Physical activity interventions implemented for older people in sub-Saharan Africa: protocol for a scoping review

Shane Naidoo, Samuel Otoo, Niri Naidoo

ABSTRACT

Introduction The global population of older people (OP) is on an upward trajectory, with predictions that the number of OP would surpass the population of younger people by 2050. In sub-Saharan Africa (SSA), death from infectious diseases in the younger population and lower fertility rates are influencing a double burden contributing to an exponential growth in the ageing population. Non-communicable diseases (NCDs) are the leading cause of mortality and disability in the population of OP in SSA. Physical activity (PA) has been proven to have positive benefits in reducing the prevalence of NCDs in OP. The objective of this scoping review is to summarise the evidence on the feasibility and effectiveness of PA interventions that have been implemented among OP to address PA levels, blood pressure, blood glucose levels, cognitive function, quality of life and body mass index in SSA.

Methods and analysis The Joanna Briggs Institute (JBI) methodology will be followed for this scoping review. An electronic search of PubMed, EBSCOhost (Academic Search Premier, AfricaWide Information, CINAHL, Health Sources Premier Academic/Nursing), Scopus and ProQuest (grey literature) will be done from 2010 onwards to identify reports of randomised controlled studies published in English using relevant keywords. 2010 was selected as the cut-off point for inclusion in order to focus only on relatively recent evidence, as it is more likely to remain relevant and applicable to present-day settings. The searches will be performed by the primary reviewer in conjunction with a senior librarian. Full independent review of the uploaded articles will be done by two reviewers, by title and abstract, and thereafter by full text, based on specified inclusion and exclusion criteria. The reference list of included articles will be scanned for additional relevant articles. Disagreements will be arbitrated by a third reviewer. Results will be presented in a descriptive form as well as in tabular, graphical and diagrammatic formats, following the Preferred Reporting Items for Systematic Reviews and Meta-analyses Extension for Scoping Reviews.

Ethics and dissemination The review will be extracting and reporting on data from published literature so there is no requirement for ethics approval. The findings of the review will be submitted for publication in a peer-reviewed journal.

STRENGTHS AND LIMITATIONS OF THIS STUDY

⇒ This scoping review will follow JBI methodology.
⇒ The identification and synthesis of data will cover grey literature in addition to peer-reviewed academic publications.
⇒ A potential limitation is that only studies reported in English language will be included.
⇒ The review will focus on randomised controlled studies only.

INTRODUCTION

Global population is on an upward trajectory and projected to have an increase of 3.7 times its current size by 2050. However, the growth in the population of older people (OP), over 60 years, is predicted to increase up to ten times its current size accounting for 22% of the global population. It is projected that by 2050 the global population of persons 60 years of age and older will be 2.1 billion, of which 79% would be from low-income and middle-income countries. In 1950, no country had a population of OP greater than 11%, however, this has been projected to reach as high as 38% in some countries by 2050, with the global population of OP being greater than that of adolescents (10–24 years). Socioeconomic evolution globally has been the major contributor to this projected statistic as fertility rates have dropped contributing to fewer births and a smaller younger population. In Africa, high mortality rates in the younger population arising from infectious diseases are causing a double burden contributing to a smaller population of younger people especially in sub-Saharan Africa (SSA). The number of OP in SSA may not be as sizeable as other regions in the world currently, however, the growth rate in this population is accelerating rapidly, from 47 million in 2015 to a projected 147 million by 2050. Non-communicable
diseases (NCDs) in particular cardiovascular diseases have been the main contributor of disability-adjusted life-years in this cohort. Low levels of physical activity (PA) and sedentary behaviour have been shown to have an indirect correlation with the prevalence of NCDs.

Satisfactory levels of PA have been shown to have positive benefits on the health and well-being of OP. Appropriate levels of PA in OP have been shown to help prevent age-related cognitive deterioration, reduce the risk of metabolic disease, reduce the risk of falls and improve balance. The WHO has recommended that people 60 years old and above, engage in a minimum of 150 min moderate-intensity activity or 75 min vigorous-intensity activity weekly to help maintain a healthy lifestyle. SSA has the fastest growing population of OP globally, yet there is dearth in the literature on a structured PA intervention to help address the high prevalence of NCDs in OP from this region.

