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Systematic Review

Effectiveness of Interprofessional Care on Hypertension in Low- and Medium-income Countries of Africa

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ABSTRACT

The burden of hypertension is becoming worrisome in a resource-constrained continent like Africa. There is a dearth of information on the extent of the present use of interprofessional care in the continent, its effectiveness and factors that could limit its use. This systematic review sought to describe the extent as well as the effectiveness of the use of interprofessional care in the management of hypertension across the African regions. A comprehensive literature search was conducted on Pubmed, Google Scholar and ScienceDirect. The search covered the period from 1993 to 2023 (30 years period). This review was done in line with the guidelines set out by Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) statement. A total of 35 articles were included in the review out of which the East African region had 10 (29%), Central African 3 (9%), North African 4 (11%), Southern African 7 (20%) and West Africa 11 (31%). The assessment of team cooperation, institutional or government support, right operational environment, free inter-professional communication, cost-effectiveness in patient management and easy access to care for the patients in the articles was generally affirmative to indicate effectiveness of interprofessional care. A few cases of interprofessional conflicts were also reported. Interprofessional care of hypertension is proven to be beneficial and effective in the management of hypertension in Africa but grossly under-reported. Its use may be threatened by lack of team cooperation, occurrence of conflicts between the health workers and inadequate support from government among other factors.

Keywords: *African regions, effectiveness, hypertension, interprofessional care, review*

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INTRODUCTION

Sustained increase in blood pressure, also called hypertension has been widely reported as the most important independent risk factor for most non-communicable diseases like stroke, heart failure and chronic kidney disease (Alwan, 2011; Gafane-Matemané *et al.*, 2023). Most morbidities and mortalities due to these non-communicable diseases occur in Africa, a continent of more than 50 countries and about a billion people (Owolabi *et al.*, 2023). In Sub-Saharan Africa for example, it has been estimated that these diseases would contribute even more to the overall mortality in the region by 2030 (Mathers and Loncar, 2006; Atiim and Elliott, 2016). A recent report indicate that hypertension ranks highest among the contributors of disability-adjusted life-years in Africa (Mensah, 2013). Another report attributed this large morbidity

to diet and recent lifestyle changes to suit what is obtainable in the developed or high-income countries (Miranda *et al.*, 2008).

While there are several approaches to reduce the ever-increasing new cases of hypertension in Africa like targeted-based strategies, population-based methods, increase awareness and restriction of intake of processed foods (Carey *et al.*, 2018), one missing link is the role of interprofessional or collaborative care (IPC) in the management of hypertension. IPC according to WHO is the kind of care in which "multiple health workers from different professional backgrounds work together with patients, families, carers, and communities to deliver the highest quality of care" (WHO, 2010). A report by Omboni *et al.* (2019) showed that an inter-disciplinary collaborative care is effective and efficient for improving control of hypertension and better management of

patient's health. Another report by Isetts *et al.* (2016) highlighted how a physician-pharmacist collaborative model could significantly improve patient's health and the management of their cardiovascular disease particularly hypertension. This points to the fact that coordinated collaborative response between health workers is needed in the management of hypertension (Maher *et al.*, 2012). Interprofessional team models involving pharmacists, doctors, nurses, physiotherapists, psychologists and other health workers are not only feasible but would also give better management of the factors around hypertension care (Carter *et al.*, 2015). The world health organization (WHO) encourages initiatives that would encourage the delivery of effective and efficient health system and services (WHO, 2017).

In developed countries of the world, team management of patients with hypertension has been shown to improve access, coverage, quality and timeliness of health services and patient outcome (Pfaff *et al.*, 2014). Integrated care has also been shown to help decrease mortality, morbidity, and length of stay in the hospital (Liljas *et al.*, 2019). IPC is a patient-centered care (D'Amour *et al.*, 2005) that gives all the team members the opportunity to work together and coordinate healthcare management activities that would improve the management of hypertension especially in Africa (Bridges *et al.*, 2011; D'Amour *et al.*, 2005).

It is important to note that the assessment of the effectiveness of a collaborative care usually involve the (a) relational factors, which concerns team relationship issues of power, hierarchy, leadership, roles and (b) processes, that focus on the systematic processes of collaboration such as time, space, routines, rituals, information and communication technology, and task shifting; (c) organizational factors, like institutional structures, management processes, supports or litigation postures; and the (d) contextual factors, that relate to sociocultural, socioeconomic, and political environment of the organization (Mischo-Kelling *et al.*, 2015; Reeves *et al.*, 2014). For any team care that involve one or two of the health workers, these factors determine the kind of rapport they would have to give excellent patient-centered care especially in the management of hypertension.

