

Table SI.

First author, year	Study details	Selection process	Data collection	Screening adherence	Barriers studied	Main outcomes	Refs.
Adu <i>et al</i> , 2015	<p>Design: Cross-sectional Country: Canada Target population: Immigrant women</p> <p>Number of participants: 1,625</p> <p>Age range: 50-69 years Study aim: To examine the association between recency of immigration and MAM uptake.</p> <p>Inclusion criteria: Immigrant women; aged 50-69 years; valid responses to immigrant status and MAM uptake.</p> <p>Exclusion criteria: Invalid responses for the potential confounding variables of age, total household income, education, knowledge of official language and race.</p>	<p>Participants were recruited through the 2011-2012 CCHS, a national representative cross-sectional survey conducted by Statistics Canada.</p>	<p>Data was extracted from the 2011-2012 CCHS. The survey collects data on health status, determinants of health, health behaviours and health services utilization of Canadians aged 12 years and older who live in privately occupied dwellings in the ten provinces and three territories of Canada.</p>	<p>56.1% (recent uptake; recent immigration)</p>	<p>Recency of immigration</p>	<p>Ever having a MAM and recency of immigration. (OR=2.96, 95% CI: 1.20-7.32).</p>	(18)
Cohen <i>et al</i> , 2016	<p>Design: Qualitative Country: Kentucky, USA Target population: Appalachian Kentucky Women</p> <p>Number of participants: 27</p> <p>Age range: 41-70 years Study aim: To determine what specific sociocultural barriers women residing in Appalachian Kentucky report to maintaining compliance with the</p>	<p>Assessment of interest of women in their communities with the assistance of the Community Advisory Board. The interested women were then contacted by phone by the research coordinator.</p>	<p>Semi-structured interview</p>	<p>26% (MAM in the last year)</p>	<p>Pain and embarrassment. Impersonal and unprofessional MAM experience. Fear of detection compounded by poor provider communication</p>	(32)	

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	recommended MAM screening protocol, and whether there are communication practices that may help women surmount these barriers Inclusion criteria: Women, resident of eight underserved Appalachian Kentucky counties, aged >40 years, who had experienced at least one screening MAM. Exclusion criteria: History of breast pathology (including breast cancer) with the exception of postpartum mastitis.				Factors associated with no screening adherence: Primary school only: $AOR=1.98$ (95% CI: 1.58-2.05); receiving government aid: $AOR=2.27$ (95% CI: 1.14-4.52); having a medical consultation in the past year: $AOR=0.16$ (95% CI 0.05-0.46); having been visited by a health agent: $AOR=0.43$ (95% CI: 0.22-0.85)	Age, marital status, education, insurance, household income, cohabitating family members (n), government aid, medical consultation in the past year, health agent visit	(19)
De Andrade Souza <i>et al,</i> 2017	Design: Cross-sectional Country: Boa Vista, Roraima, Legal Amazon, Brazil Target population: Amazonian women Number of participants: 241 Age range: 40-69 years Study aim: To assess the prevalence of the use of mammographic screening and the factors related to non-adherence in Boa Vista, the capital of the state of Roraima, in the Brazilian Amazon area. Inclusion criteria: Women aged 40-69 years resident in the municipality of Boa Vista for at least two years.	The sample size was calculated, and the city blocks were listed and randomized. Female residents belonging to the target age group were approached in their homes and invited to participate.	Semi-structured form answered via face-to-face interview	At one point in their lifetime: 61.4%; Within the past 2 years: 44.4%			

