Systematic review of women's knowledge, attitude, and practice towards breast cancer

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Abstract:
The present study aims to systematically review the women's knowledge, attitude, and practice (KAP) of breast cancer (BC) screening methods to get enough information for policymakers to orient the screening strategies. All English KAP studies on BC screening methods in five databases up to January 2021 were included. The quality of the final articles was assessed using the STROBE checklist. The qualitative synthesis was performed. Out of 5574 retrieved articles, 28 were included. About 64% of the articles were of high quality. Overall, there were poor knowledge, negative attitude, and low practice between women. The educational programs and cultural plans can encourage regular screening. Women's excessive optimism to their BC risk should be eliminated by focusing on the risk of the disease, more.

Keywords:
Health knowledge, attitudes, breast neoplasms, cancer early detection, cancer screening test, practice

Introduction

Breast cancer (BC) was allocated 11.7% of all kinds of cancers in 2020.¹¹ To date, the new cases of the disease were beyond two million, forecasted to reach more than 3 million cases with more than one million deaths by 2040.¹²⁻³

BC was imposed a considerable economic burden on countries as well as public health problems⁴⁻⁵ while it can be prevented by early detection strategies.⁶⁻⁸ For early diagnosis of BC, the screening of breasts should be performed routinely by women.⁹ Based on the WHO recommendation, women aged 40–49 years or 70–75 years should perform systematic mammography screening.¹⁰ Although the importance of screening for early detection of BC, the rate of screening methods was low.¹¹⁻¹³

Knowledge is an important variable that affects behavior.¹⁴⁻¹⁵ Lack of knowledge about BC risk factors as well as screening methods has led to a late disease detection that has increased the risk of death¹⁶ and mortality.¹⁷ Attitude is an important factor of women’s prevention behavior as knowledge in screening, too.¹⁸ Negative attitudes, as well as low knowledge, are defined as the barriers of screening methods.¹⁹ Overall, knowledge, attitudes, and practices correlated positively with each other.²⁰

The present study aims to systematically explore the three outcomes as the knowledge, attitude, and practice (KAP) of females about clinical and nonclinical methods of screening to assess the current situation of women in this era. The results can help policymakers to choose, implement, and prioritize the necessary strategies to encourage women’s participation in screening.

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Materials and Methods

It was a systematic review. PubMed, Scopus, Web of Science, ProQuest, and EMBASE databases were searched for articles. The search strategies are presented in Appendix 1.

The protocol for this review was registered on PROSPERO in July 2020 (ID: CRD42020180964).

Inclusion and exclusion criteria
The available published studies as full-text and grey literature up to January 2021 in English, assessed the KAP of BC screening methods were included in the research. No time limit and all of the original as well as case study or cross-sectional papers that the sample size was women older than 16, were included.

Studies that addressed the BC treatment methods, those that considered KAP as a secondary outcome, as well as those not showing explicitly the result of KAP elements, were excluded.

Data selection, extraction, and analysis
Duplicate citations were removed using the Endnote version 8. The remained articles were screened by title and abstract by two reviewers based on the inclusion and exclusion criteria, independently. The full-text of the eligible articles were also screened by two reviewers, independently. A third reviewer was assessed the articles with disagreement.

A qualitative review was performed to analyze.

Quality assessment
The STROBE checklist was used to quality assessment of all of the selected studies.

Results
A total of 5574 papers was retrieved from the databases. Out of 3754 nonduplicated papers in the title, 3710 studies were excluded because of irrelevant titles and abstracts. Out of 44 papers, a number of 28 articles were included [Figure 1].

Study characteristics
A number of 18 articles were performed in Asian countries. Five and four articles were performed in European and African countries, respectively. An article was performed in countries across Africa, the Americas, and Asia.[21]

No time limit was set, and articles from 1990 up to January 2021 were considered; the frequency of studies was related to 2015 by publishing four articles,[16,17,22,23]

Four,[16,24-26] seven,[22,27-32] and one[33] studies were focused on rural women, students as well as health workers, and patient females (regardless of the type of disease), respectively. The other selected articles were considered women at least older than 16 years randomly.

