



Knowledge, Beliefs, and Attitudes About Breast Cancer Screening in Latin America and the Caribbean: An In-Depth Narrative Review

abstract

Purpose Breast cancer (BCA) is the most common cancer and leading cause of cancer mortality among women in Latin America and the Caribbean (LAC), and the number of deaths from BCA is expected to continue to increase. Although barriers to care include the physical accessibility of screening resources, personal and cultural barriers must be explored to understand necessary next steps to increase access to preventive care. The purpose of this in-depth narrative literature review was to explore empiric literature that surrounds the knowledge, attitudes, and beliefs toward BCA screening practices among women in LAC. To our knowledge, this is the first literature review to include articles from all countries and national languages (Portuguese, English, and Spanish) that pertain to this topic.

Methods OVID Medline, CINAHL, and Web of Science/SciELO were used to identify articles. Thirty-five articles were included according to inclusion and exclusion criteria.

Results Themes identified in the literature included knowledge about screening procedures and cause of cancer; knowledge sources; catalysts and deterrents for screening, such as family support, family history; social support or taboo, fear, self-neglect, cost, and transportation; and the perception of the screening experience.

Conclusion In addition to physical availability of resources and health care personnel, there is a necessity for culturally competent community educational interventions across all aspects of BCA screening and prevention. In light of the barriers to preventive health care, providers such as nurses and community health workers are uniquely qualified to provide culturally appropriate and individualized health education to address cultural and psychological barriers to BCA screening.

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INTRODUCTION

Breast cancer (BCA) is the most common cancer and leading cause of cancer mortality among women in Latin America and the Caribbean (LAC),¹ and the number of deaths from BCA is expected to continue to increase.² Despite who screening recommendations that outline the need for mammography and clinical breast examination (CBE) every 2 years for women age 50 to 69 years,³ women in low- and middle-income countries may not be able to comply with recommendations because of limited availability of preventive services.^{2,4}

Barriers to care are not limited solely to physical accessibility of screening resources; personal and cultural barriers must be explored to take

necessary next steps to provide preventive care to women in LAC. The purpose of this in-depth narrative literature review was to describe empiric literature about the knowledge, attitudes, and beliefs toward BCA screening among women in LAC. To our knowledge, this is the first literature review on this topic to include articles from all countries and national languages (Portuguese, English, and Spanish).

METHODS

Search Strategy and Selection Criteria

OVID Medline, CINAHL, and Web of Science/SciELO were searched in March 2017. Searches were conducted using individual and combined keywords and subject headings. MeSH terms

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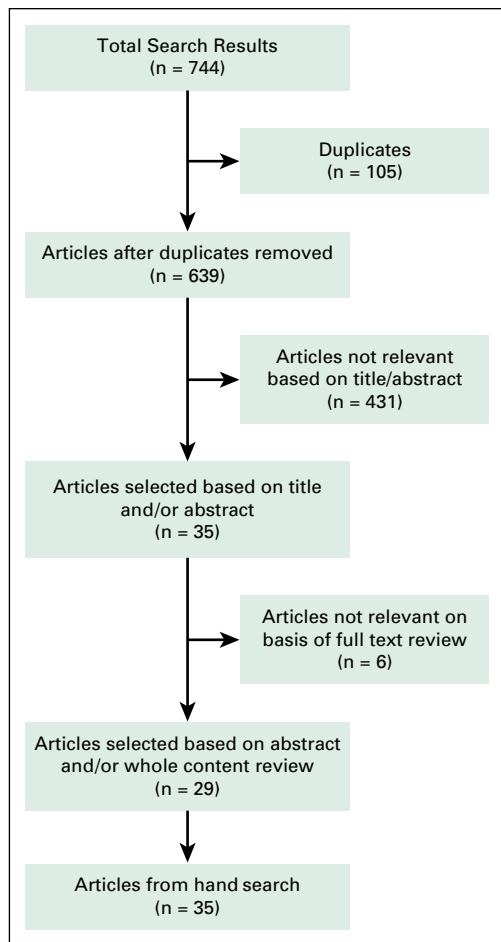


Fig 1. Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) diagram of the literature search strategy, including hand search, resulting in 35 reviewed articles.

were used in PubMed. SciELO was searched using keywords only. MeSH terms used were BCA, breast neoplasms, breast, cancer, cancer screening, Latin America, Latin, America, Central America, Central, America, South America, South, America, Caribbean, Islands, West Indies, West, and Indies. Individual names of each LAC country were also included in the search. References from key articles were hand-searched to ensure inclusion of pertinent studies. Studies were reviewed in the original language in which they were published.

Included article types were limited to peer-reviewed scholarly articles. Articles were excluded if the study was located outside LAC, including US territories; was unrelated to BCA only; was not original research, including reviews, conference posters or presentations, and best-practice guidelines; involved men, health science students or professionals, epidemiologic studies, or genetic screening; was not published in Spanish, English, or Portuguese; or was not specifically

related to knowledge, beliefs, and attitudes. This search had no date limits.

RESULTS

The initial search retrieved 744 citations; 105 duplicates were removed. Then, 639 citations were reviewed by title and abstract by the two principal authors and the librarian using the criteria listed in the Methods section. Overall, 431 citations were excluded. The full texts of the remaining 208 articles were reviewed by the principal authors, which resulted in 35 articles in the final analysis after whole-text review and hand search (Fig 1). Article inclusion and exclusion were reviewed independently by two authors (A.L.D. and E.M.M.) for consistency. Of the 35 articles⁵⁻³⁹ included for review (Table 1), references to each screening type varied: breast self-examination (BSE; n = 19), CBE (n = 9), and mammography (n = 22; Fig 2). There were 19, 11, and five articles in English, Portuguese, and Spanish, respectively (Fig 3). In cases when an article addressed more than one screening modality, that article is represented more than once.

