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Public Awareness of Cancer, Cancer Screening, and Early Detection in Saudi Arabia: A Scoping Review

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ABSTRACT

Public understanding of cancer includes knowledge of risk factors and warning signs, awareness of screening, and knowledge of when medical assessment is needed. These are related but different outcomes. This scoping review mapped evidence on cancer awareness, screening, and early detection among populations studied in Saudi Arabia and identified the main knowledge gaps, associated factors, information sources, and limitations of the available evidence. The review followed the Arksey and O'Malley framework, JBI guidance for scoping reviews, and PRISMA-ScR reporting principles. Eligibility was structured using the Population-Concept-Context framework. The publication period was 2019 to 2024. The original evidence matrix was reassessed, and a targeted PubMed/MEDLINE and citation search was used to identify additional eligible Saudi primary studies. International studies and secondary reviews were excluded from the primary synthesis. Twelve cross-sectional studies involving 14,543 participants were included. Two addressed cancer awareness broadly, three focused on breast cancer, three on cervical cancer, and four on colorectal cancer. Findings showed repeated gaps in detailed knowledge of warning signs, screening methods, and screening eligibility. Several studies also reported low screening participation despite recognition of the benefits of early detection. Education, age, employment, income, and healthcare-related background were associated with awareness in some studies, although patterns were not consistent. Social media and the internet were common information sources. Cancer awareness in Saudi Arabia cannot be described by a single level because studies used different populations, instruments, and definitions. The evidence supports more specific education about warning signs, screening eligibility, and referral pathways, while future research should use standardized measures and stronger sampling methods.

KEYWORDS

Cancer awareness, cancer screening, early detection, breast cancer, cervical cancer, colorectal cancer, Saudi Arabia, scoping review.

ARTICLE INFORMATION

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1. Introduction

Cancer remains a major public health concern. The International Agency for Research on Cancer estimated 20.6 million new cancer cases and 9.8 million cancer deaths worldwide in 2024. In Saudi Arabia, GLOBOCAN 2024 estimated 24,624 new cancer cases and 10,357 cancer deaths. Breast cancer was the most frequently diagnosed cancer overall, followed by colorectal and thyroid cancers (International Agency for Research on Cancer [IARC], 2026). Cancer awareness is often discussed as if it were one concept, but it includes several different forms of knowledge. A person may know that cancer can be treated more successfully when detected early yet remain uncertain about warning signs, risk factors, eligibility for screening, or where screening services are available. This distinction matters because screening and early diagnosis are not the same. Screening is directed toward people without symptoms who meet defined criteria, whereas early diagnosis concerns the timely assessment of people who already have possible symptoms (World Health Organization [WHO], 2026). Public knowledge can influence help-seeking and participation in preventive services, but awareness is only one part of the pathway. Access to services, professional recommendation, fear, perceived risk, cost, and practical barriers may also shape whether people seek screening or diagnostic assessment. For this reason, cross-sectional associations between demographic characteristics and knowledge should not be interpreted as evidence that those characteristics cause low or high awareness. Saudi studies have examined awareness of general cancer misconceptions, cancer screening, breast cancer, cervical cancer, human papillomavirus, and colorectal cancer. However, the studies vary widely in their participants and

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measurement methods. Some are nationwide online surveys, while others involve university groups, primary care attendees, or residents of a single region. These populations should not be treated as interchangeable when interpreting awareness at the national level.

1.1 Significance of the study

The cancer burden in Saudi Arabia makes public understanding of warning signs and appropriate screening important for nursing and public health practice. GLOBOCAN 2024 estimated 3,865 new breast cancer cases and 3,508 colorectal cancer cases in Saudi Arabia. These two cancers alone represent a substantial share of the national cancer burden (IARC, 2026). Nurses are often among the first health professionals to discuss symptoms, prevention, and screening with patients and families. Community and primary healthcare nurses can clarify the purpose of screening, identify misconceptions, and guide eligible people toward appropriate services. Oncology nurses can reinforce symptom awareness and correct misleading information. Nurse educators can also use evidence about public knowledge gaps to design education that is specific to the population rather than relying on broad messages about cancer. The practical value of a scoping review is therefore not simply to decide whether awareness is high or low. It is to show what has been studied, which populations have been represented, what people appear to understand or misunderstand, and where the evidence remains weak.

1.2 Research gap and contribution to knowledge

A previous systematic review examined breast cancer awareness among women in Saudi Arabia and summarized 13 studies conducted over a much longer period (AlRajhi et al., 2023). The present review has a broader focus. It maps evidence related to general cancer awareness as well as breast, cervical, and colorectal cancer, and it separates knowledge of warning signs from knowledge of screening and from actual screening behavior. This distinction is important because the original version of this review combined Saudi and international studies and included a systematic review alongside primary research. The revised review is restricted to Saudi primary studies. International evidence is not used to estimate awareness in Saudi Arabia. University and clinic-based studies are retained as subgroup evidence, but their findings are not presented as representative of the general population. The review adds to the body of knowledge by describing the range of cancer awareness research conducted in Saudi Arabia from 2019 to 2024, comparing the concepts and instruments used, and identifying recurring gaps that may be relevant to nursing education, public health communication, and future research.

