), and that cancer can be treated (83.2%) had a more positive attitude toward cancer screening. In Riyadh, 3.9% of individuals thought that colon cancer is preventable and 4.8% thought that the early detection of colon cancer provides a good prognosis.[35] A study conducted on Tunisian individuals found that 86.5% of the participants thought that early diagnosis increases the chance of recovery.[37] In China, 84.7% of individuals thought that stomach cancer could be prevented, 83.8% thought that stomach cancer could be diagnosed early, and 84.8% thought that stomach cancer could be treated in the early period.[26] Individuals who have negative opinions about the treatment of lung cancer were more likely to have negative attitudes toward lung cancer screening.[21] Thoughts that cancer can be diagnosed early and is a preventable and treatable disease have positive influences on the attitude toward screening. In this context, the provision of educational programs about cancer and increasing cancer awareness in individuals in society will also have positive effects on the attitude toward screening.

The strength of this study is that it shows the attitude toward cancer screening with a large sample size (n = 1059). Nonetheless, it has several limitations. This study is limited to 1059 participants, and its results cannot be generalized to the whole Turkish population. Moreover, the snowball sampling model, which is a nonprobabilistic sampling method, was used. Therefore, the participants may not have been randomly included in the sampling because the data collection process could not be controlled.

CONCLUSIONS

Screening programs enable the early diagnosis of cancer. Hence, they constitute an important component of reducing the burden of cancer-related mortality and morbidity. Health professionals are the key point in raising social awareness. Therefore, the provision of the necessary training and consultancy services to raise the awareness of cancer screenings is recommended.

ACKOWLEDGEMENT

The author is grateful to all the individuals who participated in the study.

CONFLICT OF INTEREST

The author declares no potential conflicts of interests with respect to the authorship and/or publication of this article.

FUNDING

No financial support has been received from any person or organization for this study.

Received: March 9, 2022 | Accepted: July 26, 2022

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;71:209–49.
2. The Global Cancer Observatory. *World: Estimated number of new cases in 2020, worldwide, both sexes, all ages*. France: The Global Cancer Observatory, 2020.
3. The Global Cancer Observatory. *Turkey: Estimated number of deaths in 2020, both sexes, all ages. Estimated number of deaths in 2020, Turkey, both sexes, all ages*. France: The Global Cancer Observatory, 2020.
4. Wardle J, Robb K, Vernon S, Waller J. Screening for prevention and early diagnosis of cancer. *Am Psychol*. 2015;70:119–33.
5. Pinsky PF. Principles of cancer screening. *Surg Clin North Am*. 2015;95:953–66.
6. Loud JT, Murphy J. Cancer screening and early detection in the 21(st) century. *Semin Oncol Nurs*. 2017;33:121–8.
7. Anhang Price R, Zapka J, Edwards H, Taplin SH. Organizational factors and the cancer screening process. *J Natl Cancer Inst Monogr.* 2010;2010:38–57.
8. Sahu DP, Subba SH, Giri PP. Cancer awareness and attitude towards cancer screening in India: A narrative review. *J Family Med Prim Care*. 2020;9:2214–8.
9. Pastorino U, Silva M, Sestini S, Sabia F, Borei M, Cantarutti A, *et al*. Prolonged lung cancer screening reduced 10-year mortality in the MILD trial: New confirmation of lung cancer screening efficacy. *Ann Oncol.* 2019;30:1162–9.
10. Schoen RE, Pinsky PF, Weissfeld JL, Yokochi AL, Church T, Laiyemo AO. Colorectal-cancer incidence and mortality with screening flexible sigmoidoscopy. *N Engl J Med*. 2012;366:2345–57.
11. Issa IA, Noureddine M. Colorectal cancer screening: An updated review of the available options. *World J Gastroenterol*. 2017;23:5086–96.
12. Kobayashi N, Hikichi M, Ushimado K, Sugioka A, Kiriyama Y, Kuroda M, *et al*. Differences in subtype distribution between screen-detected and symptomatic invasive breast cancer and their impact on survival. *Clin Transl Oncol*. 2017;19:1232–40.
13. Chiarelli AM, Edwards SA, Sheppard AJ, Mirea L, Chong N, Paszat L, *et al*. Favourable prognostic factors of subsequent screen-detected breast cancers among women aged 50-69. *Eur J Cancer Prev.* 2012;21:499–506.