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Farzaneh <i>et al</i> , 2017	<p>Design: Cross-sectional Country: Iran Target population: Azeri females (living in Ardabil, northwest Iran)</p> <p>Number of participants: 1,134</p> <p>Age range: 20-60 years (40-60 years for MAM)</p> <p>Study aim: To assess BSE, CBE and MAM screening behaviours among Azeri females (living in Ardabil, northwest Iran) and to study associations among these screening behaviours with demographic and cognitive variables, such as self-efficacy, barriers, and attitudes toward breast and cancer screening.</p> <p>Inclusion criteria: Ardabilian female aged 20-60 years; no personal history of breast or cervical cancer; willingness to participate in the survey</p> <p>Exclusion criteria: Not consenting to complete the questionnaire; diagnosis of breast or cervical cancer.</p>	<p>Ardabil city was divided into three regions according to economic status. Participant were recruited in public places, such as coffee shops, retail stores, bookstores, childcare facilities, grocery stores, bus stops, and parks, were selected by simple random sampling from each region.</p>	<p>The data-collection instrument (questionnaire) comprised five sections: 1) Sociodemographic questions, 2) screening behaviour for breast cancer, 3) self-efficacy, 4) beliefs and 5) barriers to breast cancer prevention.</p>	<p>Once in their life: CBE: 9.8%; MAM: 29.9%; Regularly: CBE: 5.6%; MAM: 16.5%;</p>	<p>Marital status; health insurance; family income; literacy; beliefs in screening; self-perceived barriers; self-efficacy</p>	<p>High income: MAM (OR=8.7, 95% CI: 2.3-24.3); high belief in screening; Regular MAM (OR=4.2, 95% CI: 1.9-9.3), regular CBE (OR=1.25, 95% CI: 1.2-1.3; high self-perceived barriers; Regular MAM (OR=0.16, 95% CI: 0.04-0.6); CBE (OR=1.5, 95% CI: 1.3-1.7); high self-efficacy: Regular MAM (OR=2.56, 95% CI: 1.41-4.6)</p>	(23)

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First author, year	Study details	Selection process	Data collection	Screening adherence	Barriers studied	Main outcomes	Refs.
Freund <i>et al</i> 2019	Design: Cross-sectional Country: Israel Target population: Arab women and ultra-orthodox Jewish women. Number of participants: 799 Age range: 40-60 years Study aim: To assess breast-cancer screening adherence in relation to health beliefs and cultural barriers among Arab women (as a cultural-ethnic group) and ultra-orthodox Jewish women (as a faith-based group). Inclusion criteria: Age 40-74 years, not being previously diagnosed with cancer, and not being adherent with regard to all three examinations: MAM, CBE and Breast Awareness Practice. Exclusion criteria: Women without a sufficient literacy level to answer the questionnaire were excluded.	Arab participants were recruited by means of randomized sampling, from ten cities and villages in northern and central Israel. Ultra-orthodox women were randomly recruited from three cities with large ultra-orthodox populations in northern and central Israel.	The questionnaire applied to the participants addressed some questions about demographic details, history of breast cancer in the family and adherence to screening guidelines. Furthermore, it was also applied The Health Belief Questionnaire and the Culture-Based Health Beliefs.	22.3% (CBE-ultra-orthodox); 31.9% (CBE-Arab); 50.6% (MAM-ultra-orthodox); 72.7% (MAM-Arab)	Religious beliefs Social barriers Exposure barriers Accessibility barriers Perceived Severity Perceived risk CBE advantages CBE barriers MAM advantages MAM barriers	Religious beliefs: MAM (AOR=0.62, 95% CI: 0.39-0.82); perceiving a higher risk of cancer: CBE (AOR=1.93, 95% CI: 1.23-3.04); perceiving a higher risk of cancer: MAM (AOR=3.22, 95% CI: 1.53-6.61); having more fears related to cancer-related losses: CBE (AOR=1.51, 95% CI: 1.19-3.00); perceiving greater advantages of CBE (AOR=1.82, 95% CI: 1.45-2.29); receiving a physician's recommendation: MAM (OR=1.82, 95% CI: 1.45-2.29)	(26)
Guo <i>et al</i> , 2019	Design: Cross-sectional Country: USA Target population: African American women Number of participants: 3,911 Age range: 40-55 years Study aim: To analyse economic, social and	National databases	Secondary data analysis of African American participants in the Study of Women's Health Across the Nation (SWAN).	68.6% (CBE and MAM in the last 2 years)	Age; health condition (self-reported); quality of life (self-reported); employment status; marital status; education levels; family income; smoking; subscale of accessibility to healthcare provider available	Older age (OR=1.08); educational level (OR=1.11); smoked regularly (OR=0.66); having female healthcare providers (OR=3.23); no healthcare provider available (OR=0.71); patients do not trust the physicians (OR=0.44); did not have time to visit doctors	(20)