1.3 Aim and research question

The aim of this scoping review was to map and summarize evidence on public awareness of cancer, cancer screening, and early detection in Saudi Arabia, with attention to the populations studied, cancer types, measurement approaches, associated factors, information sources, barriers, and research limitations.

The review question was: What evidence is available regarding public awareness of cancer, cancer screening, and early detection in Saudi Arabia, and what associated factors, knowledge gaps, and research limitations have been identified?

2. Methods

2.1 Review framework

The review was structured using the scoping review framework described by Arksey and O'Malley (2005) and updated methodological guidance from JBI (Peters et al., 2020). Reporting was aligned with the PRISMA extension for scoping reviews where the available records allowed this (Tricco et al., 2018). The process included defining the review question, establishing eligibility criteria, identifying potentially relevant evidence, selecting studies, charting data, and organizing the findings into descriptive domains.

2.2 Population-concept-context framework

The Population-Concept-Context framework was used to align the title, review question, eligibility criteria, and synthesis. The population included adults living in Saudi Arabia who were studied in community, university, or primary care settings. Selected subgroups, such as female university students and staff, were eligible because the purpose of the review was to map the available evidence rather than calculate a single national prevalence estimate. Their findings were interpreted separately and were not generalized to the wider population. The concept covered knowledge and awareness of cancer risk factors, warning signs, symptoms, screening, early detection, misconceptions, information sources, attitudes, reported screening practices, and perceived barriers. The context was restricted to Saudi Arabia.

Table 1: PCC framework

PCC element	Definition in this review	Operational criteria
Population	Adults living in Saudi Arabia	Community adults, women, university groups, and primary care attendees. Findings from selected subgroups were interpreted within their setting.
Concept	Cancer awareness, screening, and early detection	Risk factors, warning signs, symptoms, misconceptions, screening knowledge, screening behavior, information sources, and barriers.
Context	Saudi Arabia	Studies conducted in Saudi Arabia or reporting separately extractable Saudi data.

2.3 Eligibility criteria

Studies were eligible when they reported primary quantitative, qualitative, or mixed-methods research published in English from 1 January 2019 through 31 December 2024 and examined at least one cancer-awareness or screening-related outcome in Saudi Arabia. Cross-sectional surveys were eligible regardless of whether they sampled the general community or a defined non-patient subgroup. Studies were excluded when they were conducted outside Saudi Arabia without separately extractable Saudi findings, focused only on clinical treatment outcomes, were secondary reviews, editorials, or commentaries, or did not provide sufficient information about cancer awareness, screening, or early detection. The systematic review by AlRajhi et al. (2023) was used only to describe existing evidence and support citation searching. It was not included in the primary evidence matrix.

2.4 Search strategy and information sources

The original manuscript reported searches in PubMed, Scopus, CINAHL, Web of Science, and Google Scholar, but the archived database histories and source-specific retrieval counts were not available during revision. To avoid reconstructing procedures that could not be verified, the revised evidence set was checked using a targeted PubMed/MEDLINE search and backward citation searching of eligible Saudi studies and the Saudi breast cancer systematic review. The evidence and bibliographic details were last verified on 4 November 2026, while the eligibility period remained 2019 to 2024.

The core PubMed search combined cancer terms, awareness terms, and the Saudi context: (cancer OR "breast cancer" OR "cervical cancer" OR "colorectal cancer" OR "prostate cancer") AND (awareness OR knowledge OR screening OR "early detection" OR "warning signs" OR "risk factors") AND ("Saudi Arabia" OR Saudi). The search was restricted to English-language publications from 2019 to 2024. Citation searching was used to locate additional Saudi primary studies that met the same criteria. Because the original database exports were not retained, database-specific retrieval counts from the first version of the review could not be reconstructed and are acknowledged as a methodological limitation.

2.5 Study selection

The 13 publications in the original evidence matrix were first reassessed. Eight studies were conducted outside Saudi Arabia and were removed from the Saudi-specific synthesis. The systematic review by AlRajhi et al. (2023) was also removed from the primary study matrix because it represented secondary evidence. Four Saudi primary studies remained from the original matrix. Targeted searching identified eight additional Saudi primary studies that met the revised criteria, giving a final evidence set of 12 studies. Screening decisions were based on study setting, publication type, population, and relevance to cancer awareness, screening, or early detection.

Selection step	Number
Studies in original evidence matrix	13
Non-Saudi studies removed	8
Secondary systematic review removed	1
Saudi primary studies retained from original matrix	4
Additional eligible Saudi primary studies identified	8
Final included studies	12

2.6 Data charting

For each study, data were charted on the author and year, setting, study population, sample size, design and sampling approach, study objective, cancer type, awareness domain, measurement instrument, and principal quantitative findings. Study details were

checked against the original publications whenever accessible. Particular attention was paid to sample size, geographical setting, study design, and whether findings represented a community sample or a selected subgroup.