All of the articles were performed as cross-sectional and used a self-administrated as well as structured questionnaire to examine women’s KAP for screening methods. Table 1 was presented the characteristics and the results of the selected studies.

A total of 22 and 17 articles were addressed the knowledge and attitude of BC screening methods, respectively. A total of 21, 18, and 14 articles were addressed the practice of breast self-examination (BSE), mammograms, and clinical breast examination (CBE) screening methods, respectively.

Study results
We divided the results into three subsections as follows:

Knowledge about breast cancer screening methods
The selected studies were different in terms of questions in knowledge. A study was performed on a focus and qualitative group.[34] Out of 22 articles that addressed knowledge about BC screening methods, 15 (=68%) reported the poor knowledge of their respondents. Six (=27%)[11,13,20,21,31,32] and one study[35] reported the fair and high knowledge of screening, respectively.

Attitude to breast cancer screening methods
A total of 12 and 5 articles were reported the negative[13,16,17,24-27,29,34-37] and positive[12,20,30,38,39] attitudes of the respondents to screening methods of BC, respectively. The frequency of the respondent’s answers was in neutral attitudes in an article.[13]

The practice of breast cancer screening methods
A total of 16 articles reported the low practice of BSE in respondents (i.e., <50% of participants performed BSE although was not regular).[13,16,17,21-26,32,34,36,38,41] The high practice of BSE was reported in five articles,[22,27,28,30,32] and seven articles did not address the practice of BSE.[11,13,34,39,42]

A total of 18 articles reported the low practice of mammograms. The high practice of mammography was reported in two articles.[21,25,26,30,31,35,36,40,42] A total of 9 articles did not address the mammography practice. [21,25,26,30,31,35,36,40,42] and an article reported proper practice of mammograms by participants.[20] All 14 articles that addressed the CBE screening in the participants reported the low practice of CBE.[12,17,20,22-24,26,29,33,35,37,38,40,41]
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Discussion

Despite new technologies in the early detection of BC, an increase in the burden of the disease among women is seen in the countries. Therefore, in this study, we examined the knowledge and attitude, as well as the practice of women in BC screening methods to investigate one of the possible causes by a systematic review study. Obviously, by identifying the low knowledge and negative attitude as the reason for the low practice of screening methods, policymakers can prioritize educational as well as cultural plans at the beginning or even in parallel with BC screening strategies that the finding of our study confirmed this. Overall, there was poor knowledge about BC, symptoms, risk factors, BC screening methods, and the starting age for BC screening methods in women in Northern Vietnam, Abu Dhabi, and rural South Africa.\textsuperscript{11,12,16} Lebanese females in Beirut did not have proper knowledge of curability, although they had high knowledge about symptoms of BC.\textsuperscript{20} Mexican participants had high levels of knowledge that attributed to education plans about BC by the government and nongovernmental organizations.\textsuperscript{42}