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First author, year	Study details	Selection process	Data collection	Screening adherence	Barriers studied	Main outcomes	Refs.
Hong <i>et al</i> , 2018	psychological factors associated with African American women's adherence to the recommended breast cancer screening guidelines during their mid-age period.	Design: Cross-sectional Country: Chicago, USA Target population: KA women Number of participants: 196 Age range: 50-74 years Study aim: To examine the factors contributing to breast cancer screening adherence among KA women. Inclusion criteria: 1) Age 50-74 years, 2) no history of cancer and 3) able to read and understand either Korean or English.	The participants were recruited from four Korean churches. The question related to breast cancer screening adherence was from recent USPSTF guidelines. Acculturation was measured with a Short Acculturation Scale for Koreans. Cultural beliefs were measured by the Cultural Beliefs Scale. Perceived discrimination in healthcare was measured by a modified version of Williams' Everyday Discrimination Scale. Trust in the healthcare system was measured by the revised Healthcare System Distrust scale.	54% (MAM in the last 2 years)	Having regular doctors or places for healthcare, trust in healthcare providers and system were significant predictors of being screened within the past 2 years. Perceived discrimination had an indirect effect on breast cancer screening through trust.	MAM: Having regular doctors OR=places for healthcare (OR=29.91; 95% CI: 3.75-238.13); trust in healthcare providers (OR=1.14; 95% CI: 1.01-1.29); distrust in healthcare system (OR=0.84; 95% CI: 0.72-0.99)	(27)
Lee <i>et al</i> , 2016	Design: Cross-sectional Country: Cook County, Illinois, USA Target population: First-generation KA women married to KA men. Number of participants: 428 KA couples Age range: >40 years	Invitation letters were sent to religious organizations in the Chicago Korean Business Directory. The organizations were then contacted by phone and the eligibility was assessed. The study	75% (screened at least once)	Age, level of acculturation, employment status, education level, annual household income, healthcare access (health insurance, regular healthcare provider, check-up in previous	Age: AOR=1.12 (95% CI: 1.07-1.16); regular access to healthcare (yes vs. no): AOR=2.44 (95% CI: 1.34-4.64); health beliefs and spousal support-seriousness: AOR=2.25 (95% CI: 1.40-3.63); barriers: AOR=0.17 (95% CI: 0.09-0.32); self-efficacy:	(25)	

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First author, year	Study details	Selection process	Data collection	Screening adherence	Barriers studied	Main outcomes	Refs.
Lee <i>et al</i> , 2017	<p>Study aim: Comparing groups of KA women who had had a MAM with women who had never had one using baseline cross-sectional data from the KIM-CHI trial.</p> <p>Inclusion criteria: Immigrant women aged 40 years or older, able to communicate in Korean, and married to a KA immigrant man who also could communicate in Korean.</p> <p>Exclusion criteria: Second-generation KA immigrants, women who had had a MAM within the previous year or who had been diagnosed with breast cancer.</p>	<p>participants were recruited from the eligible ones who chose to participate.</p> <p>Cluster sampling was used to randomly assign one program or the other.</p> <p>Participants were recruited at each organization after the religious organization leader announced the program during the service</p>	<p>MAM adherence and sociodemographic characteristics were assessed by self-report. The women also responded to questions on healthcare resources and utilization.</p> <p>Knowledge about breast cancer and screening was measured in both the women and their husbands.</p> <p>Items from Champion's scale measuring knowledge about breast cancer and MAM were also used. Five items measuring encouragement and support received or provided from husbands to wives were developed.</p>	<p>2 years) health beliefs (participant knowledge, husband knowledge, susceptibility, seriousness, benefits, barriers, self-efficacy), spousal support, participant perception of spousal support received, husband provided</p>	<p>AOR=3.07 (95% CI: 1.48-6.38); wives' perceived support received AOR=1.99 (95% CI: 1.14-3.48)</p>	<p>MAM: Age (OR=1.08), barriers to breast cancer screening (OR=0.87), education (OR=0.77), and knowledge of procedure (OR=105.47); CBE: Distrust of health professionals (OR=0.71), education (OR=0.82), knowledge of procedure (OR=28.77)</p>	(31)
					<p>Once in their life: CBE: 59%; MAM: 71%; In the last 2 years: CBE: 14.9%; MAM: 10.1%;</p> <p>This study employed a cross-sectional study design, using baseline data from a mobile phone application-based MAM intervention trial, 'mMAM.' The 168 participants completed the baseline survey through face-to-face interviews. Three</p>		

