BMJ Open

Interventions to increase mammography screening uptake among women living in low-income and middle-income countries: a protocol for a systematic review

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ABSTRACT

Introduction Breast cancer is the most prevalent cancer and the second leading cause of cancer-related deaths among women in low and middle-income countries (LMICs), including sub-Saharan Africa. Mammography screening is the most effective screening method for the early detection of breast cancers in asymptomatic individuals and the only screening test that decreases the risk of breast cancer mortality. Despite the perceived benefits, it has a low utilisation rate in comparison with breast self-examination and clinical breast examination. Several interventions to increase the uptake of mammography have been assessed as well as systematic reviews on mammography uptake. Nonetheless, none of the published systematic reviews focused on women living in LMICs. The review aims to identify interventions that increase mammography screening uptake among women living in LMICs.

Methods and analysis Relevant electronic databases will be systematically searched from 1 January 1990 to 30 June 2021 for published and grey literature, including citation and reference list tracking, on studies focusing on interventions to increase mammography screening uptake carried out in LMICs and written in the English language. The search will incorporate the key terms: mammography, interventions, low- and middle-income countries and their associated synonyms. Randomised controlled trials, observational studies and qualitative and mixed methods studies of interventions (carried out with and without comparison groups) reporting interventions to increase mammography screening uptake in LMICs will be identified, data extracted and assessed for methodological quality by two independent reviewers with disagreements to be resolved by consensus or by a third author. We will use narrative synthesis and/or meta-analysis depending on the characteristics of the data.

Ethics and dissemination Ethical approval is not required as it is a protocol for a systematic review. Findings will be disseminated through peer-reviewed publications and conference presentations.

Strengths and limitations of this study

► This systematic review focuses on mammography screening uptake studies conducted in women living in low-income and middle-income countries.
► There are no restrictions on the types of study.
► Findings can highlight the need to implement existing strategies or further develop strategies aimed at increasing mammography screening uptake.
► Non-English electronic databases will not be searched.

PROSPERO registration number CRD42021269556.

INTRODUCTION

Cancer, a leading cause of death, is an important hurdle to increasing life expectancy globally. With the rapidly growing incidence and mortality of cancers, female breast cancer is presently the most commonly diagnosed cancer globally, with an estimated 2.3 million cases (11.7%) as well as responsible for 6.9% of cancer-related deaths.[1 2] In low and middle-income countries (LMICs) including sub-Saharan Africa (SSA), breast cancer is the most prevalent cancer and the second leading cause of cancer-related deaths among women after cervical cancer.[3] The incidence of breast cancer remains high in high-income countries (HICs) in comparison with LMICs.[4 5] Notwithstanding, there is a rise in both the number of incident cases and age-specific incident rates in LMICs.[5] Regardless of the difficulty in estimating the exact incidence of cancer, including breast cancer in SSA, available data provided strong evidence suggestive of increased incidence of breast cancer in SSA with an average incidence of 33.8 per 100 000 women per

year.[6] The mortality rates of breast cancer in LMICs are marginally higher than in HICs,[4 7 8] likewise, the case fatality rates from breast cancer seems to be significantly higher in LMICs than in HICs.[5 9] LMICs have low 5-year survival rates of breast cancer, ranging from 12% to 53%, compared with over 85% in HICs.[10 11]

Stage distribution at breast cancer diagnosis defines the prognosis of cancer and its treatment.[3 7–12] Breast self-examination (BSE), clinical breast examination (CBE) and mammography are the most commonly used breast cancer screening methods globally.[13 14] Mammography screening is the most effective screening method for the early detection of breast cancers in asymptomatic individuals[15] and significantly decreases the risk of breast cancer mortality by 15%–56%.[16] Adherence to regular mammography examinations cannot be overemphasised, as it has been shown to cause a reduction in risk of breast cancer mortality.[17] CBE is also important particularly for low resource settings as it has been shown to cause a 15% non-significant reduction in mortality.[18] While developed countries have implemented population-based mammography screening programmes,[19] it is not yet available in most LMICs, including SSA due to very limited resources.[3 5] Mammography screening obtainable in few countries of SSA is frequently only accessible by women in urban centres. There are prohibitive out-of-pocket expenses associated with travel and accommodation for women living in semiurban or rural settings.[20] In general, mammography has a low utilisation rate in comparison to BSE and CBE[20 21]; this might be as a result of the unaffordable cost of mammography screening among other factors.[7]