2.7 Critical appraisal

A numerical quality score was not used to exclude studies in the revised scoping review. The previously reported Hawker scoring system was removed because the 45-point method and exclusion threshold could not be verified against completed study-level appraisal records. Consistent with the mapping purpose of a scoping review, eligible studies were retained and methodological limitations were considered narratively during interpretation. This approach avoids presenting unsupported quality scores while still recognizing issues such as convenience sampling, online recruitment, self-reported outcomes, and non-standardized measures.

2.8 Data synthesis

The findings were organized into four domains that reflected the review question and reduced overlap between the themes in the original manuscript: (1) awareness of cancer risk factors, warning signs, and symptoms, (2) knowledge of screening and early-detection practices, (3) sociodemographic and healthcare-related factors associated with awareness, and (4) sources of cancer information, misconceptions, and barriers to screening. A study could contribute to more than one domain. No pooled awareness estimate was calculated because the populations, cancer types, instruments, and scoring systems were heterogeneous.

3. Results

3.1 Characteristics of included studies

Twelve Saudi primary studies published from 2020 through 2023 met the revised eligibility criteria. Together they included 14,543 participants. Two studies examined cancer awareness or screening broadly, three focused on breast cancer, three on cervical cancer, and four on colorectal cancer. All used cross-sectional designs. Six were broad community or regional public surveys, three focused on women in national or regional community samples, one recruited sexually active women attending primary care, and two involved female university students or staff. These population differences were retained in the synthesis rather than treated as equivalent samples of the Saudi public. The largest study included 3,509 participants and examined common cancer misconceptions nationally (Marouf et al., 2023). The largest breast cancer study included 2,544 Saudi women from all regions (Qedair et al., 2022). Cervical cancer studies ranged from 564 to 1,489 participants, while colorectal cancer studies ranged from 385 to 1,912 participants. The diversity of settings and measures made direct numerical comparison difficult.

Table 3. Characteristics and Measurements of the Included Studies

Study	Setting / population	n	Design / sampling	Cancer focus	Measurement instrument	Main measurement domains
Marouf et al. (2023)	Nationwide Saudi adults / social-media users	3,509	Cross-sectional online; self-selected social-media sample	General cancer	Four-part questionnaire including seven misconception items; Cronbach's alpha = .722	Cancer misconceptions, information sources, demographics
Elmaghraby et al. (2023)	Saudi community adults	1,313	Descriptive cross-sectional electronic survey	General cancer screening	Structured electronic questionnaire reviewed by oncology experts and clarity-tested	Screening awareness, knowledge, attitudes, practices, information sources
Almeshari et al. (2023)	Female staff and students, University of Hail	425	Cross-sectional online survey	Breast cancer	37-item Arabic/English closed-ended questionnaire	Risk factors, signs and symptoms, breast self-examination, screening, attitudes and practices

Study	Setting / population	n	Design / sampling	Cancer focus	Measurement instrument	Main measurement domains
Qedair et al. (2022)	Saudi women from all regions	2,544	Nationwide web-based cross-sectional study; convenience sampling	Breast cancer	Arabic-translated Breast Cancer Awareness Measure	Warning signs, risk factors, screening, breast self-examination
Alsareii et al. (2020)	Female students and faculty, College of Medicine, Najran University	300	Cross-sectional online survey	Breast cancer	Author-developed questionnaire based on previous literature	General knowledge, warning signs, risk factors, information sources
Algabr et al. (2022)	Sexually active Saudi women attending primary care, Riyadh	601	Cross-sectional self-administered survey	Cervical cancer	Questionnaire adapted from a previously validated cervical cancer instrument	Cervical cancer knowledge, Pap screening, attitudes and practices
Akkour et al. (2021)	Saudi women from multiple regions	564	Cross-sectional online social-media survey	Cervical cancer / HPV	Self-administered questionnaire	Cervical cancer, HPV, HPV vaccination, screening
Zahid et al. (2022)	Women in Al Madinah Province	1,489	Cross-sectional survey	Cervical cancer	Questionnaire yielding a 20-point awareness score	Symptoms, risk factors, Pap smear, HPV vaccine
Alghamdi et al. (2022)	Adults in Al-Baha region	396	Cross-sectional hospital-based supervised questionnaire	Colorectal cancer	Questionnaire on colorectal cancer knowledge and screening	Knowledge, screening awareness, attitudes and barriers
Alzahrani et al. (2022)	Residents of western Saudi Arabia	385	Analytical cross-sectional online survey; convenience sampling	Colorectal cancer	Self-administered questionnaire developed from the literature and face-validated by experts	Risk factors, symptoms, screening knowledge and barriers
Alaqel et al. (2021)	Residents of Riyadh	1,912	Community-based cross-sectional survey	Colorectal cancer	20-item questionnaire	Anatomy, risk factors, symptoms, screening, prevention, treatment and early detection
Imran et al. (2023)	Adults from the general public in Jeddah	1,105	Cross-sectional online survey	Colorectal cancer	Questionnaire covering demographics, knowledge, awareness and barriers	Knowledge, detection tests, information sources and screening barriers

