INPLASY

Structured self-management education programmes for Cardiometabolic diseases in sub-Saharan Africa (SSA): A Systematic Review Protocol

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ADMINISTRATIVE INFORMATION

INTRODUCTION

*R*eview question / Objective Review Question What is the effect size of structured self-management education programs on diabetes, hypertension and obesity care outcomes in SSA?

Aim/Objective of review
To synthesise the literature on structured self-management education programs for cardiometabolic diseases specifically diabetes, hypertension and obesity in sub-Saharan Africa

Population:
Studies conducted in Sub-Saharan African countries that report on adults diagnosed with diabetes, hypertension, and obesity
Intervention:
Structured self-management education programs aimed at empowering individuals to manage their cardiometabolic conditions through lifestyle modifications, medication adherence, and self-monitoring practices.

Comparison:
The control group will consist of patients with CMD receiving usual care.
Outcome:
Assessment of the effectiveness of structured self-management education programs in Sub-Saharan Africa in terms of:
1. Glycemic control (for diabetes patients).
2. Blood pressure control (for hypertension patients).
3. Adherence to medications and lifestyle recommendations.
4. Health-related quality of life.
5. Reduction in cardiovascular events (e.g., myocardial infarction, stroke)

Introduction
Noncommunicable diseases account for 41 million deaths annually globally, with 77% of these occurring in low- and middle-income countries (LMIC).(1) The burden of non-communicable diseases including cardiovascular diseases is rising in SSA.(2) Cardiovascular diseases (CVDs) are the leading causes of mortality related to NCD.

(3) In 2013, the number of deaths due to CVDs in the Sub-Saharan Africa (SSA) region was approximately one million, constituting 38.3% of all non-communicable disease fatalities and 11.3% of deaths from all causes in SSA.(4)

Cardiometabolic diseases (CMD) comprise a cluster of conditions, including diabetes, hypertension, and obesity, which are strong risk factors for cardiovascular diseases such as stroke and ischaemic heart disease.(5,6) It has been projected that the number of people in SSA with diabetes, a major component of NCDs, will rise from 7.2 million in 2000 to 18.7 million in 2030, representing an alarming 161% increase. The projected increase in the prevalence of diabetes in SSA is much higher than the projected global average of 114%.(7)

In developing countries, approximately one-third of adults have high blood pressure (HTN) on average, and it is projected that by 2025, three-quarters of individuals in low- and middle-income nations will have HTN.(8) Among patients with both hypertension and diabetes in Ghana, the prevalence of chronic kidney disease is 28.5%.(9)

The prevalence of overweight is growing in low- and middle-income nations. In Africa, the number of overweight children below 5 years has risen by nearly 23% since 2000.(10) In Ghana, nearly 43% of adults are either overweight or obese with a higher prevalence of obesity/overweight among urban dwellers compared to rural dwellers.(11)

Recommendations for self-care behaviours are similar across various cardiometabolic diseases. Additionally, cardiometabolic diseases tend to cluster in individuals.(5) Self-care can lead to reduced risk of cardiovascular diseases, prevent other diseases, and improve quality of life.(12,13) Structured self-management education has been shown to improve knowledge, self-management behaviour, metabolic risks, and psychological outcomes in persons with increased cardiovascular risks, cardiovascular disease and diabetes in high-income countries.(14–16) This is a systematic review of structured self-management education programs in sub-Saharan Africa, for cardiometabolic diseases.

Rationale Rationale of the review

Many African countries are in the epidemiological transition phase where they face a double burden of communicable and non-communicable diseases. Yet, the health systems are not efficient enough to handle this double burden. In sub-Saharan Africa (SSA), the majority of NCDs are cardiovascular diseases responsible for about approximately 13% of all deaths and 37% of all NCDs(17). The majority (80%) of the burden of CVD mortality and morbidity is driven by hypertension and related heart disorders(18). Whereas the leading cause of heart failure among adults in high-income countries (HIC) is IHD, in SSA the leading causes are hypertensive heart disease, cardiomyopathy, rheumatic heart disease, and congenital heart diseases.(18)

Even though age-adjusted CVD mortality rates in SSA are low compared to HIC, absolute number of CVD deaths has increased by more than 50% in the past thirty years in this region (18). This has led to a high number of disability adjusted life years (DALYs)(19) . IHD, stroke, and hypertensive heart disease are the three most common causes of CVD death in SSA (20). Hypertension prevalence in individuals ≥18 years old is 30% in SSA (40% in urban and 20% in rural populations) versus 20% in HIC; prevalence of diabetes in ≥18 years old is 7.1% in men and women in SSA compared to 6–8% in men and 3–6% in women in HIC; dyslipidaemia prevalence in adults is 25% in SSA versus 40–60% in HIC ; physical inactivity prevalence is 22% in SSA versus 29–40% in HIC; and obesity whose prevalence rates are variable in SSA and higher among women (2–40%) compared to men (1–15%) versus 18–35% in women and 12–30% among men in HIC(17). These facts show how SSA has caught up with HIC in this epidemiological transition.