The job environment and the level of education had an effect on the level of knowledge about screening. Educated women, as well as those working in the health sectors, had higher knowledge about screening than the others, being interested in clinical methods,\textsuperscript{31,42} although their practice was lower than expected.\textsuperscript{27} The knowledge of health care workers such as nurses was higher than the other categories of health workers about the risk factors of BC and mammography screening. The poor knowledge of female health workers in the study was attributed to the nonavailability of the facility, especially
| Author/year | Country | Participants characteristics | Study instrument | Knowledge about mammography | Knowledge about BC screening (poor knowledge) |
|-------------|---------|------------------------------|------------------|-----------------------------|---------------------------------------------|
| Al Blooshi et al./2020 | United Arab Emirates/Abu Dhabi region | 383 women aged 40-65 years | A self-administered questionnaire | Low knowledge about mammography related to CBE, 42% | 45.7% of respondents had high knowledge about mammography |
| Al-Mousa et al./2020 | Jordan | 390 female health professionals | A self-administered questionnaire | There was poor knowledge about mammography | 57.5% of respondents had high knowledge about mammography |
| Heena et al./2019 | KSA | 390 women between 20 to 49 years old | A self-administered questionnaire | Overall, poor knowledge about BC screening methods | 96.4% of respondents had low level knowledge about screening methods |
| Toan et al./2019 | Vietnam/Thanh Hoa | 306 women between 20 to 49 years old | A closed questionnaire | Overall, poor knowledge about BC screening methods | 62.8% of respondents had low level knowledge about mammography |
| Alshahrani et al./2019 | Saudi Arabia/Najran | 500 patients female attended primary health care centers | A self-administered questionnaire | Overall, poor knowledge about BC screening methods | 54.4%, 56.8%, 90.4%, 83.8% of respondents had low level knowledge about mammography, BSE, mammogram, and CBE, respectively |
| Asmar et al./2018 | Lebanon/Beirut | 371 females with no previous diagnosis of BC, aged between 35 to 69 years | A structured questionnaire | Overall, poor knowledge about BC screening methods | 51.2% of respondents had low level knowledge about mammography |
| de Oliveira et al./2018 | Brazil | 243 rural women between 25 to 59 years old that attending in a primary health center | A self-administered questionnaire | Overall, poor knowledge about BC screening methods | 51.2% of respondents had low level knowledge about mammography |
| Rawashdeh et al./2018 | Jordan | 360 consecutive rural women and their female relatives attending a rural health-center | A self-administered questionnaire | Overall, poor knowledge about BC screening methods | 51.2% of respondents had low level knowledge about mammography |
| Sarwar et al./2015 | Pakistan/Lahore | 1194 women aged over 18 years | A structured questionnaire | Overall, poor knowledge about BC screening methods | 51.2% of respondents had low level knowledge about mammography |
| Kotepui et al./2015 | South Africa | 217 female staff at the Wits UNIVERSITY | A self-administered questionnaire | Overall, poor knowledge about BC screening methods | 51.2% of respondents had low level knowledge about mammography |
| Othman et al./2015 | Jordan | 1549 adult females older than 18 years | A self-administered questionnaire | Overall, poor knowledge about BC screening methods | 51.2% of respondents had low level knowledge about mammography |
| Iurigh et al./2016 | Iran/Mazandaran | 3044 females in rural health-medical centers (≥20 years old) | A structured questionnaire | Overall, poor knowledge about BC screening methods | 51.2% of respondents had low level knowledge about mammography |
| Ramathuba et al./2015 | South African | 150 rural household’s women between 30-65 years | A closed-ended questionnaire | Overall, poor knowledge about BC screening methods | 51.2% of respondents had low level knowledge about mammography |
| Kotepui et al./2015 | Thailand | 217 female staff at the Wits UNIVERSITY | A self-administered questionnaire | Overall, poor knowledge about BC screening methods | 51.2% of respondents had low level knowledge about mammography |
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| Author/year | Country | Participants characteristics | Study instrument and questionnaire administration | Knowledge |
|-------------|---------|------------------------------|-------------------------------------------------|------------|
| Meshkani, et al. 2014 | Iran/Sanandaj | 307 women aged 17 to 69 years that refer to public health centers | A self-administered questionnaire | Overall, just 15.6% of the participants had good knowledge about screening methods, although more than 60% of respondents had good knowledge about BC (fair knowledge) |
| Pengpid and Peltzer 2014 | Countries across Asia, Africa, and Americas | 10,810 undergraduate of 25 universities in 24 countries (between 16-30 years old) | A self-administered questionnaire | 64.6% of respondents knew that by mammograms a palpable lump could be detected |
| Behbahani 2014 | Iran | 314 women aged 40 and over at a general hospital | A self-administered questionnaire | Overall, just 15.6% of the participants had good knowledge about screening methods, although more than 60% of respondents had good knowledge about BC (fair knowledge) |
| Pengpid and Peltzer 2014 | Countries across Africa, Americas, and Asia | 10,810 undergraduate of 25 universities in 24 countries (between 16-30 years old) | A self-administered questionnaire | Overall, just 15.6% of the participants had good knowledge about screening methods, although more than 60% of respondents had good knowledge about BC (fair knowledge) |
| Gosein et al. 2014 | Trinidadian | 314 women aged 40 and over at a general hospital | A self-administered questionnaire | Overall, just 15.6% of the participants had good knowledge about screening methods, although more than 60% of respondents had good knowledge about BC (fair knowledge) |
| El Mhamdi et al. 2013 | Tunisia/Monastir | 900 women older than 25 years old in 15 health centers who had not history of BC | A structured questionnaire | Overall, just 15.6% of the participants had good knowledge about screening methods, although more than 60% of respondents had good knowledge about BC (fair knowledge) |