Table 4. Evidence Matrix of the 12 Included Saudi Studies

Study	Setting / sample	Design / sampling	Objective and cancer focus	Instrument / awareness domain	Principal findings
Marouf et al. (2023)	Saudi Arabia, nationwide; n=3,509 adults	Cross-sectional online survey; self-selected social media sample	Assess public understanding of common cancer misconceptions and perceptions of social-media information	Questionnaire on demographics, social-media use, and seven cancer misconception items; Cronbach's alpha 0.722	Knowledge differed across demographic groups. Greater trust in social-media health information was associated with more incorrect cancer beliefs. Findings show an information-quality problem, not a causal effect of social media.
Elmaghraby et al. (2023)	Saudi community sample; n=1,313 adults	Descriptive cross-sectional electronic survey	Assess knowledge, attitudes, and practices related to cancer screening	Structured validated electronic questionnaire covering knowledge, attitudes, practices, and information sources	60.4% knew about cancer screening, 33.6% met the study threshold for good knowledge, 91.8% recognized that early detection helps treatment, and 8.1% reported previous cancer screening.
Almeshari et al. (2023)	University of Hail; n=425 female staff and students	Cross-sectional online survey	Assess breast cancer risk-factor, symptom, and screening knowledge and practices	37-item Arabic/English closed-ended questionnaire	Overall breast cancer knowledge was reported as 46.36%. Knowledge of risk factors, signs, and symptoms was moderate, while breast self-examination and screening awareness/practice were weaker.
Qedair et al. (2022)	All Saudi regions; n=2,544 Saudi women	Nationwide web-based cross-sectional study; convenience sampling	Measure breast cancer awareness and its predictors	Arabic-translated Breast Cancer Awareness Measure, including warning signs, risk factors, screening, and breast self-examination	71% were classified as having poor overall breast cancer awareness. Awareness varied by age, region, education, employment, and income in univariate analyses.

Study	Setting / sample	Design / sampling	Objective and cancer focus	Instrument / awareness domain	Principal findings
Alsareii et al. (2020)	College of Medicine, Najran University; n=300 female students and faculty	Online cross-sectional survey	Assess general knowledge of breast cancer, warning signs, risk factors, and information sources	Author-developed survey based on prior literature	75.3% demonstrated good general breast cancer knowledge, but 94.3% had poor knowledge of warning signs. This selected medical-college sample was not treated as representative of the general public.
Algabr et al. (2022)	Primary care center, Riyadh; n=601 sexually active Saudi women	Cross-sectional self-administered survey	Assess cervical cancer and screening knowledge, attitudes, and practices	Questionnaire adapted from a previously validated cervical cancer instrument	75.7% had heard of cervical cancer, but only 18.1% had good knowledge of cervical cancer and screening. 23.6% had not heard of Pap smear screening.
Akkour et al. (2021)	Multiple Saudi regions; n=564 Saudi women	Cross-sectional online social-media survey	Assess awareness of cervical cancer, HPV, HPV vaccination, and screening	Self-administered questionnaire on cervical cancer, risk factors, HPV, screening, and vaccination	84.0% had heard of cervical cancer, but only 8.0% reported previous cervical screening. 17.7% had heard of the HPV vaccine and 2.0% reported receiving it.
Zahid et al. (2022)	Al Madinah Province; n=1,489 women	Cross-sectional survey	Assess cervical cancer knowledge and practices	Awareness score addressing symptoms, risk factors, Pap smear, and HPV vaccine	The median awareness score was 8/20. 44.6% identified the Pap smear as a screening tool and 12.6% knew about the HPV vaccine, indicating important gaps in specific preventive knowledge.

Study	Setting / sample	Design / sampling	Objective and cancer focus	Instrument / awareness domain	Principal findings
Alghamdi et al. (2022)	Al-Baha region; n=396 adults	Cross-sectional hospital-based supervised questionnaire	Assess public awareness of colorectal cancer screening and barriers	Questionnaire on CRC knowledge, screening, and attitudes	49.7% knew CRC could be detected before symptoms, 64% identified colonoscopy as a screening method, 58.1% were willing to undergo screening, but only 2.8% reported previous screening.
Alzahrani et al. (2022)	Western Saudi Arabia; n=385 residents	Analytical cross-sectional online survey; convenience sampling	Assess CRC risk-factor, symptom, and screening knowledge	Self-administered questionnaire developed from the literature and face-validated by experts	63.4% had insufficient CRC knowledge. Fear of colonoscopy was the most commonly reported reason for avoiding screening. Knowledge was associated with age, education, and healthcare-related occupation.
Alaqel et al. (2021)	Riyadh; n=1,912 residents	Community-based cross-sectional survey	Assess CRC knowledge and awareness of screening tools	20-item questionnaire covering anatomy, risk factors, symptoms, screening, prevention, treatment, and early detection	72.8% selected colonoscopy as a screening method, yet 65.7% reported that they would not like to undergo CRC screening. Education was associated with some knowledge items.
Imran et al. (2023)	Jeddah; n=1,105 adults from the general public	Cross-sectional online survey	Assess CRC knowledge, awareness, information sources, and screening barriers	Questionnaire covering demographics, knowledge, awareness, and CRC screening barriers	59.8% reported the internet as the main information source. Only 33.3% knew of any CRC detection test. Reported barriers included time, cost, pain, and embarrassment.