There are various intervention strategies to increase breast cancer screening. The Community Preventive Services Task Forces (CPSTF) categorised intervention strategies into the following: client-oriented interventions, provider-oriented interventions and informed decision-making.[22 23] Client-oriented interventions such as client reminders,[24] group education,[25] one-on-one education,[26] reducing clients' out-of-pocket costs,[27] reducing structural barriers[28] and small media[29] are recommended by CPSTF as strategies to increase breast cancer screening. Provider-oriented interventions such as provider assessment and feedback[30] and provider reminder and recall system[31] are interventions that increase screening for breast cancer. Meanwhile, there is insufficient evidence to determine the effectiveness of using client incentives,[32] mass media[33] as well as provider incentives[34] to increase screening for breast cancer. Also, there is insufficient evidence to determine the effectiveness of informed decision-making interventions, targeted at individuals in healthcare settings, community members outside of healthcare settings or healthcare systems and providers, in increasing screening for breast cancer.[35] The CPSTF recommends interventions that engage community health workers[36] and multicomponent interventions[37] to increase screening for breast cancer based on strong evidence of their effectiveness.

Systematic reviews summarising the impact of different interventions to increase uptake of mammography screening have been published.[38–45] A previous systematic review[39] established that access-enhancing interventions, interventions which improve access to and utilisation of mammography such as transportation to appointments, facilitated scheduling, mobile vans, vouchers and reduced mammogram cost, were most effective in increasing mammography screening. Another systematic review[40] concluded that interventions that used peer educators, incorporated multiple intervention strategies (ie, more than one intervention in a study) or provided easy access via vans, cost vouchers or home visits were effective in increasing screenings in low-income women. Different systematic reviews concluded that multiple interventions were the most effective strategy in increasing mammography uptake in women.[41 42] A review of trials[43] found that letter of invitation, mailed educational material, a phone call and some combined actions (such as a letter of invitation plus phone call and training activities plus reminders) seemed to increase uptake of mammography screening. A meta-analysis[44] and a systematic review[45] found that access-enhancing strategies followed by individually directed approaches such as individual counselling or education, client reminders and small media were effective in improving mammography uptake among ethnic minority women.

The studies included in the systematic review[41] of interventions to increase the uptake of mammography among low-income women were all conducted in HICs. In all published systematic reviews on interventions to increase uptake of mammography screening, we found none focused on women living inLMICs. Therefore, we aim to identify the interventions that increase mammography screening uptake in women living in LMICs.

METHODS AND ANALYSIS

This protocol has been developed following the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols (PRISMA-P) guidelines,[46] as shown in the PRISMA-P checklist. The systematic review is prospectively registered with PROSPERO.[47] Reporting of the systematic review will be informed by PRISMA guidance.[48]

Eligibility criteria

The inclusion and exclusion criteria will be guided by the Problem or population, Interventions, Comparisons or Control, Outcome, Time frame, and Study design framework.

Population

Studies whose population included asymptomatic women eligible for mammography screening will be included. We will exclude studies involving women with a prior diagnosis of breast cancer, women who have had a mastectomy and women living outside LMICs.

Interventions

Studies on client-oriented interventions such as client reminders, group education, one-on-one education, small media, mass media and client incentives will be included. Studies on provider-oriented interventions such as provider reminder and recall systems, provider assessment and feedback, and provider incentives will also be included.

Comparison

Studies with or without a comparator group will be included. The comparator group will be women who receive no active intervention or usual care (routine standard screening services such as BSE or CBE).

Outcomes

We will include studies with reported uptake of mammography screening as a result of the interventions.

Time frame

Studies on interventions to increase mammography screening uptake published between 1 January 1990 and 30 June 2021 from LMICs will be included.

