STUDY PROTOCOL

Community-based care models for arterial hypertension management in non-pregnant adults in sub-Saharan Africa: A scoping review protocol [version 1; peer review: awaiting peer review]

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V1 First published: 21 Jun 2021, 10:487
<https://doi.org/10.12688/f1000research.51929.1>
Latest published: 21 Jun 2021, 10:487
<https://doi.org/10.12688/f1000research.51929.1>

Open Peer Review

Approval Status Awaiting Peer Review

Any reports and responses or comments on the article can be found at the end of the article.

Abstract

Introduction: Arterial hypertension (aHT) is the most important cardiovascular risk factor (CVRF) in adults living in sub-Saharan Africa (SSA), leading to an excess of cardiovascular disease (CVD) morbidity and mortality. Life-long aHT service delivery models in the region remain mostly anchored to health facilities and are provided by physicians or nurses, thus limiting access to care. Over the past years, decentralized community-based aHT care models have been piloted, aiming to improve access to prevention, diagnosis, and treatment. Although individual studies suggest that community-based care is well-received and potentially efficacious, a synthesized overview of such care models is missing. Hence, the aim of this scoping review is to map out and summarize existing interventions for community-based aHT diagnosis and care in non-pregnant adults in SSA. Additionally, we will describe outcomes in terms of acceptability, blood pressure control, patient engagement in care, and occurrence of aHT caused end-organ damage.

Methods and analysis: We will apply the Arksey and O'Malley scoping review methodology and best practice, as outlined by Levac and the Joanna Briggs Institute scoping review guidelines. The research questions have been identified through a literature review and expert consultation. A systematic literature search will be conducted in four databases using a tailored search strategy, including a supplemental

search through backward and forward citation. Abstracts and full text screening as well as the extraction of data will be conducted by two independent reviewers. Discrepancies will be resolved by a third reviewer. Information will be presented in both tabular and narrative form.

Ethics and dissemination: This scoping review will summarize findings from existing publications, rather than primary data, and as such, does not require ethics review. Findings will be disseminated through stakeholder meetings, conference presentations, websites, and a peer-reviewed publication.

Keywords

Arterial hypertension, hypertension treatment, cardiovascular disease, implementation research, community-based care, non-communicable diseases, chronic diseases, sub-Saharan Africa.

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Author roles: **González Fernández L:** Conceptualization, Data Curation, Formal Analysis, Methodology, Project Administration, Validation, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Firima E:** Conceptualization, Formal Analysis, Investigation, Methodology, Validation, Visualization, Writing – Original Draft Preparation, Writing – Review & Editing; **Huber J:** Conceptualization, Formal Analysis, Methodology, Software, Writing – Original Draft Preparation, Writing – Review & Editing; **Raeber F:** Conceptualization, Investigation, Methodology, Writing – Original Draft Preparation; **Amstutz A:** Funding Acquisition, Writing – Review & Editing; **Gupta R:** Writing – Review & Editing; **Mokhohlane J:** Writing – Review & Editing; **Belus JM:** Conceptualization, Methodology, Writing – Original Draft Preparation, Writing – Review & Editing; **Labhardt ND:** Conceptualization, Funding Acquisition, Investigation, Methodology, Project Administration, Writing – Original Draft Preparation, Writing – Review & Editing

Competing interests: No competing interests were disclosed.

Grant information: This review is funded by the TRANSFORM grant of the Swiss Agency for Development and Cooperation under the ComBaCaL project (Project no. 7F-10345.01.01), obtained by AA and NDL. EF receives his salary from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie grant agreement (No 801076), through the SSPH+ Global PhD Fellowship Programme in Public Health Sciences (GlobalP3HS) of the Swiss School of Public Health. The funder had no role in developing this protocol.

The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

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How to cite this article: González Fernández L, Firima E, Huber J *et al.* **Community-based care models for arterial hypertension management in non-pregnant adults in sub-Saharan Africa: A scoping review protocol [version 1; peer review: awaiting peer review]** F1000Research 2021, 10:487 <https://doi.org/10.12688/f1000research.51929.1>

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Background

The sub-Saharan Africa (SSA) region is experiencing an increased burden of non-communicable diseases (NCDs) linked to demographic ageing, rapid urbanization, and the expansion of unhealthy lifestyles, which include sedentarism, unhealthy diet, and tobacco consumption.^{1–4} In this region, cardiovascular diseases (CVDs) heavily contribute to the NCDs burden.^{5,6} CVDs encompass a group of disorders that include coronary heart disease, cerebrovascular disease, peripheral arterial disease, deep vein thrombosis, pulmonary embolism, rheumatic, and congenital heart disease. These conditions add more than 22.9 million disability adjusted life years (DALYs) lost in the region¹ and are a major driver of poverty at the household level in the region due to catastrophic, out-of-pocket expenditure for health care.⁷

