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Effectiveness of educational interventions on hypertensive patients' self-management behaviours: an umbrella review protocol

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ABSTRACT

Background Although different educational interventions have been widely used to manage and treat hypertension, alone or in combination with other interventions, there is a significant variation in their claimed effectiveness.

Review question/objective The objective of this umbrella review is to determine the effectiveness of educational interventions, alone or in combination with other interventions, for improving blood pressure control and self-management practices among hypertensive patients. The review question is: Do educational interventions, alone or in combination with other interventions, improve self-management practices among patients with hypertension?

Methods We will conduct a review of systematic reviews involving studies that implemented educational interventions, alone or in combination with other interventions, designed to change self-care practices among hypertensive patients who are 18 years and above, regardless of their sex and ethnicity. Following the guidelines set forth in the Preferred Reporting Items for Systematic Review and Meta-Analysis statement, a comprehensive literature search will be conducted from September to December 2023 on six electronic databases: MEDLINE, Embase, PsycINFO, CINAHL, Web of Science Core Collection and Google Scholar. Search terms will be developed using database-specific indexed terms and text words derived from the review aim. We will present the effects of the educational interventions, alone or in combination with other interventions, on hypertension self-management practices. We will report the outcome data with 95% CIs for each study. Relative risk, mean differences or ORs will be used, depending on the measuring indices in each study.

Ethics and dissemination Ethical approval is not required as this study will use aggregated data from previously published systematic reviews. However, we have registered the protocol in PROSPERO. We confirm that all methods will be performed following the guidelines of the Declaration of Helsinki. The findings from this study will be disseminated through presentations at academic conferences and publication in peer-reviewed international journals.

PROSPERO registration number CRD42022375581.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ We will provide a comprehensive overview of existing evidence by aggregating findings from systematic reviews of randomised controlled trials.
⇒ We will ensure consistency in the selection and evaluation of included studies.
⇒ We will provide broader insights by examining various interventions across multiple studies.
⇒ Our study will assess the consistency of results across various systematic reviews, thereby enhancing the robustness of our conclusions.
⇒ Due to variations in methodologies and interventions, it may be challenging to draw definitive conclusions.

BACKGROUND

Due to the growing adult population and changes in lifestyles, the burden of hypertension and diabetes in sub-Saharan Africa has increased.[1] A significant and controllable risk factor for the onset of coronary heart disease, congestive heart failure, renal failure, stroke, eye issues and renal dysfunction is elevated blood pressure.[2 3] Self-management techniques are the actions people take to establish structure, routine and control in their lives. Patients take control of their health through self-management practices, which include moderate exercise (at least three times per week), weight loss and dietary changes.[4] According to the Joint National Committee on Prevention, Detection, Evaluation and Treatment of Hypertension, self-care activities are crucial in the management of hypertension.[5–8]

Education on hypertension is regarded as one of the important interventions in the management of hypertension. Along with blood pressure control, education on hypertension has been demonstrated to increase patient understanding and self-management

abilities, assisting patients in making decisions to effectively manage their medical state.[9 10] The use of mobile-application self-assisted educational intervention has shown to reduce the systolic blood pressure and diastolic blood pressure in patients with hypertension.[11] This result may be explained by the fact that giving patients personalised feedback and recommendations based on their health information and conditions may be able to help them interpret changes in their vital signs and educate them on how to handle various situations involving the variability in their vital signs.[11] Educational interventions using personalised medication management plans,[12–14] reminder systems[13] and counselling sessions[12] among patients with cardiovascular diseases have shown significant improvements in medication adherence rates. However, some studies showed varying results, indicating the need for tailored interventions to address individual barriers and motivations.[15 16] Educational interventions focusing on lifestyle modifications, including dietary changes, physical activity promotion and stress management, were found to be effective in enhancing self-management behaviours.[17 18] Several factors influenced the effectiveness of educational interventions on hypertensive patients' self-management behaviours, including the duration and intensity of the intervention, patient engagement,[19 20] health literacy levels,[21] cultural sensitivity,[21] and healthcare provider support.[19]

Healthcare professionals are intentional in delivering either one-on-one or group-based educational interventions, alone or in combination with other interventions, to help their patients achieve therapeutic goals. The significant variation in the claimed effectiveness of the different educational interventions used to manage and treat hypertension suggests the need for an umbrella review to detect significant findings that are repeated or related,[20 22–30] which could guide future research and the design of clinical trials.