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Miller <i>et al</i> , 2018	future intervention strategies, using three breast cancer screening methods of MAM, CBE and BSE.	Recruitment at community-based organizations of Chinese Americans in NYC. Recruitment flyers were also posted in local Chinese newspapers, community centres, Chinatown libraries, grocery stores, churches, and on the Stony Brook University clinical trial message board.	Demographic and medical access variable data were collected as part of a baseline assessment for a related intervention study. Additionally, perceived barriers to MAM were assessed. Items for the barriers measure were taken from the Chinese MAM Screening Belief Questionnaire. A preliminary exploratory factor analysis, using principal axis factoring with an oblique rotation, yielded three factors:	43% (screened at least once)	Age, years of education, years in the US, yearly income, employment status, type of health insurance, language spoken daily	Perceived lack of access: 0.36 (95% CI: 0.16-0.82); perceived lack of need 0.27 (95% CI: 0.13-0.58); modesty 4.78 (95% CI: 2.11-10.85)	(17)
Molina <i>et al</i> , 2017	Design: Cross-sectional Country: NYC, USA Target population: Non-adherent Chinese American women Number of participants: 129 Age range: 41-76 years Study aim: To examine whether specific types of barriers differentiate between currently non-adherent ever and never Chinese American MAM screeners.	Inclusion criteria: Women self-identifying as being of Chinese ancestry, older than 40 years of age, who had not had a MAM in the past 12 months.	Baseline data from a randomized controlled intervention dedicated to improving screening	74% (at least once in their lifetime)	MAM barriers: No reason, knowledge, psychological, economic and other	MAM barriers: 14% indicated no reason, 35% knowledge-based reasons, 19% psychological-based	(28)

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First author, year	Study details	Selection process	Data collection	Screening adherence	Barriers studied	Main outcomes	Refs.
O'Hara <i>et al</i> , 2018	US-based Latin American women Number of participants: 536 Age range: 42-74 years Study aim: To test the associations between socioeconomic: And Latino-based concentration and distribution with barriers in obtaining a MAM in the past two years among a sample of Latinas who have utilized a federally qualified health centre Inclusion criteria: 1) Identification as Latina or Hispanic; 2) no receipt of a screening MAM within the past two years, confirmed by electronic medical records; 3) age 42-74 years; and 4) receipt of care from one of the four clinic sites within the past five years Design: Cross-sectional Country: Melbourne, Australia Target population: English-, Arabic-, and Italian-speaking women living or working in North West Melbourne, Australia	MAM among non-adherent Latinas residing in Western Washington State was collected. Electronic medical records were used to identify potential participants who met the eligibility criteria. Participants were then invited, screened and consented to participate during an in-person visit.		69% (last 2 years)	Emotional, knowledge and structural barriers; HLQ; reported receiving a breast screening invitation; number of comorbidities	Receiving a screening invitation and up-to-date screening (OR=3.46, 95% CI: 1.81-6.67); reported emotional barrier and up-to-date screening (OR=0.72, 95% CI: 0.54-0.94).	(33)