Arterial hypertension (aHT) is the single most important cardiovascular disease risk factor (CVRF).⁸ Yet, efforts focused on the prevention and control of aHT in SSA are limited. As aHT often requires life-long treatment and follow up, patients need to access their health care providers regularly for overall CVDRF control, follow up for potential complications, medication-refill, as well as blood pressure and treatment side effects monitoring. However, these services are mostly provided by physicians, clinical officers or nurses in hospitals, health centres or peripheral clinics.^{9–13} Particularly in underserved settings or rural regions, regular attendance to health facilities may be time consuming, expensive, and become a barrier for access or long-term engagement in care.¹⁴ As a result, the aHT cascade of care, defined as awareness, uptake of treatment and adequate control, remains inadequate at individual and population levels.^{15–18}

Building on lessons learnt from the global HIV and tuberculosis epidemic responses, service delivery models that promote decentralized, task-shifted, and community-based care could catalyse broader scale-up of quality prevention, diagnosis and care for aHT and other chronic diseases in SSA.^{19–25} However, there is currently no consensus on how such community-based projects should be designed and if they are able to improve access to high quality care. Therefore, we will conduct a scoping review to describe community-based care models for aHT in SSA, with the aim to summarize the available evidence, discuss their potential for scale up services at community level and to inform future NCD programmes in SSA.

Study objectives and rationale

The primary objective of this scoping review is to describe and construct a framework for categorizing the existing community-based care models for aHT in non-pregnant adults in the sub-Saharan African region. Secondary objectives include: 1) to appraise the models of care, in terms of acceptability, blood pressure control, engagement in care, and occurrence of end-organ damage, 2) to identify gaps in the literature with respect to community-based service models for aHT, and 3) to describe within-study comparisons between community-based and facility-based models of care in terms of outcomes, if provided by authors.

The use of the scoping review methodology will allow us to compile, categorize, and describe the existing use of various community-based health care in the SSA region. It will further identify gaps and priority areas for future research. Additionally, it will provide key information to health professionals and policy makers interested in planning, funding, and delivering interventions to prevent and treat CVDs.

Despite the wide use of the term “community-based” health care models, there is no standard definition of the integrating components. Moreover, implementation of health initiatives at the level of the community in SSA is often diverse and heterogeneous. The definition used for community-based care in this scoping review is adapted pragmatically, including any care model where a substantial part of the care is provided outside formal health care facilities. We will categorize such models in three dimensions: “who provides care in the community?”, “how often is care in the community provided?” and “what kind of interventions are included in the community care?”²⁶ (Table 1).

Methods

This scoping review follows the framework proposed by Arksey and O'Malley²⁷ which has been further developed by Levac *et al.*²⁸ and the Joanna Briggs Institute.²⁹ We will undertake the following steps:

- Stage 1. Identifying the research question.
- Stage 2. Identifying relevant studies.
- Stage 3. Study selection and eligibility criteria.
- Stage 4. Charting the data.
- Stage 5. Collating, summarising, and reporting results.
- Stage 6. Stakeholder consultation.

Table 1. Community-based care components for arterial hypertension (aHT) to be summarized in this review. CVRF = cardiovascular risk factor.

Target population	<ul style="list-style-type: none"> Individuals who are newly diagnosed or already on treatment for aHT
What package of care is offered?	<p>At least one (minimum) of the following components is included:</p> <ul style="list-style-type: none"> Long-term (chronic care) aHT treatment prescription/distribution Disease monitoring for treatment success: blood pressure measure, point of care lab tests (urine, creatinine, etc.) Assessment of aHT end-organ damage categorized as: 1) vascular stroke, 2) retinopathy, 3) coronary heart disease, myocardial infarction, heart failure, 4) nephropathy, including proteinuria, albuminuria, chronic renal insufficiency, and renal failure. <p>The following elements may be part of the model and will be described:</p> <ul style="list-style-type: none"> aHT screening, diagnosis, treatment initiation Lifestyle/behavioural change counselling Adherence to medication Side effects reporting and management General education on CVRFs Smoking cessation Screening for other CVRFs Self-management Family approaches Integration with other chronic conditions (diabetes, TB, HIV, etc.) Rehabilitation Diagnosis of chronic complications Use of e-Health platforms: SMS, internet, distance support, etc.
Who provides care?	<ul style="list-style-type: none"> Any professional and non-professional cadre Physicians, non-physician clinicians, nurses, pharmacists (or similar), community health workers (or similar), peers, self-care, psychologists, social workers, or family members Traditional healers, defined as community members not providing internationally adopted guidelines for aHT care If non-professional providers: whether the project provides (or not) supervision and training from medical providers
Where is care provided?	<ul style="list-style-type: none"> Outside of the compound of a permanent health care facility. This may include, but not restricted to, the following settings: outreach services, home-based care, places used for gathering (religious centres, schools, markets, shops) or delivering other services to citizens (pharmacies, etc.). The use of e-Health interventions is also included.
How often are follow up visits?	<ul style="list-style-type: none"> Model foresees a reduction in number of patient visits to the health facility, as compared to the standard of care. Model includes task-sharing with other health cadres and/or self-care. The community component is not an “add on” to the care at the facility, but substitutes some of the patient’s contacts with health workers at the health facility.