Objective of this review

The objective of this umbrella review is to determine the effectiveness of educational interventions, alone or in combination with other interventions, for improving blood pressure control and self-management practices among hypertensive patients.

METHODS/DESIGN

This review protocol is being reported in accordance with the Preferred Reporting Items for Systematic Review and Meta-Analysis Protocols statement's guidelines for reporting (additional file). The protocol is registered on PROSPERO.

Eligibility criteria

Types of participants

This umbrella review will examine systematic reviews involving sample populations of the patient:

1. Aged 18 years and above.
2. Diagnosed with hypertension as the only chronic illness (≥50% of those included in the reviews should have been diagnosed with hypertension as the only chronic disease).
3. Ambulatory (≥ 50% of those included in the review should reside in their own homes).
4. No history of significant cardiac complications throughout the study (≥50% of those included in the reviews should not have had a history of significant cardiac complications).
5. Received an educational intervention, alone or in combination with other interventions (≥50% of those included in the reviews should have received an educational intervention, alone or in combination with other interventions).

Reviews that do not go into enough detail about the sample populations of the studies they include will be excluded. We will also exclude reviews on non-hypertensive patients and patients who do not have hypertension diagnosed as the only chronic illness.

Types of intervention(s)/phenomena of interest

This umbrella review will include reviews which evaluated various forms of educational interventions, alone or in combination with other interventions, that are designed to change the recommended hypertension self-care management practices namely: (1) medication adherence, (2) eating low-salt diets, (3) engaging in physical activities, (4) engaging in weight management practices, (e) reduction of alcohol consumption (f) smoking cessation

The educational interventions could either be one-on-one education or group-based teaching. Educational intervention in this umbrella review includes patient education workshops/seminars, individual counselling, written educational materials (pamphlets, brochures) and digital health education (using mobile apps or websites).

We will include systematic reviews of studies conducted between 2000 to 2023. Only studies reported in the English language will be included in this review. We hope to include systematic reviews of randomised controlled trials and cohort studies. Editorials, conference abstracts and letters will be excluded.

Outcomes

The primary outcome of this umbrella review will be changes in self-management practices, while the secondary outcomes will be the number of patients who were able to achieve blood control and the changes in health-related quality of life measured using standardised generic questionnaires like the SF-36 (Short Form-36), 15D (15 Dimension), and EQ-5D-3L (European Quality of Life 5 Dimensions 3 Level).

Search methods for identification of studies

We will conduct a comprehensive literature search from September to December 2023 on six electronic databases: MEDLINE, Embase, PsycINFO, CINAHL, Web of Science

Core Collection and Google Scholar. Search terms will be developed using database-specific indexed terms and text words derived from the review aim. Search terms will be words related to educational intervention AND hypertensive patients AND hypertension self-management practices AND systematic reviews (online supplemental appendix 1). Before charting the evidence, the search will be conducted once again on the selected databases to find any relevant articles that may have escaped notice during the initial search (eg, newly published). We will manage the search results using EndNote and RefWorks. Full text of potentially relevant articles will then be screened against the review's inclusion and exclusion criteria. Differences in opinion will be resolved through discussion to reach a mutual agreement. The study screening and selection process will be reported using the standardised JBI instrument designed for umbrella reviews[31] (online supplemental appendix 2). We would include systematic reviews that reported study-specific information such as the 95% CIs, effect size and sample size.

Charting the evidence

Studies which meet the eligibility criteria will be appraised for methodological quality using the standardised critical appraisal instruments from the JBI System for the Unified Management, Assessment and Review Instrument and The JBI Reviewers' Manual 2014[32] (online supplemental appendix 3). To ascertain whether research quality affects the conclusions of the umbrella review, we will apply sensitivity analysis based on the study quality. Using the following scale, we will evaluate each study's quality based on the findings of the critical appraisal: Low quality is defined as meeting 0–33% of the requirements, medium quality is defined as meeting 36–66% of the criteria and high quality is defined as meeting 67% of the criteria. Results from the included studies will be extracted using the JBI Data Extraction Form for Review for Systematic Reviews and Research Syntheses[33] (online supplemental appendix 4). The information to be extracted from each study will include study details, author/year, study objectives, participants (characteristics and number), setting/context, description of the intervention (randomised or non-randomised), search details, sources searched, range (years) of included studies, number of studies included, types of studies included, country of origin of included studies, appraisal, appraisal instrument used, appraisal rating, method of analysis, outcomes assessed, results/findings, effect size reported with 95% CI, the study-specific estimated risk for side effects/negative outcomes reported with 95% CI (risk ratios, ORs or mean differences), significance/direction and heterogeneity.