Study design

Studies performed in LMICs are eligible for inclusion. We will include studies that employed quantitative, qualitative or mixed-method study design. Furthermore, only studies published in the English language will be considered.

Information sources/search strategy

Published, unpublished and grey literature in the English language will be searched. The search strategy will be developed in collaboration with a medical librarian (online supplemental file). Medical subject heading and free-text terms will be developed and combined to identify published studies on MEDLINE via the OVID interface. The search strategy will then be adapted for EMBASE, Global Health, CINAHL, ASSIA, PsycINFO, Web of Science, Cochrane Central Register of Controlled Trials (CENTRAL) and Google Scholar. Truncation commands (using root words to capture alternative word endings), proximity operators (for words within a chosen distance of each other) and Boolean logic operators (OR and AND) will be used, and to ensure maximum yield, a preliminary trial with search terms will be conducted and refined. We will search African regional databases, including African Index Medicus, African journal online and African Organisation for research and training in cancer, Open Grey and ProQuest Dissertations and Theses Global databases will be searched for more published, unpublished and grey literature. Additional papers will be located through hand searching of citations and reference list tracking and contacts with authors and experts in the field for further information.

Selection process

The searched studies identified by electronic database searches will be saved in the EndNote library. After deduplication, the titles and abstracts of the studies will be screened independently by two reviewers with disagreements to be resolved by consensus or by a third author. Full text of articles will be retrieved and two reviewers will independently assess the studies for eligibility of inclusion into the review. Disagreements will be resolved by discussion, 10% of the selected studies will be checked by a third reviewer for consistency. The reasons for the exclusion of those studies screened in the full text will be documented.

Data extraction

Two independent reviewers will perform data extraction using a predefined data extraction form, and differences between reviewers will be resolved by discussion and mutual agreement. Key characteristics of the studies of the review to be extracted include:

1. Author, publication year and funding source.
2. Journal citation.
3. Period of study (by year).
4. Country of study/study setting.
5. Study population (characteristics and total number enrolled).
6. Intervention details (types of intervention, the role of intervention, duration of intervention, duration of follow-up), primary outcomes including descriptive statistics, OR or risk ratio.

Quality assessment and risk of bias within studies

We will adapt and use the quality assessment tools listed in table 1. The results of methodological assessments of each study will be reported in narrative forms and tables. The overall quality of the entire set of included studies cannot be merged due to variations in tools and assessment methods. Disagreements that arise between the reviewers will be resolved through discussion.

Data synthesis

Due to the expected heterogeneity in the studies, we will first conduct a narrative synthesis of data from included studies according to Popay et al.[49] We will conduct a meta-analysis of data from included studies, if possible. Our primary analyses

Table 1 Quality assessment tools for various study designs

Tools	Study design
Cochrane risk of bias tool EPHPP tools[50]	Randomised controlled trials Cohort studies (one group pre +post (before and after)) Case–control studies Controlled clinical trials Cross-sectional studies Other non-randomised studies of intervention
CASP checklist[51]	Qualitative studies (eg, focused group discussions, interviews)
MMAT tools[52]	Mixed method studies

CASP, Critical Appraisal Skills Programme; EPHPP, Effective Public Health Practice Project; MMAT, Mixed Methods Appraisal Tool.

will pool overall summary effects by intervention type to determine the effectiveness of different interventions for increasing uptake of mammography screening. Heterogeneity will be assessed by Cochrane Q statistics and the I^2 statistics. A $p < 0.05$ will be considered to be significant for the Q statistical test and $I^2 > 75\%$ will represent substantial heterogeneity. Depending on the data collected, OR or any other suitable summary statistics will be used as the outcome measure. The choice of a random-effects model or a fixed-effects model for a meta-analysis will depend on the level of heterogeneity. We will conduct exploratory subgroup analyses by intervention type, if possible. A persistent high degree of heterogeneity ($I^2 > 75\%$) after exploring the subgroups will prevent a meta-analysis. Meta-bias assessment will be performed using Egger's test and visualised with a funnel plot. We will also conduct a sensitivity analysis. The Review Manager Software V.5.4 will be used for analysis.

Patient and public involvement

No patient involved

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