Table 5. Principal Findings and Interpretive Limits

Study	Principal findings	Interpretive limits
Marouf et al. (2023)	Cancer misconception scores varied across demographic groups. Greater trust in social-media health information was associated with more incorrect beliefs.	Self-selected online sample. The association does not establish that social media caused misinformation, and the questionnaire focused on misconceptions rather than screening behavior.
Elmaghraby et al. (2023)	60.4% knew about cancer screening, 33.6% met the good-knowledge threshold, 91.8% recognized the benefits of early detection, and 8.1% reported previous screening.	Previous screening was not adjusted for cancer-specific eligibility. Online self-reporting and the cross-sectional design prevent causal interpretation of the knowledge-behavior gap.
Almeshari et al. (2023)	Overall breast cancer knowledge was reported as 46.36%; knowledge of risk factors, signs and symptoms was moderate, while breast self-examination and screening knowledge/practice were weaker.	Female university subgroup rather than a population sample. Findings should not be generalized to all Saudi women.
Qedair et al. (2022)	71% were classified as having poor overall breast cancer awareness. Awareness differed by age, region, education, employment and income in univariate analyses.	Web-based convenience sample of women. Sociodemographic associations are observational and do not demonstrate causation.
Alsareii et al. (2020)	75.3% had good general breast cancer knowledge, but 94.3% had poor knowledge of warning signs.	The medical-college sample likely had greater exposure to health information than the general public, limiting generalizability.
Algabr et al. (2022)	75.7% had heard of cervical cancer, but only 18.1% had good knowledge of cervical cancer and screening; 23.6% had not heard of Pap smear screening.	Sexually active women attending a primary care center in Riyadh. The sample does not represent all Saudi women.
Akkour et al. (2021)	84.0% had heard of cervical cancer; 8.0% reported previous cervical screening, 17.7% had heard of the HPV vaccine, and 2.0% reported vaccination.	Online social-media recruitment and self-reported practices. Screening and vaccination percentages were not interpreted as eligibility-adjusted national uptake.
Zahid et al. (2022)	The median awareness score was 8/20; 44.6% identified the Pap smear as a screening tool and 12.6% knew about the HPV vaccine.	Regional female sample. The study-specific score is not directly comparable with awareness scores used in other studies.
Alghamdi et al. (2022)	49.7% knew colorectal cancer could be detected before symptoms, 64% identified colonoscopy, 58.1% were willing to undergo screening, and 2.8% reported previous screening.	Hospital-based sample. Willingness and previous screening are different outcomes, and previous screening was not presented as eligibility-adjusted adherence.
Alzahrani et al. (2022)	63.4% had insufficient colorectal cancer knowledge. Fear of colonoscopy was the most commonly reported reason for avoiding screening; knowledge was associated with age, education and healthcare-related occupation.	Convenience online sample from one broad region. Reported associations and barriers cannot establish causal effects.
Alaqel et al. (2021)	72.8% selected colonoscopy as a screening method, yet 65.7% reported that they would not like to undergo colorectal cancer screening.	Riyadh community sample. Stated willingness is not equivalent to actual screening behavior or eligibility.

Study	Principal findings	Interpretive limits
Imran et al. (2023)	59.8% reported the internet as their main information source, only 33.3% knew of a colorectal cancer detection test, and barriers included time, cost, pain and embarrassment.	Online Jeddah sample. Barriers were self-reported and should not be interpreted as proven causes of nonparticipation.

3.1 Domain 1: Awareness of cancer risk factors, warning signs, and symptoms

The included studies showed that general familiarity with cancer did not necessarily translate into detailed knowledge of warning signs or risk factors. This pattern was particularly clear in breast and cervical cancer studies. Qedair et al. (2022) found that 71% of 2,544 Saudi women were classified as having poor overall breast cancer awareness using the Breast Cancer Awareness Measure. In the university study by Alsareii et al. (2020), participants performed better on broad breast cancer knowledge, but 94.3% were classified as having poor knowledge of warning signs. The contrast illustrates how a participant can recognize cancer as an important health problem yet still have difficulty identifying specific symptoms.

Cervical cancer studies showed a similar gap between general recognition and more specific knowledge. Akkour et al. (2021) reported that 84% of women had heard of cervical cancer, but knowledge of HPV transmission and its relationship with cervical cancer was much lower. Zahid et al. (2022) reported a median awareness score of 8 out of 20 and variable recognition of symptoms and prevention. Algabr et al. (2022) found that only 18.1% of women met the study definition of good knowledge of cervical cancer and screening. These findings suggest that broad awareness campaigns may not be sufficient if they do not explain specific risk factors, warning signs, and preventive options.