Stage 1: Identifying the research questions

The key scoping review questions are based on a review of the literature and feedback from subject matter experts guided by the PICO (population, intervention, comparison, outcome) questions (Table 2). The overarching research question is: what kind of models for community-based care for aHT in adults have been used in SSA, and what are their effects in terms of acceptability, blood pressure control, engagement in care, and occurrence of end-organ damage?

Table 2. Scoping review PICO (population, intervention, comparison, outcome) question. Arterial hypertension = aHT.

P	Patient problem/Population	Non-pregnant adults living with aHT (known or newly diagnosed) in sub-Saharan Africa
I	Intervention	Community-based aHT care (outside formal health facilities)
C	Comparison	Comparison with facility-based aHT care if authors provide
O	Outcome(s)	Acceptability, blood pressure control, engagement in care and occurrence of end-organ damage

Additionally, six secondary research questions have been derived, within the same scope:

1. What are the main components of existing community-based aHT care models?
2. Do existing community-based aHT care models provide an opportunity to offer more user-adapted services in SSA?
3. Can existing community-based aHT care models in SSA expand access to life-long health services for CVDs?
4. How does the quality of aHT care of services provided outside health facilities compare to facility-based care?
5. Are existing community-based care models a solution to decongesting facility-based services?
6. Can non-physician, non-nurse led aHT care provide adequate long-term service quality?

Stage 2: Identifying relevant studies

Based on preliminary searches, the research team and the medical information specialists will jointly formulate the search strategy and search terms. The search strategy will utilise indexed terms and text words. The specific terms will be obtained via analysing titles and abstracts of relevant publications found through preliminary searches and entry terms of relevant indexed terms. The initial search string will be developed for **Embase** (Elsevier Interface)³⁰ and translated to search the following electronic databases: **Ovid MEDLINE**,³¹ **Cumulative Index to Nursing and Allied Health Literature (CINAHL)**,³² and **Scopus**.³³ We will not apply language limits or date restrictions for peer-reviewed reports. We will also include supplemental search methods of backward and forward citation from included studies to identify other possible articles that meet the inclusion criteria. Conference abstracts will not be considered if they have not resulted in a peer-review publication. The Embase search string is available in *Extended data*.³⁹

The search strategy is based on the combination of three concepts: the condition of interest, the components of the care model, and the geographical region (**Figure 1**). The search string was developed for scoping community-based care models for hypertension and type-2 diabetes in non-pregnant adults simultaneously. The string related to the components of the care models (“what”, “who”, “where”, “how”) included elements described in *Extended data*,³⁹ however, terms such as “health programme”, “adherence”, “medical assistance” were excluded from the string design, as they increased its complexity and the translation to other databases. The string related to the geographical component was developed based on Campbell *et al.*³⁴ and the United Nations standard country or area codes for statistical use.³⁵ Boolean operators “AND” and “OR” were used to combine search terms. “NOT” was used to exclude terms.

The search string was developed in the database **Embase** via Elsevier. Macros developed by Erasmus MC information specialists³⁶ were used to translate the search string to Medline Ovid. The tool SR-Accelerator³⁷ was used to translate the Medline Ovid search string to Scopus and CINAHL databases. As these tools only correct the syntax to let the string work

Figure 1. Overview of literature search strategy.

in the corresponding database, the thesaurus terms had to be adapted manually. Scopus was only searched via text words, as indexed keywords (index terms) are chosen by content suppliers and not uniformly applied.

Stage 3: Study selection and eligibility criteria

Search results from each database will be imported to EndNote X7 and duplicates will be removed, a similar procedure can be done using Zotero. Two independent reviewers will screen the titles and abstracts of all studies initially identified according to the selection criteria to identify relevant studies for full text review. Discrepancies will be resolved by a third reviewer. We will illustrate the study selection process in a PRISMA diagram. Details on studies inclusion and exclusion criteria are detailed in Table 3.

Stage 4: Charting the data

For studies undergoing full text review, a data extraction tool will be created in Word™ (version 2014) and piloted on a subset (n = 3) of studies to determine data validation checks to improve consistency in the data extraction. The data extraction form will include information on the author, year of publication, study design, target population, location of study, duration of follow-up, type of community-care model, health provider cadre, outcomes measured (e.g., acceptability, blood pressure control, etc.), and comparison arm if available. After refining the tool based on the pilot

Table 3. Study inclusion and exclusion criteria. Arterial hypertension = aHT.