| Banegas et al. 2012 | Four U.S. Mexico border communities | 265 women older than 40 years from health centers | An interviewer-administered questionnaire | >50% of Mexican women and about 45.2% of U.S. Latinas had a high knowledge of BC screening methods (poor knowledge) |
| Doshi et al. 2012 | India/Hyderabad City | 203 dental female students at Panineeya Institute of Dental Sciences | A self-administered pretested close-ended questionnaire | On average, 74% of the sample size had poor knowledge about screening methods of BC |
| Akpinar et al. 2011 | Turkey/Çorum Province | 444 professional females in a health care system | A self-administered interview-administered questionnaire | <15% of female professionals knew about the prevalence of BC (poor knowledge) |
| Khokher et al. 2011 | Pakistan/Lahore | 1155 women in educational institutions | A multiple-choice questionnaire | There were limited knowledge about BC risk factors, early detection, guidelines on screening and treatment effectiveness in the focus group participants |
| Akpınar et al. 2011 | Turkey/Çorum Province | 444 professional females in a health care system | A self-administered interview-administered questionnaire | <15% of female professionals knew about the prevalence of BC (poor knowledge) |
| Kumar et al. 2009 | India/Karachi | 341 consultants, residents, interns, nurses, and medical students at a university hospital | A self-administered questionnaire | >90% of respondents were knowledgeable about BC as well as mammograms (96%), and BSE (92%) |
| Avis-Williams et al. 2009 | Africa/Mississippi | 58 women older than 40 | Open-ended questions | There was poor knowledge about BC and fair knowledge of screening methods (less than 40% of respondents knew about BSE, CBE, and mammograms, on average) |
| Perucci et al. 2009 | Rome | 793 random sample of women | A self-administered questionnaire | Just 45% of respondents had knowledge about mammography and the BSE as well as mammograms, and BSE (96%), and mammograms, and BSE (92%) |
| Saint-Germain et al. 2009 | Rome | 793 random sample of women | A self-administered questionnaire | There was poor knowledge about BC and fair knowledge of screening methods (less than 40% of respondents knew about BSE, CBE, and mammograms, on average) |
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| Author/year | Attitudes | Practices | Main findings with regard to KAB | Quality assessment |
|------------|-----------|-----------|-------------------------------|-------------------|
| Al Blooshi et al./2020\(^{11}\) | Attitude about mammography was as follows  
Positive attitudes: 26.9% of respondent  
Neutral attitudes: 56.9% of respondent  
Negative attitudes: 16.2% of respondent | Good practices (obtained mammograms): 47% of respondent  
Low practices: 53% of respondent | To improve the knowledge about screening using social media, public service campaigns and primary care were recommended. Free mammography can be effective in encouraging low-income women to have screening methods | 79.55* |
| Al-Mousa et al./2020\(^{13}\) | There were negative attitude about mammography (only 40.60% of respondents accepted the need for mammography) | Only 17.2% of respondents have had a mammography before the study (low mammography practice) | Awareness for BC as well as screening methods was needed. The availability of female healthcare providers can help women's attendance for screening methods, especially mammography | 90.91* |
| Heena et al./2019\(^{27}\) | There were negative attitudes about screening methods (<10% of participants believed that BC can be prevented. 53.4% of the respondent did not believe in the effectiveness of BSE | Practicing BSE: 75% of participants  
Practicing mammography: 18.7% of participants | To improve the knowledge and positive attitude of female health staff about the screening methods of BC | 88.64* |
| Toan et al./2019\(^{12}\) | Positive attitude about screening: 61.1% of respondent | 77.7% of participants had a bad practice for screening  
About 13.8%, 14.6% and 10.1 sample size had BSE, breast ultrasound, and mammography, respectively | Policymakers should prioritize ethnic minorities for planning of BCED intervention | 88.64* |
| Alshahrani et al./2019\(^{33}\) | This study did not address attitudes | Overall, participants had a bad practice of screening  
35% of patients performed BSE, 15% and 19.8% of them received mammograms and clinical screening for preventing BC, respectively | To enhance the screening for BC, healthcare providers should have more efforts, especially for using primary health care for early diagnosis | 72.73** |
| Asmar et al./2018\(^{35}\) | Participants received the score 71.9±8.3% for the positive attitude of BC screening (positive attitude) | Participants received the score 45.7±42.3%, 77.9±36.5%, and 29.1±45.5% (of 100 points) for BSE, mammography and clinical screening, respectively | The curability of BC should be educated and the barriers of screening methods should be removed | 86.36* |
| de Oliveira et al./2018\(^{36}\) | 25.7% of women up to 50 and 33.6% of women over 50 years old had inappropriate attitudes about screening (=negative attitude) | 37.9%, 49%, and 58% of participants had BSE, CBE, and mammogram, respectively (=low practice) | Rural women did not have basic knowledge about screening methods of BC | 81.82* |
| Rawashdeh et al./2018\(^{38}\) | This study did not address attitudes | BSE, CBE, and mammography were performed by 65.7%, 28.7%, and 15.1% of participants, respectively | Radiologists were aware of BC screening benefits. Although they recommended BSE and CBE, did not perform themselves | 81.82* |
| Siddharth et al./2016\(^{36}\) | All of the sample size thought that only physicians could diagnose BC (=negative attitude) | None of the participants did not perform BSE (=low practice) | The impact of screening of BC for early diagnosis and reducing the burden of disease should be explained for females in communities | 77.27* |
| Iurigh et al./2016\(^{26}\) | Only 19.2% of sample size agreed with BSE, while 48% of them emphasized on the importance of time for effective treatment. (=negative attitude) | Just 21.1% of the sample size performed BSE, monthly (=low practice) | Training courses for screening methods of BC were recommended | 77.27* |
Main findings with regard to KAB