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Perez <i>et al</i> , 2017	<p>Number of participants: 317 employers of women in the target groups.</p> <p>Age range: 50-74 years</p> <p>Study aim: To explore if women from culturally and linguistically diverse backgrounds with lower health literacy reported greater emotional, knowledge, or structural barriers that may inhibit their participation in breast cancer screening.</p> <p>Inclusion criteria: English-, Arabic-, and Italian-speaking women; age 50-74 years; living or working in North West Melbourne, Australia.</p> <p>Exclusion criteria: Previous breast cancer diagnosis</p>	<p>of health literacy, identifying strengths and challenges related to engagement with health information and services.</p>				<p>Age; marital status; income; education level; acculturation; breast cancer knowledge; perceived barriers to screening; perceived stress; depressive symptoms behaviours.</p>	<p>CBE; Perceived barriers to screening (OR=0.75, 95% CI: 0.57-0.99).</p>
	<p>Design: Cross-sectional</p> <p>Country: San Diego, USA</p> <p>Target population: Latin American women in San Diego, CA</p> <p>Number of participants: 222</p> <p>Age range: 40-65 years</p> <p>Study aim: To investigate associations of psychological factors specifically, perceived barriers to screening, stress, and depressive symptoms with breast cancer</p>	<p>The study recruited 16 Catholic churches followed by 436 participants. Churches were eligible if they reported having at least 200 Latino families and at least one Spanish-language mass. Women</p>	<p>Surveys assessing socio-demographics (e.g., income and acculturation), psychological factors (e.g., perceived barriers to screening), and cancer screening behaviours.</p>	<p>46% (MAM in the past year)</p>		<p>Age; marital status; income; education level; acculturation; breast cancer knowledge; perceived barriers to screening; perceived stress; depressive symptoms</p>	(61)

Table SI. Continued.

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Pilkington <i>et al</i> , 2017	<p>screening behaviours.</p> <p>Inclusion criteria: Self-identifying as Latina, attending the church at least 4 times/month, having transportation, living within 15 min driving distance of the church</p>	<p>Design: Qualitative</p> <p>Country: Western Australia</p> <p>Target population: Aboriginal women</p> <p>Number of participants: 59</p> <p>Age range: 24–64 years</p> <p>Study aim: To examine perspectives on breast screening among Aboriginal women in WA, exploring the factors which impact on their participation in breast screening. It also sought to identify potential initiatives that could consolidate existing efforts to increase participation.</p>	<p>Details of the research project were emailed to the professional and personal networks of the lead researcher and they were asked to forward the information to any of their contacts who may be suitable.</p>	<p>90% (had a MAM at least once)</p>	<p>Fear of results, lack of knowledge, discomfort, other priorities, shame, other barriers, education, support, mobile van</p>		(24)

Table SI. Continued.

First author, year	Study details	Selection process	Data collection	Screening adherence	Barriers studied	Main outcomes	Refs.
Shaw <i>et al.</i> 2018	women's health. Participants could belong to both groups. Design: Qualitative Country: Singapore Target population: Malay women Number of participants: 27 Age range: 40-59 years Study aim: To identify motivators and barriers to screening and genetic testing. The research question was: What are Malay beliefs about cancer and prevention which impact women's decisions regarding BCS and genetic testing? Inclusion criteria: Malay women who speak English, self-identified as ethnically Malay and were aged 40-69 years	Pamphlets, word of mouth and face-to-face invitation	Peer-based focus groups	Most recent MAM last 15 years: 3.7%. Most recent MAM last 10 years: 11.1%. Most recent MAM last 2 years: 59.2%	Spiritual and religious beliefs: Aurat, fatalism, black magic. Traditional medicine: Distrust in western medicine/doctors, role of the Bomoh and traditional medication. Family closeness and intergenerational ties: Family burden, preventative medicine, generational beliefs, family and community values.	No statistically significant association was found.	(29)
Smalls <i>et al.</i> 2018	Design: Cross-sectional Country: Appalachia, USA Target population: Appalachian Women Number of participants: 289 Age range: >46 years Study aim: To examine the impact of social support on breast cancer screening patterns	Project recruitment involved initial contact with church leaders to describe the project. Thirty-two faith-based institutions in the four rural Appalachian Kentucky counties	Interview was conducted at the participant's home or other convenient location. Surveys assessing socio-demographics (e.g., income and acculturation), psychological factors (e.g., perceived	20% (MAM once in the last 2 years)	Age; marital status; educational status; income and current financial status; health insurance status; employment status; social support score	No statistically significant association was found.	(62)

Table SI. Continued.