Breast Health Knowledge

The reviewed articles revealed the range of women's knowledge about BCA and prevention, including the finding that knowledge seems to be related to the degree to which screening and diagnosis are delayed.²⁰ A study found that Nicaraguan women who were more knowledgeable about breast health were significantly more likely to have a CBE¹²; in Mexico, most women in one study reported having received vague information about BCA and were most knowledgeable about physical changes associated with its presentation.²⁶ Women in Brazil, when questioned about specific screening tests, revealed that approximately 77% were aware of at least one screening modality, but nearly 40% were not able to correctly name the examination, and approximately 20% were not aware of any examination.³¹

In Mexico, women were more knowledgeable about CBE and mammography guidelines than about BSE.¹⁰ In Trinidad, nearly 90% were aware of the need for regular mammography,¹⁶ though, in Brazil, only approximately half were aware of when screening should begin.³³ Education is a

Table 1. General Attributes and Findings of Included Articles

Author (year)					Findings	
	Country	Language	Screening Type	Study Design	Sample Size	Attitudes/Beliefs
Andrade et al (2005) ⁵	Brazil	Portuguese	BSE	Prospective, self-report	2,240	Participants with the highest social support scores had higher frequency of BSE.
da Silva et al (2011) ⁶	Brazil	Portuguese	BSE Mammography	Prospective, cross-sectional, exploratory, descriptive	18	All reported having heard of BSE, and 88.88% performed it. Of these, 87.5% have done so since age 35 years; 75% performed at any time of the month, and 87.5% at least once a month. None performed all BSE steps correctly. All who had never heard of BSE and/or who did not practice BSE were age \geq 60 years and had a maximum of 8 years of education; 94.44% had already heard of mammography, 50% had already done the exam, and 66.66% were age \geq 40 years when performed. Among the nine patients who had already had a mammogram, 88.88% performed after age 35 years and at least once a year (66.66%).
Banegas et al (2012) ⁷	Chile	English	Mammography	Survey	265	High-risk women more likely than average-risk to perceive themselves at higher risk; 67% overestimated their risk, although participants achieved higher accuracy with comparative risk (40%) and absolute risk (31.6%) methods.

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Table 1. General Attributes and Findings of Included Articles (Continued)

Author (year)	Country	Language	Screening Type	Study Design	Sample Size	Findings	
						Knowledge	Attitudes/Beliefs
Marinho et al (2008) ⁸	Brazil	English	Mammography	Descriptive observational	663	Health centers were the main instrument to promote mammogram knowledge (56.0%). Users of local health services had no adequate knowledge and practice related to SMMG despite having an adequate attitude about this exam. No association between sociodemographic variables and knowledge.	Overall, 7.4% had adequate knowledge about mammograms; 97.1% showed a positive attitude toward mammograms. The main barrier was lack of physician referral (81.8%). There was an association between attitude toward mammography and \geq 5 years of education and being married.
Castillo et al (2016) ⁹	Colombia	Spanish	BSE	Descriptive	779	Overall, 73% knew how to perform a BSE. Ages 30-49 years were most knowledgeable about how to perform BSE. In the rural study area, although the women received information about the technique of BSE, they did not perform it properly.	A total of 68% believed every woman should perform BSE.
Cruz-Castillo et al (2015) ¹⁰	Mexico	English	BSE CBE Mammography	Nested case-control	200	More than 50% knew the guidelines for CBE and mammography, but less than half knew the guidelines for BSE. Women with greater knowledge of the BSE guidelines were three times as likely to practice BSE as those with poor knowledge of the guidelines.	Positive perception of the quality of care, such as having competent clinic personnel, sufficient screening equipment, and reasonable waiting times to receive screening and to receive the results, increased the use of CBE by 40% and the use of mammography by 30%.

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Table 1. General Attributes and Findings of Included Articles (Continued)

Author (year)	Country	Language	Screening Type	Study Design	Sample Size	Knowledge	Attitudes/Beliefs
Delpech and Haynes-Smith (2015) ¹¹	Grenada	English	BSE	Descriptive, cross-sectional	110		Younger women were motivated to perform BSE, and divorced/separated/widowed women felt more susceptible to BCA but perceived fewer benefits in performing BSE. Women who did not attend church were more motivated and saw greater benefit in BSE. Frequent church attendees perceived themselves to be more susceptible, were less confident, and saw less benefit in BSE. Health-motivated women tended to be more confident and perceived more benefit in BSE. Women who perceived themselves to be more susceptible to BCA lacked confidence and perceived less benefit in BSE, whereas those who perceived BCA to be a serious disease also lacked confidence in BSE and perceived barriers to performing it.
Duda and Bhushan (2011) ¹²	Nicaragua	English	BSE CBE	Descriptive, survey based	198	Family history of BCA was associated with performing BSE. CBE was a significant determinant of pre-existing breast health knowledge; 74% had knowledge of BCA.	Participants expressed an interest in learning how to perform an SBE; 97.4% were comfortable performing BSE; 94% agreed to perform it monthly, and 77.2% had taught a friend or family member the technique before the 2-week follow-up assessment. A total of 52.8% felt they had no BCA risk.

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Table 1. General Attributes and Findings of Included Articles (Continued)

Author (year)	Country	Language	Screening Type	Study Design	Sample Size	Findings	
						Knowledge	Attitudes/Beliefs
Freitas Jr et al (2006) ¹³	Brazil	Portuguese	BSE	Descriptive, structured interview	2,073	A total of 75% knew about BSE. Knowledge was 4.2 times higher among housewives than women working away from home; 2.1 times higher among those aged 30 years or older; 2.1 times higher in those with 5 years or more of schooling, 1.98 times higher among those living in the greater Goiânia region, 1.4 times higher among those with ≥ two children, and 1.68 times higher among those with an income above two minimum wages.	
Gamarra et al (2009) ¹⁴	Argentina	English	BSE CBE	Cross-sectional	200	Link between emotional social support and BSE or CBE was not supported but may be due to the small sample size that tended to perform CBE and BSE.	
Godinho et al (2002) ¹⁵	Brazil	Portuguese	Mammography	Descriptive, exploratory	2,000		Overall, 15.65% considered mammograms unnecessary, and 0.55% did not do it because of lack of money. Screening for cancer was the main motivating cause (64.85%), followed by breast pain (16.05%) and preparation for surgery.