If we identify two systematic reviews that evaluated the effect of an educational intervention alone or in combination with other interventions on the same self-management behaviours as medication adherence, smoking cessation or alcohol reduction, we will choose the one that had the most studies included (or, if there were an equal number, the more recent one).

Outcome measure

Our primary outcome will be changes in hypertension self-management behaviours associated with an educational intervention.

We want to find out which educational intervention worked in improving the self-management behaviours of hypertensive patients (if it did not work, why?), what type of educational intervention (one-on-one or group based) is most effective in improving self-management behaviours and delivered by who (nurse, pharmacist or medical doctor).

The results will then be narratively summarised and discussed with respect to the review's objective and the broader scientific literature. There will be recommendations made, gaps in the body of evidence will be pointed out and future research directions will be emphasised.

Data extraction and management

Using the JBI data extraction form for review for systematic reviews and research syntheses, two members of the review team (BOU-K, AI, AAB, AS, MMA, UAK), working independently, will extract data and summarise information on studies. Any disagreements will be resolved through dialogue with a third review author (INS). The information about the longest follow-up will be retrieved from studies that provide more than one outcome period (eg, 6 and 12 months). In cases where data are discovered to be lacking, we will get in touch with the study's corresponding author to ask for the missing information or to get study specifics clarified.

Measures of treatment effect

We will present the effects of the educational intervention, alone or in combination with other interventions, on hypertension self-management practices (medication adherence, low salt diet, physical activity, weight management practices, alcohol reduction and smoking cessation). We will report the outcome data with 95% CIs for each study. Continuous outcomes between the intervention and control groups will be presented and quantified as mean difference (MD) and overall effect size, for example, the prevalence of hypertension self-management practices pre-intervention and post-intervention. Relative risk (RR), MDs or ORs will be used, depending on the measuring indices in each study, for the primary and secondary outcomes. Where possible, we will estimate a common effect size for comparisons, for example, by converting IRR (Inter-Rater Reliability) to RR and then OR. Subgroup analyses will be performed for primary outcomes that are reported in at least two trials in each subgroup. These analyses will be stratified by the nature of the intervention to identify which educational interventions are effective for blood pressure control.

Patient and public involvement

No patient involved.

Analysis software

We would perform analysis using the most recent meta-analytic software in R packages.[34] Furthermore, we will

explore the best analytical options for estimating heterogeneity between studies.[35]

DISCUSSION

In this review, we will determine which educational interventions—and the theoretical frameworks that underlie them—were most promising for additional research and improvement. We hope to identify significant findings that are repeated or related in various systematic reviews. We will make robust recommendations by selecting high-quality and well-designed studies. This will serve as a guide to researchers towards future research and the design of clinical trials. Findings from our study will inform decisions and update recommendations for clinical practice.

Potential strengths and limitations

We will provide a high-level synthesis of evidence by summarising findings from multiple systematic reviews, giving a broader perspective on the effect of educational intervention on self-management behaviours among patients with hypertension. We anticipate some limitations in this study. First, due to variations in methodologies and interventions, it may be challenging to draw definitive conclusions. However, we will conduct subgroup analysis to identify potential sources of heterogenicity and present findings as a narrative synthesis if statistical pooling is inappropriate. Second, we anticipate that some of the systematic reviews which meet the inclusion criteria may have flaws with its methodology, data analysis or reporting. We will use the JBI Critical Appraisal Checklist for Systematic Reviews and Research Syntheses (online supplemental appendix 2) to report only high-quality systematic reviews. We will report potential biases in the primary studies included in the systematic reviews. We would aim to report all potential limitations in the umbrella review at the end of this study.

Ethics and dissemination

Ethical approval is not required as this study will use aggregated data from previously published systematic reviews. However, we have registered the protocol in PROSPERO. We confirm that all methods will be performed following the guidelines of the Declaration of Helsinki. The findings from this study will be disseminated through presentations at academic conferences and publication in peer-reviewed international journals.

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Contributors BOU-K, UAK and INS devised the study and developed conceptual ideas. BOU-K, UAK, AAB, AS and MMA led the protocol development. BOU-K, UAK, AI and INS drafted the manuscript. All authors helped to refine and redraft the manuscript and approved the final version.

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