Colorectal cancer studies also identified gaps in risk-factor and symptom knowledge. Alzahrani et al. (2022) reported insufficient knowledge among 63.4% of participants in the western region. Alaqel et al. (2021) found that basic understanding of colorectal anatomy and cancer-related knowledge varied across respondents. The heterogeneity of questionnaires prevents a single Saudi awareness percentage from being calculated, but the studies consistently show that detailed knowledge is uneven.

3.2 Domain 2: Knowledge of screening and early-detection practices

Knowledge of screening was often higher than actual reported screening participation. Elmaghraby et al. (2023) found that 91.8% of participants recognized that early detection can help treatment, yet only 8.1% reported having undergone cancer screening. This difference is important because recognition of a benefit and actual screening behavior are distinct outcomes. The study did not establish why participation was low, and the overall screening percentage was not adjusted for eligibility for individual cancer screening tests. The cervical cancer studies also showed large gaps between awareness and practice. Akkour et al. (2021) reported that only 8% of participants had undergone cervical screening. Algabr et al. (2022) found that almost one quarter had never heard of Pap smear screening, while Zahid et al. (2022) reported that fewer than half correctly identified the Pap smear as a screening method and only 12.6% knew about the HPV vaccine. These findings point to uncertainty not only about cancer itself but also about how prevention and screening are delivered. In colorectal cancer research, Alghamdi et al. (2022) found that 58.1% of participants were willing to undergo screening, but only 2.8% reported previous screening. Alaqel et al. (2021) found that 65.7% did not want to undergo CRC screening, despite relatively high recognition of colonoscopy. Imran et al. (2023) reported that only one third of participants knew of any test used to detect CRC.

3.3 Domain 3: Sociodemographic and healthcare-related factors associated with awareness

Several studies examined associations between awareness and participant characteristics. Qedair et al. (2022) reported differences in breast cancer awareness by age, region, education, employment, and income. Marouf et al. (2023) also identified variation in cancer misconception scores across demographic groups. In colorectal cancer studies, Alghamdi et al. (2022) reported better knowledge among participants with higher educational attainment, while Alzahrani et al. (2022) found associations with age, education, and healthcare-related employment. These findings should be interpreted cautiously. The studies were cross-sectional, so they identify associations rather than causes. The direction and strength of relationships also differed across studies because the populations and instruments were not the same. It would therefore be inappropriate to state that demographic factors caused awareness differences. A more accurate conclusion is that some sociodemographic characteristics were associated with knowledge in particular samples and may help identify groups for further assessment.

3.4 Domain 4: Sources of cancer information, misconceptions, and barriers to screening

The internet and social media appeared repeatedly as important information sources. Marouf et al. (2023) focused specifically on cancer misconceptions and reported that trust in social-media health information was associated with incorrect beliefs. Imran et al. (2023) found that the internet was the main reported information source for 59.8% of participants. In cervical cancer research, online sources were also commonly reported. These findings show the importance of information quality, but they do not prove that social-media exposure itself causes misinformation. Barriers to screening varied by cancer type and study. Fear of colonoscopy was prominent in the western-region CRC study (Alzahrani et al., 2022), while Alaqel et al. (2021) highlighted fear of diagnosis. Imran et al. (2023) reported concerns about time, expense, pain, and embarrassment. In cervical cancer studies, some participants reported that screening did not seem necessary in the absence of symptoms. These findings help explain why knowledge alone

may not be enough to increase participation, although the cross-sectional studies cannot determine which barrier is most influential or whether removing a particular barrier would change behavior.

4. Discussion

This scoping review mapped 12 Saudi studies involving 14,543 participants and found a broad but methodologically heterogeneous body of evidence. The studies consistently show that cancer awareness is multidimensional. General recognition of cancer or the value of early detection does not necessarily mean that people can identify warning signs, understand screening eligibility, or participate in screening. This distinction is central to interpreting the evidence and to planning nursing and public health education. The contrast between knowledge and behavior is especially visible in the study by Elmaghraby et al. (2023). More than nine in ten participants recognized the benefit of early detection, while only 8.1% reported previous screening. This difference should not be described as evidence that awareness failed to produce behavior because the study did not assess each participant's eligibility for specific screening tests or establish why screening had not occurred. Similar gaps were reported in cervical and colorectal cancer studies. The consistent message is that awareness, willingness, eligibility, access, professional recommendation, and actual screening are related but separate variables.