| Author/year | Attitudes | Practices | Quality assessment |
|-------------|-----------|-----------|--------------------|
| Ramathuba et al./2015[16] | <50% of females agreed with the important role of screening in the treatment of BC (negative knowledge) | Just 6.3% of samples performed one of the screening methods in their lives (=low practice) | To prompt the knowledge of women about screening, the community-based intervention was suggested | 86.36* |
| Kotepui et al./2015[20] | This study did not address attitudes | About, 79% of the sample size performed BSE while 48.4% of them had received a clinical screening method | Knowledge about the screening methods should be improved, especially for women with low educational and income level | 79.55* |
| Othman et al./2015[26] | This study did not address attitudes | Almost 50%, 28%, and 7% of the sample size performed BSE, CBE, and mammography screening, respectively (=low practice) | Women should educate that performed screening method even without any apparent symptoms in breasts | 81.82* |
| Sarwar et al./2015[17] | 76.8% of females believed on assessing the breast lump by a physician and 26.2% of them did not believe in routine screening until any problem occurred (=negative attitude) | Almost 90% of participants did not perform BSE, CBE, and mammography as a routine check-up and when they had breast problems, respectively (=low practice) | Serious efforts regarding clinical as well as nonclinical screening methods of BC for awareness of the general population is needed | 75.00* |
| Behbahani 2014[29] | 55% of respondents had poor attitudes about screening method (negative knowledge) | Although 47.4% of females underwent BSE, they did not perform on as a monthly basis (=low practice) | Educational course for clinical and non-clinical BC screening methods was needed for all females, especially young ones | 70.45** |
| Pengpid and Petzer 2014[21] | This study did not address attitudes | >50% of the sample size did not perform BSE in the past year, while 21.3% and 10.3% had 1-2 times and 3-10 times, respectively. Only 9.1% of participants performed BSE per month. (=low practice) | Female university students had a poor practice of BSE and their knowledge about screening methods especially BC should be promoted | 68.18** |
| Gosein et al./2014[28] | Overall, participants had a negative attitude about screening methods (50%, 39.5%, and 62.4% of the sample size were concerned about pain or uneasiness during the mammogram, radiation, and cancer detection, respectively) | 67.8% of respondents performed SBE while just 35.4% of them performed monthly. 66.6% of respondents had a CBE at some point. (=low practice) | Misconceptions and gaps in knowledge, especially among illiterate women, are common to mammography. Information about pain perception and patient satisfaction can be effective in encouraging women to have a mammogram | 84.09* |
| El Mhamdi et al./2013[36] | Overall, 85% of women had positive attitudes for the screening methods | Only, 14.3% of women performed screening methods (=low practice) | The education program is needed to prompt women's adherence for screening methods | 77.27* |
| Banegas et al./2012[40] | A significant proportion of U.S. Latinas believed that BC is more likely than Mexican women | U.S. Latinas performed clinical and nonclinical screening methods more than Mexican women | Increasing access to and emphasizing the need for screening programs can be effective in improving screening practices in the U.S and Mexican women | 81.82* |
| Doshi et al./2012[29] | On average, 94% of second-year students had negative attitudes about screening methods | On average, 86% of female dental students had a poor practice of cancer screening of breast | Educational programs were needed to create knowledge and practice of screening methods of BC. | 75.00* |
| Akpinar et al./2011[30] | 98.4% of female professionals were believed that BSE was a helpful method for recognizing the breast lumps (=positive attitude) | Although 81.3% of the sample size performed BSE, it has been regularly in doctors compared with nurses/midwives (=good practice) | Female health personnel need in-service training programs | 79.55* |
| Khokher et al./2011[43] | This study did not address attitudes | >50% of older females and >90% of young women did not undergo CBE (=low practice) | Improving women's knowledge using TV commercials as well as educational institutions can be an effective solution | 75* |