14. Ministry of Health of the Republic of Turkey. *Turkey Cancer Control Programme: Cancer Screening*. Ankara: Ministry of Health of the Republic of Turkey, 2016.
15. Rucker DD. Attitudes and attitude strength as precursors to object attachment. *Curr Opin Psychol*. 2021;39:38–42.
16. Irani M, Nosrati SF, Ghaffari F, Fasanghari M, Mirzaii K. Knowledge, attitude, and practice of women regarding breast cancer screening behaviors in Mashhad, Iran. *J Midwifery Reprod Health.* 2021;9:2715–24.
17. Kassie AM, Abate BB, Kassaw MW, Aragie TG, Geleta BA, Shiferaw WS. Impact of knowledge and attitude on the utilization rate of cervical cancer screening tests among Ethiopian women: A systematic review and meta-analysis. *PLoS One*. 2020;15: e0239927.
18. Narayana G, Suchitra MJ, Sunanda G, Ramaiah JD, Kumar BP, Veerabhadrappa KV. Knowledge, attitude, and practice toward cervical cancer among women attending Obstetrics and Gynecology Department: A cross-sectional, hospital-based survey in South India. *Indian J Cancer*. 2017;54:481–7.
19. Ruddies F, Gizaw M, Teka B, Thies S, Wienke A, Kaufmann AM. Cervical cancer screening in rural Ethiopia: A cross-sectional knowledge, attitude and practice study. *BMC Cancer*. 2020;20:563.
20. Egede JO, Ajah LO, Agwu UM, Ajah MI, Edegbe FO, Eze J, *et al*. Awareness and attitude of women towards cervical cancer screening in Abakaliki, South East Nigeria. *Glob J Health Sci.* 2021;13:115.
21. Smits SE, McCutchan GM, Hanson JA, Brain KE. Attitudes towards lung cancer screening in a population sample. *Health Expect*. 2018;21:1150–8.
22. Douma LN, Uiters E, Timmermans DRM. Why are the public so positive about colorectal cancer screening? *BMC Public Health*. 2018;18:1212.
23. Farooqi WA, Alayed MI, Alkhuraisi FY, Alsinan ZA, Alghadeer HA, Aldajam MA. Knowledge, attitude, and perceived barriers regarding cancer screening in Saudi Arabia. *Int J Surg Med.* 2021;7:34–44.
24. Cullati S, Charvet-Bérard AI, Perneger TV. Cancer screening in a middle-aged general population: Factors associated with practices and attitudes. *BMC Public Health*. 2009;9:118.
25. Curtis AC, Keeler C. Sampling design in nursing research. *Am J Nurs.* 2021;121:53–7.
26. Liu Q, Zeng X, Wang W, Huang RL, Huang YJ, Liu S, *et al*. Awareness of risk factors and warning symptoms and attitude towards gastric cancer screening among the general public in China: A cross-sectional study. *BMJ Open*. 2019;9:e029638.
27. Yıldırım Öztürk E, Uyar M, Şahin TK. Development of an attitude scale for cancer screening. *Turkish J Oncol*. 2020;35:394–404.
28. Gift S, Nancy K, Victor M. Assessment of knowledge, practice and attitude towards prostate cancer screening among male patients aged 40 years and above at Kitwe Teaching Hospital, Zambia. *Afr J Urol*. 2020;26:70.
29. Baral P, Pokharel J, Gachhadar R. Awareness and attitude regarding cervical cancer screening among reproductive age women. *J Nepal Health Res Counc*. 2020;18:529–34.
30. Tekle T, Wolka E, Nega B, Kumma WP, Koyira MM. Knowledge, attitude and practice towards cervical cancer screening among women and associated factors in hospitals of Wolaita Zone, Southern Ethiopia. *Cancer Manag Res*. 2020;12:993–1005.
31. Ndejjo R, Mukama T, Musabyimana A, Musoke D. Uptake of cervical cancer screening and associated factors among women in rural Uganda: A cross sectional study. *PloS One*. 2016;11:e0149696.
32. Antabe R, Kansanga M, Sano Y, Kyeremeh E, Galaa Y. Utilization of breast cancer screening in Kenya: What are the determinants? *BMC Health Serv Res*. 2020;20:228.
33. Kolahdooz F, Jang SL, Corriveau A, Gotay C, Johnston N, Sharma S. Knowledge, attitudes, and behaviours towards cancer screening in indigenous populations: A systematic review. *Lancet Oncol*. 2014;15:e504–16.
34. Damiani G, Basso D, Acampora A, Bianchi M.A, Silverstrini G, Frisicale E, *et al*. The impact of level of education on adherence to breast and cervical cancer screening: Evidence from a systematic review and meta-analysis. *Prev Med.* 2015;81:281–9.
35. Alshammari SA, Alenazi HA, Alshammari HS. Knowledge, attitude and practice towards early screening of colorectal cancer in Riyadh. *J Family Med Prim Care*. 2020;9:2273–80.