The following research questions have been formulated:

Primary research question: What PA interventions have been implemented in SSA to address PA levels in OP?

Secondary research question: How effective have these interventions been on outcome measures of PA levels, body mass index (BMI), blood pressure (BP), blood glucose levels, cognitive function or quality of life (QoL)?

The proposed scoping review aims to summarise and synthesise research done in SSA, providing an overview of PA interventions implemented in addressing levels of PA in relation to NCDs in OP. This will guide key role players to implement appropriate interventions when working with OP and assist with efficient standardisation of PA. It is expected that the scoping review will yield interventions that target PA and BMI. These findings would make valuable contribution towards the design and development of intervention programmes for the OP, to impact the burden of NCDs, which are largely preventable.

**METHODS AND ANALYSIS**

The JBI framework for scoping reviews will be followed and the results will be reported in accordance with Preferred Reporting Items for Systematic Reviews and Meta-analyses Extension for Scoping Reviews (PRISMA-ScR). Any deviations from the protocol (where the JBI extraction template does not include results identified from selected studies by the reviewers) will be recorded with valid reasons in the final report of the scoping review.

**Identifying relevant studies**

The JBI Population, Concept and Context framework will be used to determine the eligibility of the research questions for the scoping review (table 1).

**Search strategy**

A three-step search strategy will be used, as guided by JBI, to select and identify relevant articles.

**Step 1**

An initial online search of PubMed and CINAHL using keywords (online supplemental file 1) to identify research

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Inclusion criteria</th>
<th>Exclusion criteria</th>
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<tbody>
<tr>
<td>Population</td>
<td>The review will include participants that were 60 years of age and older. The review will not discriminate against biological sex, race or language of participants.</td>
<td>Participants under 60 years of age.</td>
</tr>
<tr>
<td>Concept</td>
<td>For purposes of this review PA will be defined as ‘bodily movement produced by the skeletal muscles that results in energy expenditure.’ Outcome measures of PA and BMI will be explored as they are fundamental in assessing QoL in this cohort. The PA could be supervised or lifestyle PA interventions of any duration or intensity and will be reported accordingly. Other objective measures that will be reported on include cholesterol, BP, blood sugar levels and cognitive function.</td>
<td>Outcome measures of aerobic fitness, exercise, PA intensity and non-behavioural measures were excluded as they are not accurate indicators of PA.</td>
</tr>
<tr>
<td>Context</td>
<td>The review will focus on studies done in SSA notwithstanding culture, setting (such as acute care, primary healthcare or the community) or biological sex-based interests.</td>
<td>Studies conducted outside the borders of SSA.</td>
</tr>
<tr>
<td>Language</td>
<td>English published studies</td>
<td>Non-English published studies</td>
</tr>
<tr>
<td>Search dates</td>
<td>Studies published from 2010 onwards to direct focus on relatively recent evidence as it is more likely to remain relevant and applicable to present-day settings.</td>
<td>Studies published prior to 2010.</td>
</tr>
<tr>
<td>Type of study</td>
<td>The review is concerned with randomised controlled trials that incorporated or introduced a PA intervention to address levels of PA in OP.</td>
<td>Cohort, case–control, cross-sectional studies, case reports editorials and opinion studies will be excluded.</td>
</tr>
</tbody>
</table>

BMI, body mass index; BP, blood pressure; OP, older people; PA, physical activity; PCC, Population, Concept and Context; QoL, quality of life; SSA, sub-Saharan Africa.
papers relevant to the research question will be done. Index terms and text words in the abstracts and titles of the relevant retrieved studies will be used to build a full search strategy.

**Step 2**
A second online literature search using keywords and MESH terms (online supplemental file 2) identified in step 1 will be done in PubMed, EBSCOhost (Academic Search Premier AfricaWide Information, CINAHL, Health Sources Premier Academic/Nursing) and Scopus with guidance from a senior Librarian at the University of Cape Town. Keywords and terms will be adapted to suit the search engines in relevant databases. These studies will be peer-reviewed articles with full text available and published from 2010 to current search date. Grey literature will be searched on ProQuest. Peer review of electronic search strategies will be done on the relevant databases by an independent senior librarian at the University of Cape Town to ensure validity of the search methodology.