Field	Inclusion criteria	Exclusion criteria
Population	Non-pregnant adults ≥ 18 years diagnosed for aHT Any gender	
Geographic region	sub-Saharan Africa, which includes the following countries: Angola, Benin, Botswana, Burkina Faso, Burundi, Cameroon, Central African Republic, Chad, Congo, Cote d'Ivoire, Equatorial New Guinea, Eritrea, Ethiopia, eSwatini, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Kenya, Lesotho, Liberia, Madagascar, Malawi, Mali, Mauritania, Mauritius, Mozambique, Namibia, Niger, Nigeria, Reunion, Rwanda, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Sudan (North, South), United Republic of Tanzania, Togo, Uganda, Zaire, Zambia, Zimbabwe.	Studies conducted outside the sub-Saharan region.
Intervention/ model of care and outcomes	Medical management and treatment for aHT, including health promotion strategies, self-care, and screening of complications, that differs from standard, facility-based or conventional care in terms of provider cadre, location, or frequency. Studies that report at least one of the following outcomes: <ul style="list-style-type: none"> • Acceptability • Blood pressure control • Engagement in care • End-organ damage 	Report solely about standard or conventional, facility-based model for delivering treatment. Description does not describe the main characteristics needed to define the model. Unable to provide sufficient description of at least one outcome of interest.
Sector	Services provided in the public sector through government-managed public health infrastructure or through private or non-governmental programs or facilities that serve the uninsured sector.	Services or programs for privately (commercially) insured patients.
Type of studies	Peer-reviewed studies that provide the necessary data to assess at least one of the outcomes of interest, including prospective cohort studies, case control studies, randomized controlled trials, letters to editors, and qualitative studies on the topic	Treatment guidelines, mathematical models, conference abstracts that have not resulted in a peer-reviewed publication, editorials, viewpoints, commentaries, case reports, and systematic or scoping reviews
Language	No limits	None
Study date	No limits	None

assessment, two reviewers will independently extract the data and review consensus. Data will be stored in Excel™ (version 2014). If consensus cannot be reached, a third reviewer will be involved. We will contact study authors for clarification of methods and other information, as needed. For each article, information on the characteristics of the model of care, and reported outcomes will be tabulated.

Stage 5: Collating, summarising, and reporting results

We will report the elements of this scoping review following the Preferred Reporting Items for Systematic reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) Checklist.³⁸ We will describe the available data using basic descriptive statistics and narrative synthesis. If interventions (care models) are similar, we will group results by intervention type. Similarly, where possible, we will group and comment on other common features (i.e., health care providing the service, place of delivery and frequency, use of e-Health). We will also summarize each study's outcomes, by study type. Where possible, we will pool outcomes and report average and/or median values, with associated confidence intervals. We will group the studies for features of described care models. Additionally, we will address both quantitative and qualitative gaps in the literature. We will discuss the data in the light of relevant community care models for other chronic conditions (tuberculosis, HIV, diabetes, mental health), propose suggestions for further studies and applications for programmatic scale up.

We will not assess the risk of bias in individual studies, meta-bias(es) (such as publication bias across studies, selective reporting within studies), nor describe the strength of the body of evidence (GRADE).

Stage 6: Stakeholder consultation

A group of experts in the field will be consulted in the process of summarizing results, with the aim of facilitating research translation and dissemination of any recommendations. This includes peer researchers in the same topic and global programmatic and policy stakeholders.

Study status

Currently, the search string has been designed and translated to the search databases. Literature search and deduplication of abstracts is ongoing. Abstracts screening and data abstraction is expected to follow in the following weeks.

Ethics and dissemination

This scoping review summarizes findings from existing publications. It does not involve primary data collection and, as such, does not require ethics review. The results of this review will be of use to public health and medical officials, that are working in the field of NCD care in SSA and similar settings. In that regard, findings will be disseminated through stakeholder meetings, conference presentations, websites, and a peer-reviewed publication.

Time frame

The review is expected to take approximately 9 months.

Data availability

Underlying data

No underlying data are associated with this article.

Extended data

OSF: Community-based care models for hypertension in non-pregnant adults in SSA: a scoping review. <https://doi.org/10.17605/OSF.IO/659QB>.³⁹

This project contains the following extended data:

- Sco-Review-search-string-aHT-DM-20210517.doc (Embase literature search string).

Data are available under the terms of the [Creative Commons Zero “No rights reserved” data waiver](#) (CC0 1.0 Public domain dedication).

Acknowledgments

We thank Christian Appenzeller-Herzog, information specialist at the Medical University of Basel Library, for the support in developing the search strategy, supporting databases search and the deduplication process.

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