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Table 1. General Attributes and Findings of Included Articles (Continued)

Author (year)	Country	Language	Screening Type	Study Design	Sample Size	Knowledge	Attitudes/Beliefs
Gosein et al (2014) ¹⁶	Trinidad & Tobago	English	Mammography	Questionnaire- and focus group-based qualitative	314	<p>Women with higher education had greater knowledge of the benefits of early BCA detection and knew that an abnormal mammogram result or recall was not necessarily indicative of BCA; 70% of mammograms were primarily the doctor's decision; 64.6% agreed that a nonpalpable lump could be detected by mammogram; 89.8% agreed that mammograms should be performed at regular intervals; 43.6% knew mammograms might not always detect cancer; 46.2% knew BCA survival can be high when detected early; 76.8% knew family history was a risk factor. Obesity and alcohol were less well-known risk factors; 63.7% believed trauma to be a risk factor. Doctors (75.8%), television/radio (38.9%), magazines (28.7%), family/friends (28.3%), Internet (10.2%), and coworkers (9.2%) were sources of mammogram information. No association between education level and BSE. Overall, 17.5% wrongly indicated that breast compression increased risk; 34.1% did not know; 26.8% were unsure where mammography was available.</p>	<p>More than 90% of women were satisfied after a mammogram, most with plans for future use; 70% found the examination less painful than anticipated. About half were worried about pain or discomfort during the exam, 39.5% were concerned about radiation, and 62.4% were afraid of finding cancer. Overall, 48.4% disagreed, and 7.6% agreed, that transportation difficulties prevented them from having a mammogram; 8.6% agreed that time constraints were a barrier.</p>

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Table 1. General Attributes and Findings of Included Articles (Continued)

Author (year)	Country	Language	Screening Type	Study Design	Sample Size	Knowledge	Attitudes/Beliefs
Granado et al (2014) ¹⁷	Barbados	English	Mammography	Qualitative descriptive	110	<p>Women tend to borrow from available public health information on diabetes and HIV/AIDS to understand mammograms. Beliefs about cause of BCA included that everyone has a cancer cell, every lump is cancerous, radiation from the machine causes cancer, or because all breasts are lumpy, cancer cannot be detected until it is too late, the view that the machine causes BCA by squeezing the breasts and internal bleeding, or that falls or trauma can cause cancer. Women mentioned a range of sources of BCA information, from personal relationships with friends, colleagues or family members who have had personal experience to health organizations, the Internet, the media, and health professionals. Although women referred to the private sector for mammograms because of public sector equipment failure are entitled to receive this service at a subsidized cost, they did not appear to be aware of this.</p>	<p>Fear of mammograms and BCA diagnosis included expressed fear and impacts of social stigma, inability to afford prosthetics, and romantic relationships. Frustration with medical professionals (feeling rushed or had not received enough information). Attitudes of health professionals have a significant impact on health-seeking behavior. Most (except for age \geq 70 years) feared pain. Cost factors included lack of time to attend and cost of private services.</p>
Haikel et al (2012) ¹⁸	Brazil	English	Mammography	Descriptive	17,964		<p>Lack of screening adherence can be attributed to long distances to travel for access to facilities, unavailability of services, and low socioeconomic status.</p>

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Table 1. General Attributes and Findings of Included Articles (Continued)

Author (year)	Country	Language	Screening Type	Study Design	Sample Size	Knowledge	Attitudes/Beliefs
Hayes Constant et al (2014) ¹⁹	Peru	English	CBE	Qualitative	41	Common belief of trauma and incorrect healing, not having children, or breastfeeding causing BCA. Many believed all ages carried equal risk. Public health campaigns had helped spread awareness of BSE, either through presentations by clinical staff, at local clinics, or in community centers on television/radio; or directly from a provider.	Family as motivations for and limitations to health seeking. Many felt were sources of health information but also considered public care ineffective. First-hand experience of limitations inhibited future health-seeking intentions. Women expected that care would be too expensive. Women explained that they performed BSE when a sensation would worry them or remind them to perform BSE. were reluctant to share concerns out of fear that community members gossip. Level of fear expected to be reduced if CBE results were normal, making them more willing to encourage others to have CBE.

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Table 1. General Attributes and Findings of Included Articles (Continued)

Author (year)	Country	Language	Screening Type	Study Design	Sample Size	Findings	
						Knowledge	Attitudes/Beliefs
Kameo et al (2016) ²⁰	Brazil	English	BSE	Quantitative descriptive, exploratory	185	In the past 3 years, 80.5% reported having received information on BCA; 53% received information on BSE. Knowledge and awareness of women about BCA seem to be related to the delay in diagnosis and also in adherence to screening practices. Information was received from newspapers, magazines and television (51.2%), schools, associations, churches (16.5%), friends, colleagues and family (13%), "Unidade Saúde da Família" (9.4%), and other health services (5.1%). The majority (18%) reported that nonperformance of BSE can increase the chances of diagnosis, followed by use of chemicals (13%) and poor diet (12%); 53% received information on BSE, and 24.3% did not.	Among those who did not perform BSE, reasons were neglect to perform (24.9%), did not know how to do the exam (16.8%), had never heard of the test (3.2%), and were afraid to find a tumor (2.2%).
Kim et al (2010) ²¹	Brazil	Portuguese	BSE CBE Mammography	Cross-sectional	72	Participants had qualitative and quantitative improvement in their knowledge and good interaction with the researchers.	
Marchi et al (2010) ²²	Brazil	Portuguese	Mammography	Longitudinal, descriptive, comparative	460	Although more than 90% repeated mammograms at least once, the rate of correct compliance with mammograms two years was low (30%). Compliance related to unequal access to public or private health care services and previous screening.	