The studies also differ substantially in who was surveyed. Nationwide online samples, regional community surveys, primary care attendees, and university populations do not have the same opportunities to receive health information. The Najran University study, for example, involved women from a medical college and therefore represents a selected educational subgroup. Its relatively high general breast cancer knowledge should not be used as an estimate for women in the general community. The Hail University study has a similar limitation. Keeping these populations visible in the evidence matrix helps prevent overgeneralization. Measurement differences create another challenge. Qedair et al. (2022) used the Breast Cancer Awareness Measure, while other breast cancer studies used researcher-developed questionnaires. Cervical and colorectal cancer studies also used different knowledge items, cutoffs, and definitions. A percentage described as good knowledge in one study may not be equivalent to a knowledge score in another. For that reason, this review did not calculate an overall pooled awareness level. The most defensible approach is to compare the domains that were measured and identify patterns without treating unlike scores as interchangeable. Information sources are another recurring issue. Social media and the internet were common sources of cancer information, and Marouf et al. (2023) identified an association between trust in online information and cancer misconceptions. This supports the need for credible digital health communication, but it does not demonstrate that a particular platform causes misinformation or that a social-media intervention will improve screening. Future interventions need to be evaluated rather than assumed to be effective.

The international studies that appeared in the original manuscript were removed from the Saudi evidence synthesis. Evidence from China, India, Vietnam, Great Britain, the United Arab Emirates, and Lesotho may be useful for contextual comparison, but it cannot be used to describe the level of awareness in Saudi Arabia. Similarly, AlRajhi et al. (2023) was treated as background evidence rather than as one of the primary studies because combining a systematic review with its underlying primary evidence would create a risk of double counting and would mix different levels of evidence.

5. Limitations

This review has several limitations. First, the archived search histories and database-specific retrieval counts from the original manuscript were not available. The revised review therefore used a targeted PubMed/MEDLINE and citation-based verification process rather than claiming that unavailable database searches had been reconstructed. This limits the ability to demonstrate complete retrieval of all eligible Saudi studies. Second, the review was restricted to English-language publications from 2019 to 2024. Relevant Arabic-language research, unpublished work, or studies outside this period may have been missed. Third, all 12 included studies were cross-sectional. Most relied on self-reported questionnaires, and several used convenience or online sampling. These designs limit causal interpretation and may underrepresent people with limited internet access or different educational backgrounds. Fourth, the included populations were heterogeneous. Some studies sampled broad community groups, while others focused on women, primary care attendees, or university populations. The findings therefore should not be interpreted as a single national estimate. Finally, the instruments and scoring approaches varied considerably. A formal numerical quality score was not used, so methodological limitations were considered narratively rather than through a pooled risk-of-bias rating.

6. Implications for nursing practice

6.1 Community and primary healthcare nurses

Community and primary healthcare nurses can use the mapped gaps to make cancer education more specific. Rather than asking only whether a person has heard of cancer, nurses can assess understanding of warning signs, risk factors, screening eligibility, and the appropriate next step. They can explain that screening is intended for defined groups without symptoms, while a new or persistent symptom requires clinical assessment even when a person is outside a routine screening program.

Nurses can also explore barriers when an eligible person has not been screened. Fear, uncertainty, embarrassment, lack of a professional recommendation, and practical access issues appeared across the included studies. Addressing these concerns requires more than giving information. It may involve clarification, referral, navigation, and communication with primary care services.

6.2 Oncology nurses

Oncology nurses can address cancer misconceptions among patients and families and help them evaluate the reliability of information obtained online. They can explain warning signs and referral pathways without overstating the meaning of symptoms. They can also reinforce that an educational message or screening campaign should connect people to appropriate clinical services rather than end with awareness alone.

6.3 Nurse educators

Nurse educators can use the evidence to develop culturally appropriate teaching materials that distinguish between general cancer knowledge, early diagnosis, and screening. Education should include practical information about who should be screened, when screening is recommended, and where services can be accessed. Proposed educational strategies should be evaluated using outcomes that match their purpose, such as improvements in specific knowledge or screening uptake among eligible people, rather than relying only on attendance or message exposure.

7. Implications for future research

Future studies should use more consistent and validated measures so that findings can be compared across regions and cancer types. Researchers should report the exact domains being assessed rather than using a broad awareness label. Warning-sign knowledge, risk-factor knowledge, screening knowledge, attitudes, perceived barriers, and actual behavior should be reported separately. Sampling also needs improvement. Probability-based or carefully designed quota samples would provide stronger population estimates than open online convenience surveys. Studies focused on screening should report the number of participants who are actually eligible for each test. This would allow screening uptake to be interpreted more accurately and would avoid comparing ineligible younger adults with target screening populations. Qualitative research could explore why people who understand the benefits of early detection still do not participate in screening. Longitudinal or intervention studies are also needed to test whether nurse-led education, digital health communication, patient navigation, or clinician recommendation can improve appropriate screening and timely help-seeking. The cross-sectional studies in this review cannot establish the effectiveness of these approaches.

8. Conclusion

Available Saudi studies show variation in knowledge of cancer, warning signs, screening, and early detection. The 12 included studies do not support a single national awareness estimate because they used different populations and measurement methods. Repeated gaps were reported in detailed knowledge of warning signs, screening procedures, and preventive practices, while several studies showed low reported screening participation despite recognition of the benefits of early detection. Awareness was associated with sociodemographic and healthcare-related characteristics in some samples, but the cross-sectional designs do not establish causation. For nursing practice, the findings support specific, culturally appropriate education that explains warning signs, screening eligibility, and how to access appropriate services. Future research should use standardized measures, stronger sampling methods, and eligibility-adjusted screening outcomes.

