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The Role of mHealth Based Interventions in Enhancing Medication Adherence among Breast Cancer Patients: A Systematic Review of the Randomized Controlled Trials

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ADMINISTRATIVE INFORMATION

Support - No support.

Review Stage at time of this submission - Data analysis.

Conflicts of interest - None declared.

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Amendments - This protocol was registered with the International Platform of Registered Systematic Review and Meta-Analysis Protocols (INPLASY) on 14 October 2024 and was last updated on 14 October 2024.

INTRODUCTION

Review question / Objective Objective: to conduct a systematic review of existing scientific literature exploring the impact of mobile health (mHealth)- based interventions on medication adherence among breast cancer patients by answering the following questions:
1- What published studies have investigated the impact of mHealth-based interventions on medication adherence among breast cancer patientsWhat are the published studies about impact of mHealth-based interventions on medication adherence among breast cancer patients?
2- What are the types of mHealth based interventions were used for medication adherence among breast cancer patients?
3- What are the key findings of using mHealth-based interventions for medication adherence among breast cancer patients?

Rationale Breast cancer is the most prevalent disease to receive a diagnosis and the leading cause of cancer-related deaths among women worldwide. About 2.3 million women worldwide had a breast cancer diagnosis in 2022, and 670,000 people died from the disease. It is estimated that the number of new cases of breast cancer worldwide will rise from 2.3 million in 2020 to over 3 million instances by 2040. Medication adherence in breast cancer is associated with patients' incapacity to regularly take prescribed drugs as instructed. Pharmaceutical non-adherence in breast cancer patients may lead to less-than-ideal treatment outcomes, reduced therapeutic efficacy, an increased risk of disease progression or recurrence, and ultimately compromise the patient's quality of life and overall prognosis. Mobile health-based interventions play a critical role in medication adherence by providing digital solutions to handle the difficult issue of patients not adhering to prescribed prescription regimens. The use of mHealth to enhance medication adherence in patients with a range of chronic illnesses, including diabetes, chronic pulmonary obstructive disease, and acquired immunodeficiency syndrome, has been addressed

in previous studies. Therefore, this study aims to conduct a systematic review of existing scientific literature exploring the impact of mHealth-based interventions on medication adherence among breast cancer patients.

Condition being studied Breast cancer adult female patients.

METHODS

Search strategy An extensive literature search will be conducted to find studies about using mHealth-based interventions to enhance medication adherence among breast cancer patients in the following databases: PubMed, Medline, Cochrane, and Scopus, from inception until August 2024 using keywords and Medical Subject Headings (MeSH) terms. Search keywords to identify the population, intervention, and outcomes approach will be used to define the included studies in this review. Populations will not be confined to a single country or location. The search keywords will be found in either the title or abstract. The keywords will be used in connection with one another using Boolean operators ("OR", "AND") and truncation. A supplemental search will be done by hand-searching bibliography lists from all included papers and receiving email alerts for any newly published relevant papers from pre-specified databases to find other papers not identified through the electronic search.
Search strategy: (("mhealth" OR "mobile health technology" OR "phone calls" OR "mobile games" OR "mobile applications" OR "mobile application" OR "mobile app" OR "reminder system" OR "reminder" OR "text messaging" OR "message" OR "texting" OR "text message" OR "text message intervention" OR "SMS" OR "mobile based intervention" OR "intervention") AND ("medication adherence" OR "drug adherence" OR "drug compliance" OR "medication compliance" OR "patient compliance") AND ("breast neoplasm" OR "breast cancer" OR "breast carcinoma" OR "Mammary cancer" OR "Mammary carcinoma" OR "breast tumor") AND (randomized controlled trial)).

Participant or population Population: this review will include breast cancer female patients, ages 18 years old or above.

Intervention Intervention: using mHealth-based interventions to enhance medication adherence.

Comparator Comparator: routine practice or care for improving medication adherence.

Study designs to be included Study design: randomized controlled trial.