First author, year	Study details	Selection process	Data collection	Screening adherence	Barriers studied	Main outcomes	Refs.
Vahabi <i>et al</i> , 2017	<p>in a sample of rural Appalachian women. Inclusion criteria: 1) English speaking; 2) ≥46 years; 3) having no personal history of breast cancer; and 4) not having had a MAM within the past 12 months.</p> <p>Design: Cross-sectional Country: Ontario, Canada Target population: Immigrant women from Muslim majority and non-Muslim majority countries in Ontario Number of participants: 238,218 Age range: 50-74 years Study aim: To address religious or culture-related barriers to breast cancer screening among Muslim and non-Muslim immigrant women. Inclusion criteria: 1) Were alive and eligible for healthcare coverage; 2) were in the 50-74-year age range for the entire study period of April 1, 2013 to March 31, 2015; and 3) resided in an Ontario Census Metropolitan Area: A geographical area with ~100,000 population.</p>	<p>are included in this study</p> <p>barriers to screening, and cancer screening behaviours.</p>	<p>(21)</p> <p>National databases on linked population level health and social administrative databases.</p>	<p>51% (MAM in the last 2 years</p>	<p>Sex of primary care physician; income</p>	<p>MAM: Having a male physician (0.88, 95% CI: 0.88-0.89); having no primary care physician (0.20, 95% CI: 0.18-0.21); residing in low-income neighbourhood (0.93, 95% CI: 0.92-0.91)</p>	

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	Exclusion criteria: History of breast cancer, mastectomy, axillary lymphectomy, axillary lymph node removal, or prophylactic ovary removal during March 31, 1988, to April 1, 2013. Women who died before March 31, 2015, and where country of birth was not specified.			No statistically significant association was found between perceived discrimination and breast cancer screening. (63)			
Valdovinos <i>et al.</i> , 2015	Design: Cross-sectional Country: USA Target population: Hispanic Community Number of participants: 2267	Participants were obtained from the HCHS/SOL.	The HCHS/SOL Cancer Questionnaire was used to measure cancer screening behaviours.	71.3% (received a MAM during the recommended time frame)	The influence of discrimination	Focus group revealed nine themes: Healthcare practices, lack of knowledge/misconceptions, negative perceptions and fear, time, modesty, role of religion, role of	(22)
Zorogastua <i>et al.</i> , 2017	Design: Qualitative Country: NYC, USA Target population: African American and African-born Muslim women in NYC. Number of participants: 40 (survey/focus	Recruitment sites included NYC faith-based institutions, community agencies, workplaces, and neighbourhood commercial markets and stores.	Mixed methods were used due to the exploratory nature of this study. Qualitative and quantitative data were collected through focus groups and individual questionnaires.	80.2% (yearly MAM) (women 40 and older)			

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groups) + 100 (survey) Age range: 18-70 years Study aim: Exploring the breast screening rates and factors that influence this population's disposition to adhere to cancer screening exams.	Participants were recruited through word-of-mouth, flyers, and in-person at community centres.	Focus groups and questionnaires aimed at eliciting screening knowledge and behaviours as well as barriers to screening, particularly those related to their cultural and religious beliefs.			men, role of community, stigma and shame.		

MAM, mammography; CBE, clinical breast examination; KA, Korean American; HLQ, Health Literacy Questionnaire; CCHS, Canadian Community Health Survey; BSE, breast self-exam; HCHS/SOL, Hispanic Community Health Study/Study of Latinos Sociocultural Ancillary Study; OR, odds ratio; CI, confidence interval; AOR, adjusted OR.