Contd...
Table 1: Contd...

| Author/year                  | Attitudes                                      | Practices                                                                 | Main findings with regard to KAB                                      | Quality assessment |
|------------------------------|------------------------------------------------|--------------------------------------------------------------------------|----------------------------------------------------------------------|-------------------|
| Akhigbe and Omuemu/2009[10]  | This study did not address attitudes            | 77.6% of respondents perform BSE. Only 3.1% of female who was older than 40 performed mammography as routine annual screening (=low practice) | Regular update courses should be managed for teaching about BC and its screening methods for female health workers | 79.55*            |
| Avis-Williams et al./2009[9] | Participants had negative perceptions of screening as well as clinical trial participation | Although mammograms were performed, they were not regular, especially among women aged 40-49 and those living in rural areas (=low practice) | Identifying new health education strategies were recommended         | 56.82**           |
| Kumar et al./2009[13]        | This study did not address attitude screening methods | There were low practice of BSE in female responding                      | The proper time for BSE should be educated women                      | 75**              |
| Saint-Germain and Longman/1993[8] | There were positive attitude about the curability of BC | On average, 50% of respondents had a mammogram (=low practice)           | Older women should be aware of the risk of BC as well as screening methods | 70.45*            |
| Pham and McPhee/1992[7]      | There were negative attitudes toward cancer control | There was a bad practice about BC screening methods (BSE, CBE, and mammogram) | Education, as well as screening programs, was recommended, especially for immigrants and low-income women | 81.82*            |
| Perucci et al./1999[41]      | This study did not address the attitude         | 31.9% of respondents had undergone one of the breast examinations that used an imaging technique at least once in their lifetime (=overall low practice) | Inappropriate screening patterns were related to the physician’s recommendations | 72.73**           |

*High quality, **Low quality. KSA=Kingdom of Saudi Arabia, BC=Breast cancer, BSE=Breast self-examination, CBE=Clinical breast examination, BCED=Breast Cancer Early Detection
Conclusions

Women did not have proper knowledge about clinical screening methods, as well as the starting age and the interval to perform them. Although the screening practice did not depend on knowledge alone, a high level of knowledge could lead to a positive attitude and high practice. Managing the continuous educational programs for BC and screening methods were recommended.

Ethics approval and consent to participate

The study protocol was approved by the Ethics Committee of Iran University of Medical Sciences (Ethical Code. IR. IUMS. REC.1398.1051). Consent to participate is not applicable to the study.