Eligibility criteria The researchers will follow the Population, Intervention, Comparison, Outcome, and Study Design (PICOS) framework to define the inclusion criteria for this systematic review.
1- Population: this review will include breast cancer female patients, ages 18 years old or above.
2- Intervention: using mHealth-based interventions to enhance medication adherence.
3- Comparator: routine practice or care for improving medication adherence.
4- Outcome: enhanced medication adherence.
5- Study design: randomized controlled trial.
The additional inclusion criteria will be (i) studies published in peer-reviewed journals in the English language; (ii) full-text article accessibility; and (iii) studies published from inception until August 2024.
Exclusion criteria will be as follows: (i) ongoing studies (ii)studies on non-human subjects; (iii) studies that were not published in English; (iv) study protocols, cross-sectional studies, descriptive studies, qualitative studies, cohort studies, reports, commentaries, preliminary studies, pilot studies, editorials, book chapters, systematic reviews, conference abstracts, or meta-analysis; and (v) articles with no accessible full text.

Information sources An extensive literature search will be conducted to find studies about using mHealth-based interventions to enhance medication adherence among breast cancer patients in the following databases: PubMed, Medline, Cochrane, and Scopus, from inception until August 2024 using keywords and Medical Subject Headings (MeSH) terms. Search keywords to identify the population, intervention, and outcomes approach will be used to define the included studies in this review. Populations will not be confined to a single country or location. The search keywords will be found in either the title or abstract. The keywords will be used in connection with one another using Boolean operators ("OR", "AND") and truncation. A supplemental search will be done by hand-searching bibliography lists from all included papers and receiving email alerts for any newly published relevant papers from pre-specified databases to find other papers not identified through the electronic search.
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Exclusion criteria will be as follows: (i) ongoing studies (ii)studies on non-human subjects; (iii) studies that were not published in English; (iv) study protocols, cross-sectional studies, descriptive studies, qualitative studies, cohort studies, reports, commentaries, preliminary studies, pilot studies, editorials, book chapters, systematic reviews, conference abstracts, or meta-analysis; (v) articles with no accessible full text; and (vi) grey literature.

Main outcome(s) Main outcome: to conduct a review of existing scientific literature exploring the impact of using mHealth-based interventions for medication adherence in breast cancer patients.

Data management Two reviewers (BA and RH) will complete data extraction independently using a standardized Excel spreadsheet (Microsoft Corp, Redmond, Washington). Any disagreement will be resolved by discussion between the two reviewers or consultation with a third reviewer (ZUB). The data extraction sheet will be based on Joanna Briggs Institute (JBI) data extraction forms. Data extraction for included studies will be the name of the first author, year of publication, study country, study design, study objectives, name of the mHealth-based intervention used, study duration, study participants, sample size, number of arms, medication adherence assessment tool, nature of intervention delivered, and a summary of major conclusions.

Quality assessment / Risk of bias analysis Two reviewers (BA and RH) will independently assess the quality of the included studies , during the data extraction phase. As the included studies will be randomized controlled trials, the Cochrane Risk of Bias Assessment Tool version 2 (RoB2) will be used, which includes 5 main domains (bias arising from randomization, bias due to deviations from intended interventions, bias due to missing outcome, bias in measurement of the outcome data, and bias in selection of the reported result). The risk-of-bias judgments are “low risk of bias,” “some concerns,” or “high risk of bias”.

Strategy of data synthesis A Synthesis Without Meta-Analysis (SWiM) will be conducted on the included studies.

Subgroup analysis No subgroup analysis will be performed.

Sensitivity analysis No sensitivity analysis will be performed.

Language restriction Will include randomized controlled trials published in English language only.

Country(ies) involved Affiliation for author 1 and author 2: School of Pharmaceutical Sciences, Universiti Sains Malaysia, Penang, Malaysia. Affiliation for Author 3: School of Pharmacy, Qatar University, Qatar. Mobile Health Based Interventions(mHealth), Medication.

Keywords Mobile Health Based Interventions (mHealth), Medication Adherence, Breast Cancer.

Contributions of each author

Author 1 - Rabia Hussain - Contribute to the conception and design of the study. Will manage the studies selection process from the title and abstract screening to full-text screening, the data extraction phase, contribute to the quality assessment process, and review the final draft and proofread the manuscript.
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Author 2 - Bayan F. Ababneh - Contribute to the conception and design of the study. Will import the search results from all databases, manage the studies selection process from the title and abstract screening to full-text screening, the data extraction phase, contribute to the quality assessment process, review the final draft, and proofread the manuscript.
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Author 3 - Zaheer-Ud-Din Babar - Contribute to the conception and design of the study. Will manage the studies selection process from the title and abstract screening to full-text screening, the data extraction phase, contribute to the quality assessment process, review the final draft, and proofread the manuscript.
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