**Step 3**
The reference lists of all included studies in the review will be examined for sources of additional information.

**Selection of eligible studies**
The study will include randomised controlled trial (RCTs) on any PA intervention that was used to primarily effect the levels of PA in OP in SSA. RCTs that used a PA intervention in this cohort to effect outcome measures for BP, QoL, BMI, cholesterol and cognitive function will also be synthesised. Systematic reviews that meet the inclusion criteria will also be considered.

Following the search, all identified citations will be collated and uploaded into Rayyan and duplicates will be removed. A pilot study of 25 randomly selected uploaded abstracts and articles will be screened blindly by three reviewers (SN, NN and SO) in Rayyan for assessment against the inclusion and exclusion criteria. A discussion among the reviewers will follow to ensure consensus. Full details on the pilot study will be presented in the appendix of the final review. Once a general agreement (90%) of pilot studies is reached the primary (SN) and secondary reviewer (SO) will independently screen all the uploaded citations for eligibility. Disagreements will be resolved by a discussion between the primary (SN) and secondary (SO) reviewers and if consensus is not reached, the third reviewer (NN), will be included. Full text of abstracts and titles found to be relevant will be uploaded onto Rayyan. The full text of selected citations will be assessed in detail against the inclusion criteria by the primary reviewer (SN) and the secondary reviewer (SO). Should there be disagreement between the reviewers, a discussion will be undertaken. Should the discussion not yield resolution, the third reviewer, (NN) will be included to reach consensus. Articles that are excluded from the review will be recorded with valid reasons. The full source selection will be presented in a flow chart (online supplemental file 3) following PRISMA-ScR guidance.

**Charting the data**
Data will be extracted from papers included in the scoping review by the primary (SN) and the secondary (SO) reviewers using the JBI data extraction tool (online supplemental file 4). The data extracted will include specific details about the participants, concept, context, study methods and key findings relevant to the research question.

The JBI draft extraction tool will be modified and revised as necessary during the process of extracting data from each included evidence source. Modifications of the extraction tool will be detailed in the scoping review. The data will be charted by the primary reviewer (SN) and will be verified by the secondary reviewer (SO). Any disagreements will be discussed between the reviewers and should a consensus not be reached the third reviewer, (NN) will be included to facilitate reaching consensus. If necessary, authors of papers will be contacted to request missing or additional data, where required.

**Data synthesis**
Data extracted from relevant studies will be grouped into similar categories to fit the objectives of the research question. STATISTICA V.13.5.0 and SPSS Version 27 will be used to analyse the data. Tests for normality will be undertaken and descriptive statistics used. If the data are normally distributed, the paired t-test will be used to determine whether there are within group differences. If the data are not normally distributed, equivalent non-parametric tests will be used (Sign test and Mann-Whitney U test). Data will be presented in a narrative summary as well as in tabular, graphical and diagrammatic formats. Any disagreements in the presentation will involve a discussion between the primary (SN) and secondary reviewer (SO). Should a consensus not be reached, a third reviewer (NN), will be involved to resolve the disagreement.

**Patient and public involvement**
None.

**ETHICS AND DISSEMINATION**
The protocol was submitted to Human Research Ethics Committee (HREC) at the University of Cape Town for approval. The HREC responded indicating that, as the review will involve extracting and reporting on data from published literature, there is no requirement for ethics review or approval. Results of this scoping review will be submitted to a peer-reviewed journal for publication.

The review will provide an overview of PA interventions used in health research to address levels of PA, BMI, BP, cognitive function, blood glucose levels or QoL in OP residing in SSA. Hopefully, it will be informative and help guide various stakeholders and key players in choosing
appropriate contextual interventions when working with OP and assist with standardisation of PA prescription.

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Contributors The primary reviewer is SN, the secondary reviewer is SO and the third reviewer is NN. The design of the protocol and draft of the manuscript was done by SN and NN. The review and final approval of the manuscript was done by SN, SO and NN.

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