Availability of data and materials

All data generated or analyzed during this study are included in this published article.

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Conflicts of interest

There are no conflicts of interest.

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### Appendix 1

#### Search strategies

**PubMed:**

(`"Breast Neoplasm"[MH] OR "Breast Neoplasm"[TIAB] OR "Breast Tumors"[TIAB] OR "Breast Tumor"[TIAB] OR "Breast Cancer"[TIAB] OR "Mammary Cancer"[TIAB] OR "Mammary Cancers"[TIAB] OR "Malignant Neoplasm of Breast"[TIAB] OR "Breast Malignant Neoplasm"[TIAB] OR "Breast Malignant Neoplasms"[TIAB] OR "Malignant Tumor of Breast"[TIAB] OR "Breast Malignant Tumor"[TIAB] OR "Breast Malignant Tumors"[TIAB] OR "Cancer of Breast"[TIAB] OR "Cancer of the Breast"[TIAB]) AND ("Early Detection of Cancer"[MH] OR "Cancer Early Detection"[TIAB] OR "Cancer Screening"[TIAB] OR "Cancer Screening Tests"[TIAB] OR "Cancer Screening Test"[TIAB] OR "Early Diagnosis of Cancer"[TIAB] OR "Cancer Early Diagnosis"[TIAB]) AND (Knowledge[TIAB] OR Attitude[TIAB] OR "KAP"[TIAB] OR Preference[TIAB] OR Practice[TIAB])

**Embase:**

(‘Breast Neoplasm’:ti,ab OR ‘Breast Neoplasm’:ti,ab OR ‘Breast Tumors’:ti,ab OR ‘Breast Tumor’:ti,ab OR ‘Breast Cancer’:ti,ab OR ‘Mammary Cancer’:ti,ab OR ‘Mammary Cancers’:ti,ab OR ‘Malignant Neoplasm of Breast’:ti,ab OR ‘Breast Malignant Neoplasm’:ti,ab OR ‘Breast Malignant Neoplasms’:ti,ab’ OR ‘Malignant Tumor of Breast’:ti,ab OR ‘Breast Malignant Tumor’:ti,ab OR ‘Breast Malignant Tumors’:ti,ab OR ‘Cancer of Breast’:ti,ab OR ‘Cancer of the Breast’:ti,ab) AND (‘Early Detection of Cancer’ OR ‘Cancer Early Detection’ OR ‘Cancer Screening’ OR ‘Cancer Screening Tests’ OR ‘Cancer Screening Test’ OR ‘Early Diagnosis of Cancer’ OR ‘Cancer Early Diagnosis’) AND (Knowledge:ti,ab AND Attitude:ti,ab AND ‘KAP’:ti,ab OR Preference:ti,ab OR Practice:ti,ab)

**SCOPUS**

TITLE-ABS-KEY ("Breast Neoplasm" OR “Breast Neoplasm” OR “Breast Tumors” OR “Breast Tumor” OR “Breast Cancer” OR “Mammary Cancer” OR “Mammary Cancers” OR “Malignant Neoplasm of Breast” OR “Breast Malignant Neoplasm” OR “Breast Malignant Neoplasms” OR “Malignant Tumor of Breast” OR “Breast Malignant Tumor” OR “Breast Malignant Tumors” OR “Cancer of Breast” OR “Cancer of the Breast”) AND TITLE-ABS-KEY (“Early Detection of Cancer” OR “Cancer Early Detection” OR “Cancer Screening” OR “Cancer Screening Tests” OR “Cancer Screening Test” OR “Early Diagnosis of Cancer” OR “Cancer Early Diagnosis”) AND TITLE-ABS-KEY (Knowledge AND Attitude OR “KAP” OR Preference OR Practice)

**PROQUEST**

AB, TI("Breast Neoplasm” OR “Breast Neoplasm” OR “Breast Tumors” OR “Breast Tumor” OR “Breast Cancer” OR “Mammary Cancer” OR “Mammary Cancers” OR “Malignant Neoplasm of Breast” OR “Breast Malignant Neoplasm” OR “Breast Malignant