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Table 1. General Attributes and Findings of Included Articles (Continued)

Author (year)	Country	Language	Screening Type	Study Design	Sample Size	Knowledge	Attitudes/Beliefs
Modeste et al (1999) ²³	Trinidad & Tobago	English	BSE CBE Mammography	Descriptive	265	Overall, 30% did not know whether mammography was available on their island, 67% knew it was not; 92% had never attended a BCA awareness program. The most important information sources were television (63%), newspapers (46%), flyers from health centers (42%), radio (41%), nurses (22%), physicians (22%), friends (16%), and relatives (12%); 60% had been taught how to perform BSE, and 23% reported that a CBE was routinely included as part of their visit to a doctor.	The most important barriers to screening cited were unavailability of screening programs (66%), cost of screening (52%), and fear of cancer (48%). Other barriers were access to care (having to travel to Trinidad for mammography) (34%), time waiting for screening (22%), inconvenience (such as having to take time off work or arrange for child care) (15%), and that CBE was unpleasant (7%). Regardless of age, education, marital status, income, and occupation, the majority believed BCA could not be prevented.
Molina et al (2003) ²⁴	Brazil	Portuguese	BSE CBE Mammography	Cross-sectional	261	Overall, 80% received general orientations about BCA prevention, and 87% had specific orientations on BSE; 78.9% made the BSE, but only 27% made it correctly. Nine or more years of education was associated with better knowledge about the periodicity of BSE, CBE and mammogram.	If physicians requested a mammogram and it was available for all of them, 83.1% would like to have it.
Molina et al (2013) ²⁵	Chile	English	Mammography	Randomized clinical trial	250		Women who received a family recommendation were more likely to plan to get a mammogram because of increased perceived capabilities to do so.

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Table 1. General Attributes and Findings of Included Articles (Continued)

Author (year)	Country	Language	Screening Type	Study Design	Sample Size	Knowledge	Attitudes/Beliefs
Nigenda et al (2009) ²⁶	Mexico	Spanish	BSE	Qualitative, exploratory, cross-sectional	13	Majority reported having vague information about BCA before diagnosis. Sources of information included pamphlets, other women, magazines, knowledge of a BCA diagnosis of a family member or close person, school (adolescents) and one's mother. Almost all knew the purpose of BSE, but almost none knew the technique. Reasons for not seeking care: fear and other priorities in everyday life (caring for children, partner or family, or work). Women in urban areas and with more educational resources use the Internet. Women will follow physician instructions most of the time without questioning them because of trust, though at times, doctors reduced the importance (even for years) of abnormal findings.	Women delegate prevention practices to physicians. Other concerns are sexuality and the partner's body related to morphologic changes.
Brito et al (2010) ²⁷	Brazil	Portuguese	BSE	Prospective, cross-sectional	552	One third did not know about BSE. Of those who knew about BSE, 61% showed adequate knowledge and 59.5% adequate practice. Family history of BCA (8.9%) was not associated with better knowledge and practice. Media (63.6%) was found to be important in disseminating information about BSE. Women with > 5 years of education and with a partner were associated with a more correct BSE practice.	Of those who knew about BSE, 90% showed adequate attitude. Women older than 50 years had a better attitude toward BSE.

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Table 1. General Attributes and Findings of Included Articles (Continued)

Author (year)	Country	Language	Screening Type	Study Design	Sample Size	Knowledge	Attitudes/Beliefs
Pires Batiston et al (2011) ²⁸	Brazil	Portuguese	N/A	Cross-sectional	393	A total of 54.2% knew the risk factors for BCA. Factors associated with knowledge of risk factors were family history and educational level. In women aware of risk factors, 52.2% of them took preventive measures.	
Püschel et al (2011) ²⁹	Chile	English	Mammography	Mixed methods	48	Mammography was mentioned by less than a third as an effective form of breast care and cancer prevention. Breast trauma was perceived as a risk factor BCA and an incentive for having a mammogram. Physician support through medical advice was identified by most as an essential resource for having a mammogram. The advice of other health professionals (nurse, midwife), relatives or close friends was mentioned as a reference by only approximately one third of the participants.	<p>Detering factors: Most did not like to expose themselves to anyone to have a mammogram; belief that breast health was not something to share in a conversation with close friends, relatives or an unknown health care professional; laziness (flojera) and self-neglect; fatalism; referral to the disease as a programmed death; access problems, long waiting times, bureaucracy and transportation.</p> <p>Enabling factors: confidence in health care institutions, safety and dignity; feeling relief and the sense of having taken care of oneself after having a mammogram; receiving timely feedback.</p>

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Table 1. General Attributes and Findings of Included Articles (Continued)

Author (year)	Country	Language	Screening Type	Study Design	Sample Size	Knowledge	Findings	Attitudes/Beliefs
Salinas-Martinez et al (2017) ³⁰	Mexico	English	Mammography	Cross-sectional	1,045		Self-efficacy demonstrated the highest effect on repeat use, followed by awareness context-dependency, Papanicolaou test, fulfillment of expected waiting time outcome, and context-dependency related to self-referral/health provider referral, independent of risk perception, age, education, and positive emotional state of mind. Factors with the greatest association with repeat mammogram were learning that a known person has breast cancer and physician referral; there was an inverse relationship between mobile mammogram and repeat use. Overall fulfillment of expected outcomes increased the possibility of repeat use by 4.1 times.	