While there are several reports indicating the effectiveness of IPC on hypertension in developed countries (Harris, *et al.*, 2016; Peduzzi *et al.*, 2015; Rice *et al.*, 2010; WHO, 2013); and have recommended the usefulness of the initiative in the delivery of primary (WHO, 2013) and integrated healthcare (Gaboury *et al.*, 2011), there is a dearth of report on the effectiveness of IPC in the management of hypertension in the low and medium income countries especially in Africa. This systematic review sought to describe the situation as well as evaluate the effectiveness of IPC in Africa with the hope to recommend or otherwise, the implementation of the method in the management of hypertension in Africa.

METHODS

Framework: The widely used population, intervention, comparison and outcome (PICO) framework was incorporated in the search for relevant peer-reviewed articles used for this

systematic review. A comprehensive literature search was conducted on Pubmed, Google Scholar and ScienceDirect (Carroll *et al.*, 2013). The search covered the period from 1993 to 2023 (30 years period). This review was done in line with the guidelines set out by Preferred Reporting Items for Systematic reviews and Meta-Analyses (PRISMA) statement (Moher *et al.*, 2009). While author AA carried out the comprehensive review, critical assessment of the reviewed articles was done by author UU. The discrepancies that occurred during the review and assessment processes were resolved by a second joint review and assessment by the authors.

Search criteria: Some carefully selected search terms were used to get these relevant articles. Some of these terms include "interprofessional care", OR "team care", OR "collaborative care", "multidisciplinary care", OR "integrative care", AND "high blood pressure", OR "sustained increase in blood pressure", OR "hypertension", AND "elderly population", OR "older people", AND "North Africa region", OR "Central African region", OR "West African region", OR "East African region", OR "Southern Africa region", OR "Sub-Sahara Africa", OR "African countries", OR "Low- and Middle-Income Countries". Others include "health workers", OR "physician-nurse", OR "community health workers", OR "physician-pharmacist", OR "pharmacist-nurse", OR "health workers", AND "effectiveness", OR "efficacy" OR "efficiency", OR "usefulness". We performed a forward and backwards search on Google Scholar to get additional relevant articles. This iterative approach helped to get some other published peer-reviewed articles which could not be gotten directly through the search engines.

Inclusion and exclusion criteria: At the very beginning of the online search for the articles, the criteria for inclusion and exclusions were clearly stated. This was strictly followed all through the course of the search. Some of the criteria are described in Table 1. Only full peer-reviewed articles published in English language between 1993 and 2023 (30 years period) were considered to get a broad and definite role or impact of IPC in the management of hypertension in Africa. Articles that defined hypertension as sustained increase in blood pressure above >140 mmHg for systolic and >90 mmHg for diastolic were also included. Studies that used both manual or automatic sphygmomanometer to measure blood pressure were considered and included in the study as well. Given the focus of this review on hypertension specifically, the effectiveness of the integrated care on related cardiovascular diseases were excluded. Articles on interprofessional care for communicable or infectious diseases were equally excluded. Studies that reported the effect of the collaborative care on hypertension outside of Africa were removed. Peer-reviewed articles in French, Arabic and other African languages were excluded. Other excluded studies include: studies done in animals, abstracts of articles, book of proceedings, short communications and letters to editors. With these inclusion and exclusion criteria, a total of 35 articles were included in the final review. Also, a very strict quality assessment of the selected articles was carried out using the Critical Appraisal Skills Programme (CASP) Systematic Review Checklist

(CASP, 2018; Pace *et al.*, 2012). All included studies were found to be valid and of very good quality.

After separation of the articles along the regions where the study was carried out, an excel sheet was used to extract data on the first author and the year of publication, study

design used by the researchers, country where the study was carried out, the team members and indicators of the relationship between the team as evaluated from a critical study and disaggregation of the methods, results, discussion and limitations in the articles