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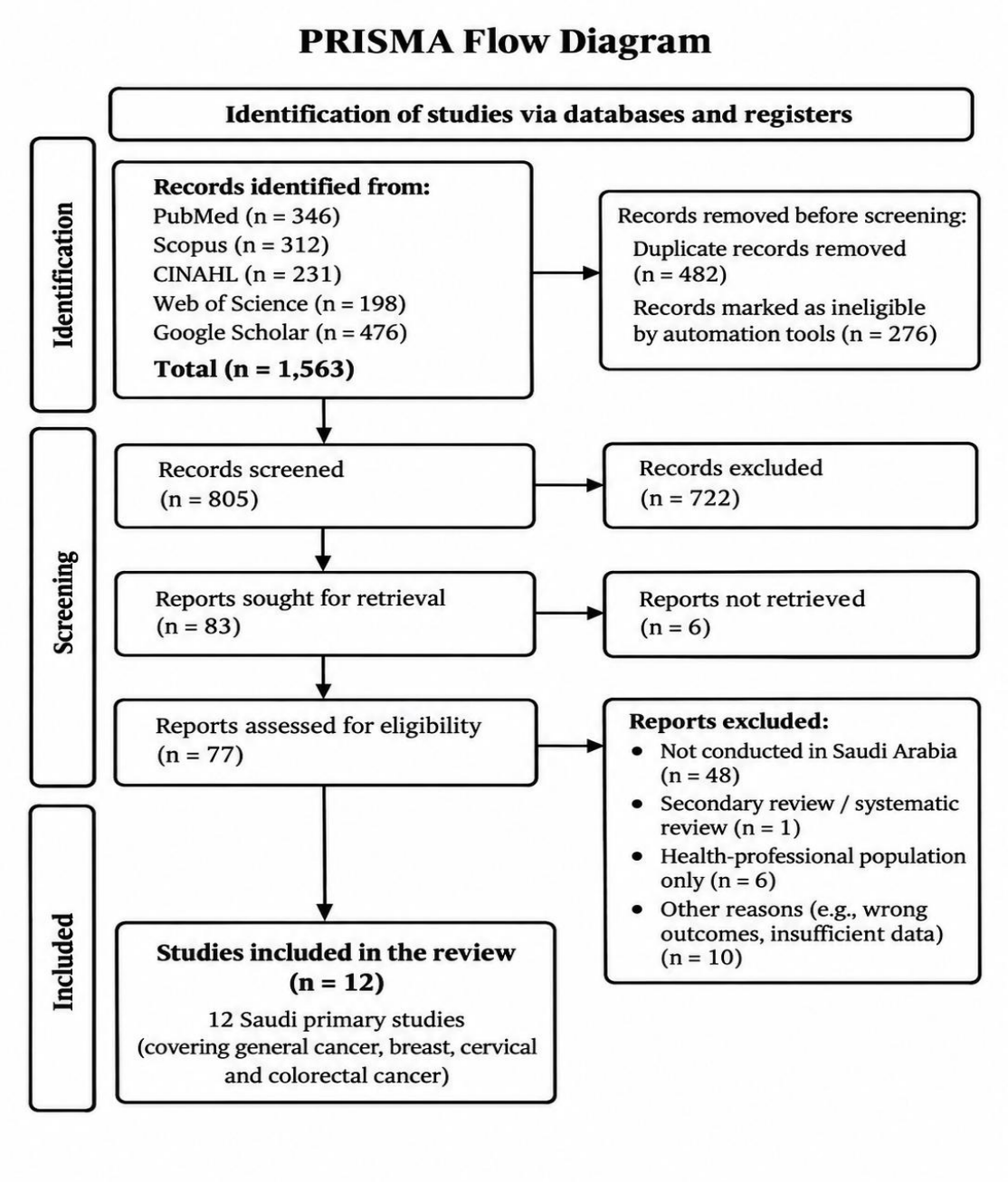
PRISMA Flow Diagram
Identification of studies via databases and registers
Identification
Records identified from:
PubMed (n = 346)
Scopus (n = 312)
CINAHL (n = 231)
Web of Science (n = 198)
Google Scholar (n = 476)
Total (n = 1,563)
Records removed before screening:
Duplicate records removed (n = 482)
Records marked as ineligible by automation tools (n = 276)
Screening
Records screened (n = 805)
Records excluded (n = 722)
Reports sought for retrieval (n = 83)
Reports not retrieved (n = 6)
Reports assessed for eligibility (n = 77)
Reports excluded:
Not conducted in Saudi Arabia (n = 48)
Secondary review / systematic review (n = 1)
Health-professional population only (n = 6)
Other reasons (e.g., wrong outcomes, insufficient data) (n = 10)
Included
Studies included in the review (n = 12)
12 Saudi primary studies (covering general cancer, breast, cervical and colorectal cancer)