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Table 1. General Attributes and Findings of Included Articles (Continued)

Author (year)	Country	Language	Screening Type	Study Design	Sample Size	Knowledge	Attitudes/Beliefs
Santos et al (2011) ³¹	Brazil	Portuguese	Mammography	Cross-sectional, exploratory	98	A total of 22.4% did not know any exam, 77.6% knew some exam, and 38.8% were not able to say the correct name of the exam. The subject of BCA is well known to women; 43.4% reported having difficulties, and 56.6% did not.	Reasons most frequently cited for having a mammogram were concern with health (53.8%) and medical recommendation (38.5%). Reasons for not having a mammogram were no medical recommendation (50%), conviction that they will never have the illness (23.1%), didn't feel symptoms (19.2%), and fear (7.7%). Cited difficulties were as follows: found the examination painful (27.6%); delay to schedule the exam (10.2%); feeling ashamed (7.1%); delay to take the exam (5.1%); fear of the exam (5.1%); poor attendance at the time of the exam (2%); and fear of finding cancer (2%).
Schneider et al (2013) ³²	Brazil	Portuguese	Mammography	Secondary analysis of two population studies	957		For women who never performed the exam, the majority were due to lack of application (51.2%; 80% were between 40 and 49 years old) followed by fear or embarrassment of the exam (30.2%).
Silva et al (2013) ³³	Brazil	English	BSE CBE Mammography	Mixed methods	206	Difficulty in accessing mammography was most frequently due to lack of knowledge about mammograms in asymptomatic women; 56.3% were able to answer that a woman should start mammography at age 40 years.	A total of 39.5% did not have a mammogram because of negligence and/or laziness, and 12% for fear of the disease; 5.6% reported practical barriers, such as difficulty in obtaining access to mammography and fear of the disease.

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Table 1. General Attributes and Findings of Included Articles (Continued)

Author (year)	Country	Language	Screening Type	Study Design	Sample Size	Knowledge	Attitudes/Beliefs
Soares et al (2009) ³⁴	Jamaica	English	Mammography	Interview	274	Significant association between being late for a mammogram and the perception that a doctor's referral was necessary.	Major determinants of having a mammogram were the expectation that the procedure would be painful and the pain intensity experienced during a mammogram. Factors associated with improved mammogram experience were pain intensity, interval status of previous mammogram and knowing someone with BCA. Although 97% of all women found mammogram painful, only 2.5% said pain would prevent a repeat mammogram. Fear, pain during a mammogram, subjective indifference, and reliance on physician referrals were identified as barriers to complying with mammogram screening guidelines.
ToroRubio et al (2014) ³⁵	Colombia	Spanish	BSE	Descriptive, cross-sectional		Overall, 33.8% reported knowing about the BSE; 95.7% agreed that it was important. Sources of information were health care professionals (83.6%) and the Internet (1%). Those who did not perform BSE reported not knowing or forgetting (32%), fear (4.6%), not knowing it was necessary (5.2%), and disinterest (2%).	

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Table 1. General Attributes and Findings of Included Articles (Continued)

Author (year)	Country	Language	Screening Type	Study Design	Sample Size	Findings	
						Knowledge	Attitudes/Beliefs
Villacrés Vela and Alarcón-Rozas (2002) ³⁶	Brazil	Spanish	BSE Mammography	Descriptive, cross-sectional	100	A total of 57% never have done a BSE, 56% know the utility of BSE, an 43% know the technique, but only 8% practice the BSE with the adequate frequency. More than half never had a BSE, and despite 56% who knew the utility of the BSE, only 8% performed it; only 7% of women older than age 40 years had an annual mammogram because of the lack of machines in Sullana.	
Wall et al (2008) ³⁷	Mexico	English	BSE CBE Mammography	Case-control	330	Knowledge about BSE utility was greatly associated with use of screening services.	Perceptions about structural and organizational barriers strongly associated with BCA screening.
Wood et al (2013) ³⁸	Chile	English	Mammography	Cross-sectional	103	Screening barriers were as follows: cost (35%), self-neglect (fijera) (12%), time (11%), pain (8%), transportation (6%), fear (5%), and embarrassment (1%). The number of perceived barriers was significantly lower for compliant women. Women who reported having a conversation with a doctor about mammography reported fewer barriers and were more compliant than those women who had not discussed screening with a physician.	
Yépez-Ramírez et al (2012) ³⁹	Mexico	Spanish	BSE	Descriptive, cross-sectional	350	Most women performed BSE for prevention (91.8%). Sources of knowledge were nurses (76.5%); physicians (6.5%); social workers (4.8%); and media, such as television, radio, and newspaper (6.8%). Reasons for nonperformance were fear (4.3%), fijera (50%), forgetfulness (6.5%), lack of knowledge (28.2%), and disinterest (10.8%).	

Abbreviations: BCA, breast cancer; BSE, breast self-examination; CBE, clinical breast examination; SMMMG, screening mammography.

known factor in BCA and screening knowledge: studies from Trinidad¹⁶ and Brazil²⁴ note associations between education and BCA detection knowledge.

Family History and Cause of Breast Cancer

There is inconsistent evidence about the relationship between family history (FH) and BCA or BSE knowledge. Women in Nicaragua and Brazil with positive FH tended to be more aware of BCA risk factors²⁸ and to perform BSE.¹² More than three quarters of Trinidadian women knew that FH is a risk factor for BCA.¹⁶ However, according to one article from Brazil, this knowledge was not always associated with BSE knowledge or practice.²⁷ Although research in Nicaragua pointed to a positive association between FH and BSE, more than half of women studied believed they did not have a personal BCA risk,¹² although the converse was found in a study from Chile, where participants overestimated their risks.⁷