The lack of adequate health care systems and infrastructure to manage CVDs, with strong evidence of limited number of hospitals equipped with adequate specialist cardiac services in this region, including shortage of medications is of concern.(21) There is a very low proportion of physicians to population, with a majority of SSA countries having <5 physicians per 10,000 people (22). The governments of most African countries have still not appreciated the worrying nature of the situation. Most member States of the African Region of the World Health Organization are still budgeting less than the target of allocating at least 15% of annual expenditure to health under the Abuja Declaration(23).

There is a need for a sustainable solution to mitigate this growing burden. Structured self-management education is one of the interventions that has been of great interest in recent years. Research has shown that the majority of the global cardiovascular disease burden falls on people living in LMICs.(24) However, there are significant disparities in the availability and effectiveness of self-management education programs between high-income countries (HICs) and LMICs.(24) While the effectiveness of self-management interventions for cardiometabolic diseases in HICs is well-documented, the use of these strategies in LMICs is still limited.(25) This is further compounded by the lack of resources and healthcare infrastructure

in LMICs, which hinders the implementation of structured self-management education programs. (25)

Self-management education is a key component of the chronic care model, a cost-effective model, which has been shown to improve interdisciplinary care and outcomes of cardiometabolic diseases. (26) Self-management includes any intervention that enables patients to better manage their health condition(s) daily. This includes technological interventions, as well as non-technological interventions such as educational materials, in-person training sessions, and social support.(25) With the rising NCD prevalence, and healthcare resource constraints in LMICs, self-management provides an exciting means of managing the NCD burden in SSA..

Condition being studied Diabetes, Hypertension, Obesity, cardiometabolic disease.

METHODS

Search strategy The search strategy will be built using the MESH term and Boolean operators. The search strategy would follow the PRESS Guideline Evidence-Based Checklist. Databases to be searched are PubMed/Medline, Cochran Library, CINAHL, Web of Science and Embase. Index terms and synonyms

PICO Index/mesh term Synonyms/Tab
Population
Type II Diabetes

adult-onset diabetes; adult onset diabetes; diabetes, type 2; diabetes, type II; Non-insulin dependent diabetes; Non-Insulin Dependent Diabetes Mellitus; Noninsulin dependent diabetes; Noninsulin dependent diabetes mellitus; NIDDM; T2DM; T2D; T2DM; type 2 diabetes mellitus; Type 2 diabetes; Type II diabetes; Type II diabetes Mellitus; diabetes mellitus type 2; diabetes mellitus type II;
Hypertension HTN; HPT; HPTN; systo-diastolic hypertension; elevated BP; hypertensive; essential hypertension; primary hypertension; elevated blood pressure; high blood pressure
Obesity Central obesity; Intra-abdominal obesity; Truncal obesity; Obese; Overweight; Morbid obesity; Morbidly obese; Body mass index/ BMI
Cardiometabolic disease/s Cardiometabolic syndrome; Insulin resistance syndrome; Diabetic cardiomyopathy; Hypertensive cardiomyopathy; Cardiovascular disease; Non communicable disease; CMD; Cardio-metabolic disease/s

Intervention

structure Curriculum, plan, program(me), education Self-management education Self care; Self-care education, health education, health promotion, SEP, structured education program/me, diabetes self-management education, DSME, group education, individualized education, self-management education, structured education,

Comparator
Usual care Routine care, adhoc, unstructured, demand management, patient education
Outcome
Care outcome/s, target-organ damage, end-organ damage/disease, macro/microvascular complications, neuropathy, nephropathy, retinipathy, QoL, quality of life
Type of studies
Controlled trials Randomized control trial, RCT, non-randomized control trial, non-RCT, cohort, case-control, single-blind(ed) study, double-blind(ed), unblind(ed,) triple-blind(ed)

Setting
SSA Black Africa, Tropical Africa, South of the Sahara, Sahel Region, African Savanna, West(ern) Africa, East(ern) Africa, Central Africa, South (ern) Africa, Sub-Saharan Region, African South of the Sahara, African Sub-Continent, Africa South of the Equator, Sub-Saharan Belt, Southern Hemisphere Africa.