Several studies reported a misperception that trauma causes BCA, from compression of the breast, possibly from the mammogram machine^{16,17} or radiation from mammography¹⁷; to physical trauma, such as blows to the chest that cause injury and produce internal bleeding or incorrect healing that leads to cancer.^{17,19,29} Those who believed compression was a risk factor tended to be women with the least education.¹⁶ However, this belief was a motivating factor for some to have mammograms.²⁹ Other misperceptions were that not having children or breastfeeding were BCA causes and that age did not increase BCA risk.¹⁹ Only 30% of 314 Trinidadian women studied were aware of obesity as a risk factor, and only 12% knew that alcohol consumption increased risk.¹⁶

Attitudes Toward Cancer Screening

Regarding attitudes toward mammography, one study⁸ showed a 97% positive attitude among Brazilian women. Several articles from Brazil show ranges of knowledge, from 7.4% with adequate general knowledge⁸ to 94% who have heard of mammography.⁶ Seventy-eight percent from another study did not agree that one needs a mammogram instead of a CBE,²⁰ and 16% considered mammography unnecessary.²³ A major reason for nonperformance in 38% of a Brazilian sample was lack of knowledge of its

use to detect asymptomatic cancer.³³ Less than one third of Chilean women viewed mammography as effective for prevention²⁹; in Trinidad, although nearly 65% knew mammography could detect nonpalpable masses, less than 50% knew that mammograms were not always capable of detecting cancer.¹⁶

A sample of Peruvian women had positive attitudes toward the importance of CBE as an issue in their communities.¹⁹ For all examinations, in Mexico and Chile, studies showed that the perception of the clinical experience (competent staff, being treated with dignity, having correct equipment, reasonable waiting times in clinic and until receiving results) was an important factor for use of services.^{10,29} In Barbados, some women felt frustration with their clinic experience, because they felt they were not provided enough time or information to make informed decisions.¹⁷

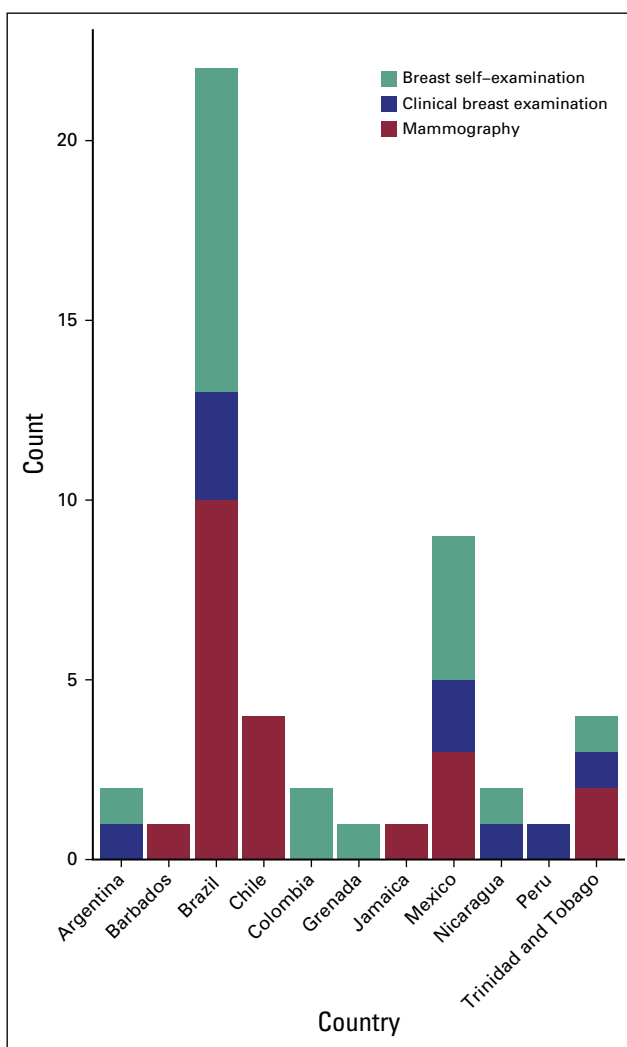
Facilitators for Care-Seeking Behavior

In addition to positive attitudes about clinic experiences, other factors that encourage care-seeking behavior include the perception of available care: in one study, more than 80% of Brazilian women reported wanting a mammogram if it was available.²⁴ Despite findings of inadequate mammography knowledge and belief that it was unnecessary, cancer screening was nevertheless the main motivation in 65% of Brazilian women who had mammograms, followed by 16% for existing breast pain.¹⁵ Similarly, more than half of Brazilian women interviewed in one study had mammograms because of existing health concerns, though nearly 40% reported that they would have it if recommended by a physician. However, half cited lack of medical recommendation as a reason for nonperformance, followed by the belief that they would not develop BCA (23%) and lack of symptoms (19%).³¹

Sources of Knowledge

Relationships and conversations with friends,^{16,17,20,23,29} family,^{16,17,20,23,29} and coworkers^{16,17,20} were important information sources about BCA and screening. In Barbados¹⁷ and Mexico,²⁶ these sources were family members or others with whom women had close relationships and who had had firsthand BCA experiences. Moreover, studies from Jamaica³⁴ and Mexico³⁰

Fig 2. Distribution of screening type by country. Articles and countries are represented more than once in cases when more than one screening type is mentioned.



showed that knowing someone who has had BCA improved the mammography experience³⁴ and encouraged repeat mammography.³⁰

In Mexico,^{26,39} Peru,¹⁹ Brazil,²⁰ Trinidad and Tobago,^{16,23} and Barbados,¹⁷ media, including newspapers, television, and radio, was an important information source. For women in Mexico,²⁶ Trinidad¹⁶ and Barbados,¹⁷ especially for educated women in urban areas, the Internet was also used.²⁶ However, in one study, only 1% of Colombian women used it to obtain BCA information.³⁵ Other sources included flyers from health centers,^{23,26} schools,^{20,26} and churches.²⁰ In one study, barriers seemed much higher: in Barbados, information about mammography was so scarce that women instead turned to resources about other, more popular, diseases, such as diabetes and HIV/AIDS.¹⁷

The degree to which women reported physicians and other health care workers as knowledge

sources varied between articles and countries. More than 75% of Trinidadian women¹⁶ and more than half in one study from Brazil,⁸ 84% of women in Colombia,³⁵ and 76.5% of women in Mexico³⁹ reported these groups as knowledge sources, but nurses and physicians were referenced by only 22% of Tobagonian women and were not their most important source.²³ Similarly, in Chile, only approximately one third from one study used nurses and midwives as important information sources; physician advice was a more important resource,²⁹ and women who discussed mammography with physicians and were adherent to screening guidelines were less likely to report access barriers.³⁸ Articles from Barbados¹⁷ and Peru¹⁹ also cited physicians and other health services to an unspecified degree as reliable sources.

Family was mentioned as an important influence on mammography performance in two articles.

Fig 3. Distribution of article origins by country.



Chilean women whose families recommended mammography had a greater sense of self-efficacy to have one,²⁵ a factor that also encouraged repeat mammography in Mexico.³⁰ Although some Peruvian women viewed family support as a positive influence in the tendency to seek care, family also had the capacity to limit this behavior: consideration of one's family (eg, desire to be able to care for children) was a limiting factor for some Peruvian women.¹⁹

One article from Argentina did not find any link between social support and BSE or CBE performance, but the study sample may have been too small to observe an effect. One article from Brazil, however, found that women who had greater social support were significantly more likely to perform BSE.⁵

Articles from Peru,¹⁹ Barbados,¹⁷ Colombia,³⁵ Jamaica,³⁴ Mexico,^{26,39} and Chile²⁹ showed that women fear stigma from the community from the standpoint of sacrificed personal privacy or taboo associated with the disease. In

addition to the desire to withhold details from friends or family, Chilean women in one study would only discuss breast health with health professionals with whom they were familiar.²⁹ Some Barbadian and Mexican women feared negative consequences of BCA diagnosis or the effects of surgery on intimate relationships with a partner, especially in the absence of financial capacity for reconstructive surgery or prosthetics.^{17,26}

Deterrents of Care-Seeking Behavior

Fear. Fear of finding disease or embarrassment from the exam was also an important factor in Brazil³¹⁻³³ and, to a lesser extent, in Chile.³⁸ Articles from Trinidad and Tobago also noted that fear of finding cancer discouraged screening.^{16,23} However, Peruvian women reported that, if their CBE had negative findings, their sense of fear and willingness to discuss breast health would improve, as would their willingness to urge others to have the examination.¹⁹

Self-neglect and fatalism. Articles from Chile^{29,38} and Mexico cited the term *flojera*—self-neglect from laziness or limited time—as a reason for nonperformance. In Brazil, women similarly referred to negligence or laziness as a reason given by nearly half in one study for mammography nonperformance.³³ Women in Mexico and Brazil cited forgetfulness^{35,39} and disinterest³⁹ as additional reasons for nonperformance. A study from Mexico noted other obligations, such as work and family, that led to decreased time for screening adherence.²⁶

Another cultural barrier is fatalistic attitude toward the ability to prevent BCA occurrence or mortality. In Tobago, this was the case for many women, regardless of other socioeconomic determinants.²³ In Chile, although a fatalistic attitude was more common in noncompliant women, approximately half of compliant women also shared this quality.²⁹ Chilean women who had previously had BCA viewed the disease as a programmed death.²⁹ Opinions of BCA among Barbadian women were that cancer cannot be found until it is too late, that any lump is cancerous, and that every person has a cancer cell.²⁹

Physical barriers and availability of technology.

In most cases that mentioned financial barriers, cost was prohibitive to access; these included accounts from Peru,¹⁹ Chile,³⁸ Barbados,¹⁷ and Tobago.²³ In Barbados, although subsidized mammography is available to women within the public sector, many were not aware and instead deferred to a private service.¹⁷ Similarly, approximately one third of Tobagonian women were not aware that there was no mammography facility on their home island.²³ In only one article, from Brazil,¹⁵ the majority of women did not reference cost of screening as prohibitive.

In addition to monetary cost, time required played an important role, including the opportunity cost of taking time to attend a clinic.^{17,23,29,30,38} Articles from Brazil¹⁸ and Chile²⁹ noted transportation or long travel distances as important barriers. Women from Trinidad reported this difficulty, and approximately one third of interviewed women on Tobago, who must travel to Trinidad for mammography, saw transportation as a major limitation.^{16,23} In some cases, perceptions of organizational barriers alone were enough to deter screening.³⁷ Time and transportation, however, were not always problematic: Although cost made screening difficult, these

were not important limitations for women in Trinidad¹⁶ and Chile.³⁸

Additional resource-related barriers, such as lack of physician referral for mammography in Brazil, were reported in several articles.⁸ General lack of resource availability was also attributed by women in Brazil²² and Peru¹⁹ to differences between public and private systems, where women were striving to afford private services because of the perception of their superiority.¹⁹ Peruvian women were also less likely to exhibit health-seeking behavior if they had had difficulties previously.¹⁹ Barbadian women reported that whether they saw physicians through public versus private systems was greatly related to their perceptions of physicians.¹⁷

Perception of the Screening Experience

Before a first mammography, fear of pain or discomfort was a major deterrent in Trinidad,¹⁶ Barbados,¹⁷ Jamaica,³⁴ and Chile³⁸; in addition, 40% of women were concerned about radiation.¹⁶ However, only 2.5% of the 97% in Jamaica who experienced pain during mammography thought this would be a reason not to return.⁴⁰ More than 90% of women in Trinidad were willing to repeat mammography, and 70% reported less pain than they had expected.¹⁶ Similarly, only 7% of Tobagonian women felt that CBE was unpleasant.²³ After mammography, approximately half of Chilean women felt a sense of relief and reward for having taken care of themselves.²⁹ One article found that, when women in Mexico were satisfied with the screening experience, the tendency to return for repeat screening quadrupled.³⁰