Angola, Benin, Botswana, Burkina Faso, Burundi, Cabo Verde, Cameroon, Central African Republic (CAR), Chad, Comoros, Democratic Republic of the Congo (DRC), Djibouti, Equatorial Guinea, Eritrea, Eswatini (formerly Swaziland), Ethiopia, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Ivory Coast (Côte d'Ivoire), Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Republic of the Congo, Rwanda, São Tomé and Príncipe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, South Sudan, Sudan, Tanzania, Togo, Uganda, Zambia, Zimbabwe.

Participant or population Patients living with Diabetes, Hypertension, Obesity, cardiometabolic disease.

Intervention Structured self-management education programs for cardiometabolic diseases.

Comparator Usual care.

Study designs to be included Intervention studies-RCT, non-randomised controlled trials, longitudinal observational studies-cohort;case-control.

Eligibility criteria Population or participants
Studies on adults above the age of 18 years with hypertension, diabetes and or obesity

Intervention
Controlled trials that have a Structured self-management education program as their intervention

Comparison
Studies that have usual care for CMD as an intervention

Outcome
Studies that reported relevant CMD outcomes.
1. Change in mean systolic BP from baseline
2. Change in mean HbA1c from baseline
1. Change in mean body weight form baseline
2. Change in HRQoL
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Design
Intervention studies-RCT, non-randomised controlled trials, longitudinal observational studies-cohort;case-control;

Language
Studies published in the English language.

Duration
Studies published from inception to date March 2024.

Information sources Databases to be searched are PubMed/Medline, Cochran Library, CINAHL, Web of Science and Embase. We will make contact with authors when additional clarification is needed or if only abstracts are available. We will search reference list of retrieved papers as well.

Main outcome(s) 1. Change in mean systolic BP from baseline 2. Change in mean HbA1c from baseline 3. Change in mean body weight form baseline.

Additional outcome(s) Change in HRQoL; Change in self-efficacy.

Data management Screening and study selection Screening and study selection would be based on predefined inclusion and exclusion criteria. The Rayyan software would be used for screening all articles after the literature search. Duplicate articles will be removed before screening and selection. The screening and study selection process would follow a two-stage procedure. The first stage will involve conducting a coarse sieve by reviewing the titles and abstracts of identified publications. In the second stage, full texts of the included and

undetermined studies are further screened against the same criteria. Only studies that meet the inclusion criteria are included for evidence synthesis. The title and abstract screening will be done by 2 reviewers according to inclusion and exclusion criteria. A third reviewer would assist in reaching a consensus where there is disagreement. Data extraction One review team member will retrieve the whole texts of any publications that fit the eligibility criteria and conduct an independent assessment of them. If further clarification is required, a second reviewer is on hand. A single reviewer who is not blind to the journal or author's information will extract the data. A standardised data extraction sheet will be used to extract the data. The second reviewer or other research team members will be consulted to address any uncertainties that arise during the extraction process. One email correspondence attempt will be made to the appropriate author in cases where access to full-text articles is restricted or where data is inadequate. The publication shall be excluded if it is still unclear.

Quality assessment / Risk of bias analysis Risk of bias (quality) assessment The risk of bias would be assessed using the Cochrane Collaboration modified tool for assessing the risk of bias (Rob, ROBINS-1). The domains for scoring the studies would include random sequence generation, allocation sequence concealment, blinding of participants and researchers, and blinding of outcome assessment. Additional domains would include assessing incomplete outcome data, and selective outcome reporting. The assessment of the quality of each study will be done by two authors (STE and SNKA) and the overall risk of bias would be classified under one of these three categories: low risk, high risk or unclear risk. A third author (RL) or reviewer would assist in reaching a consensus where there is disagreement on the quality assessment between the first 2 reviewers.

Strategy of data synthesis Strategy for data synthesis The literature search and article selection process will be illustrated using the PRISMA flow chart. All studies included in the systematic review will be summarised in a Table. The findings of the review will be narratively summarised. The summary measures that would be included are the mean HbA1c and standard deviation (Diabetes), mean BP control (Hypertension), mean BMI, and HrQOL.

Subgroup analysis Sub-group analysis will be done using the disease categories i.e diabetes, hypertension and related disorders and obesity.

Sensitivity analysis If we have adequate number of papers for a meta-analysis this will be done.

Language restriction English language and French publications.

Country(ies) involved Ghana.

Keywords diabetes, hypertension, obesity, cardiometabolic diseases, NCD, structured education programs, self-management education, SSA.

Dissemination plans Publication in peer reviewed journals with high impact factor.

Contributions of each author
Author 1 - Roberta Lamptey - Conceptualised the idea, drafted the manuscript together with other authors and edited final the manuscript and submitted it for registration.
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