In addition to the screening experience as a reason to undergo mammography, women will defer detection to the physicians and follow instructions as a result of trust in their doctors. However, many reported that physicians minimized the importance of a clinical finding, sometimes even for years.²⁶

Breast Self-Examination

BSE, although no longer a recommended practice,⁴¹ is second only to mammography in the number of articles that addressed women's knowledge, attitudes, and beliefs about BCA screening. In Brazil, although 90% of one study population had good attitudes about BSE²⁷

and approximately 80% in two Brazilian studies received information about BCA,^{20,24} the literature review showed a range of general BSE knowledge, from approximately 50% to 87% who had some knowledge about the exam and reasons for performance.^{13,20,24,27,36} The range in Brazilian women's ability to perform BSE ranged from no women able to perform all steps correctly despite knowing about the practice in one study⁶ to 27% who could perform it in another study.²⁴

In addition to studies from Brazil, studies from Colombia, Grenada, Mexico, Nicaragua, and Tobago were reviewed about BSE.^{9-12,23,26} Articles from Colombia found that between 34% and 73% of women knew how to perform BSE and that 68% to 96% believed that BSE should be performed by all women.^{9,35} In Tobago, 60% of the study population had received education on BSE technique, but only approximately 40% regularly performed it. In Peru, some performed BSE only when they experienced an abnormal sensation in the breast.¹⁹ Similarly, in Mexico, although most women who were asked were aware of the purpose of a BSE, most did not know the proper technique because of insufficient information.^{26,39}

Findings among articles reviewed were not consistent about age and women's attitude toward and tendency to perform BSE: One study found that younger women in Grenada tended to be more motivated to perform BSE¹¹; in Brazil and Mexico, though, older women were more likely to know about and practice BSE.^{10,13,27} This is contrary to other findings from Brazil that older women tended not to know about or adhere to CBE.⁶

Although one article found that some received information about BCA screening from church in Brazil, church in Grenada could be a deterrent of women's sense of necessity to perform BSE. However, these women also perceived themselves as more susceptible to BCA, which caused increased perceived barriers to performance.¹¹ Like the common findings of shame and desire for privacy in articles about CBE and mammography, a sample of Chilean women also identified BSE as a way to maintain privacy for themselves.²⁹ Two articles^{13,27} found that Brazilian women who had more than 4 years of education were more likely to know about and perform BSE; conversely, in Trinidad, there was

no apparent relationship.¹⁶ Other sociocultural factors that positively influenced BSE knowledge and performance included living in a city center versus a rural area,^{9,13} having a partner or children,^{13,27} or being a housewife.¹³ As with mammography and CBE, self-neglect was a barrier to performance of BSE.²⁰

Two articles assessed the impacts of educational interventions on women's knowledge about BCA screening. In Nicaragua, authors conducted a training program in the performance of BSE, and results from the program indicated that a majority of women were positive about BSE, were confident in their abilities, and later taught another community member how to perform BSE.¹² In Brazil, through an educational intervention, participants had good improvement in BCA and screening knowledge.²¹

DISCUSSION

This review reveals a diverse picture of the barriers to BCA screening in LAC. Not only are there frequent knowledge gaps about BCA and screening types, but also the reasons for not wishing to attend a clinic or to be screened—including fear, fatalism, and self-neglect as well as the anticipation of discomfort during mammography or CBE—are important factors. Many communities reported difficulty in obtaining services (logistics, time, and cost), and BCA mortality may not subside without proper culturally appropriate education and motivation for seeking care. This education should take into account reported knowledge sources and commonly reported motivations for seeking care.

According to the findings from this review, programs to improve available resources for BCA in LAC will not be sufficient to increase screening and improve outcomes if used alone. In addition to the need for physical availability of resources and health care personnel, there is a need for culturally competent community education about all aspects of BCA screening and prevention, a sentiment supported by many of the articles in this review^{6,8,11,12,15-17,20,23,27,30-32,36,38}; for example, there is a potential benefit of pairing screenings for breast and cervical cancer within the same clinic visit.²⁶ Several articles^{10,16,25,29,33} noted the necessity for providers and health centers to offer information related to cancer prevention and to do so in culturally appropriate ways, using providers such as nurses to

tailor education strategies to the community and individual.¹⁴

All databases available at the authors' institutions were used for this review. This included OVID Medline, SciELO, PubMed, and CINAHL, but the EMBASE database was not an available subscription for this review. In addition, the presence of only one Portuguese speaker on the research team limited the ability of the authors to verify article inclusion and exclusion criteria past the abstract (often translated to English), as was done for articles in Spanish and English. Therefore, this limitation may have introduced bias to the article selection procedure for these articles.

Because this was not a traditional systematic review and because of the volume of citations taken from the initial search results, the professional judgment of the authors was used in lieu of a formal checklist (eg, Preferred Reporting Items for Systematic Reviews and Meta-Analyses [PRISMA]). Though a more in-depth systematic review is warranted in the future, this study elucidates a topic that, to our knowledge, has not been addressed to this point and provides an

opportunity to introduce this important topic to the scientific literature.

With regard to limitations within the research articles themselves, there appears to be a need for distinctions to be made between rural and urban communities in some countries, because this has the potential to affect women's attitudes toward screening and physical access. Such distinctions should be addressed in additional research on this topic.

This literature review is, to our knowledge, the first about the knowledge, beliefs, and attitudes of BCA screening practices in LAC that includes articles in Spanish, English, and Portuguese. Of the included articles, nearly half of the information on this topic could have been neglected because of language restrictions that are commonly practiced in literature reviews. In light of the barriers to preventive health care, providers such as nurses and community health workers are uniquely qualified to provide culturally appropriate health education.

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