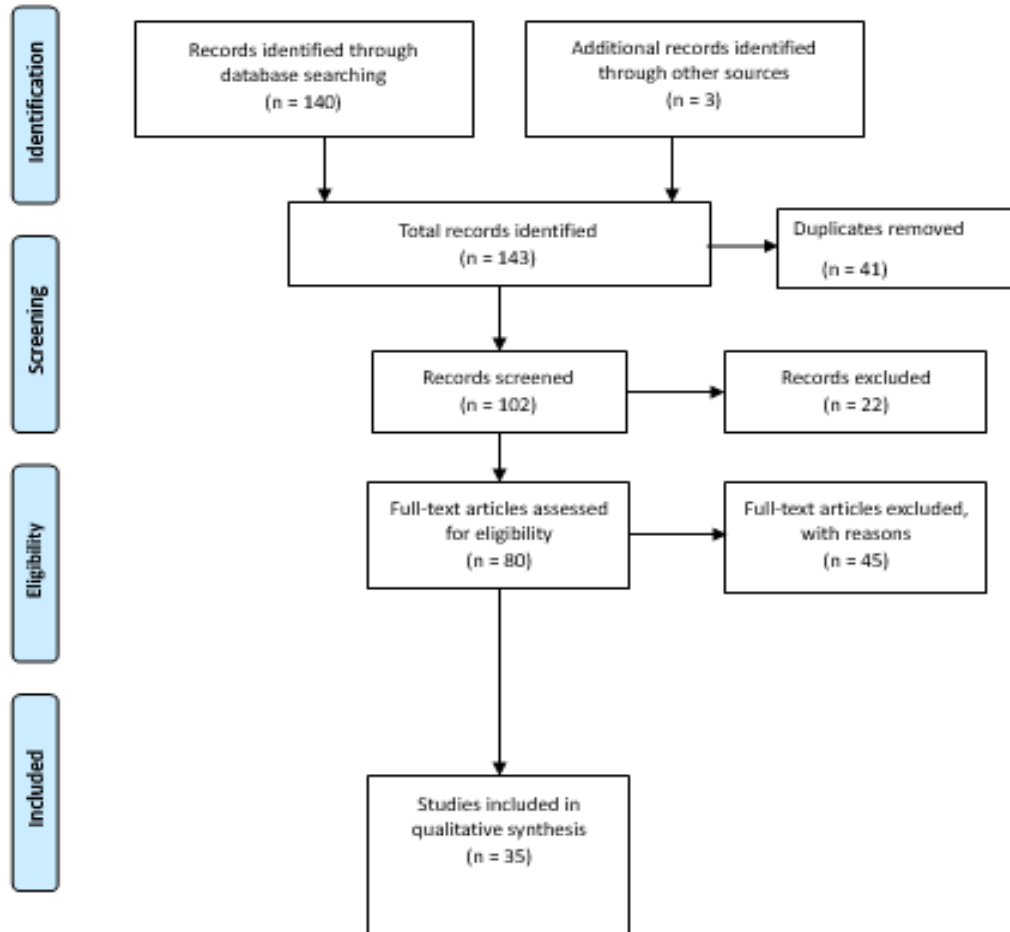


Figure 1:
PRISMA flow chart of the selection process

Table 1:
Inclusion and exclusion criteria

SN	Criteria	Population / Setting	Regions of Africa
1	Inclusion	Intervention focus Type of study design	IPC or integrative care for hypertension Full text articles, peer-reviewed articles
2	Exclusion	Nature of study	IPC for communicable diseases IPC for study outside of Africa Studies in animals Abstracts Book of proceedings Short communications Systematic reviews and meta-analysis Letters to editors

RESULTS

Outcome of the screening: As illustrated in Figure 1, the schema of the selection process of the 35 articles used for this review are shown. Through the three databases used for this search, we identified 140 articles. However, through other sources like checking of the references used in the articles downloaded, we got additional 3 articles making a total of 143 articles. Out of this total number, a total of 41 articles were found to be duplicates. This category was removed. Another 22 articles were found to be studies done outside of Africa. This category was equally excluded. After a thorough screening of the articles, another 45 articles were removed due to reports being in other languages, or studies on other related cardiovascular diseases like heart failure, metabolic syndrome, chronic kidney diseases, left ventricular hypertrophy, diabetes mellitus and other conditions.

Regional and country distribution of the articles: 10 articles (29%) of the 35 articles used for the review were from the East

African region. One article is from Tanzania, one from Ethiopia, four from Kenya, three from Uganda and one jointly from Kenya and Uganda. Central Africa was represented by three studies. One study was from Rwanda while the other two were from Cameroun. This region has the least number of studies considered for this review. The next region represented in this review is the North African region. The region had two studies from Tunisia and an international collaborative study from Algeria, Morocco, and Tunisia. This region accounted for 11% of the total number. The Southern African region had most of the studies from South Africa and just one study from Eswatini. For the West African region, 11 studies (31%) out of

the total number came from Nigeria and Ghana. One of the studies was an intercontinental study conducted in Nigeria and China. Figures 2 and 3 illustrate this country and regional representations respectively.

Assessment of individual publications and the interrelationship between the health care providers in the studies from the East African region: Altogether, there were 10 studies selected for review from the East African region. These were studies that reported the interactions between at least two health care professions

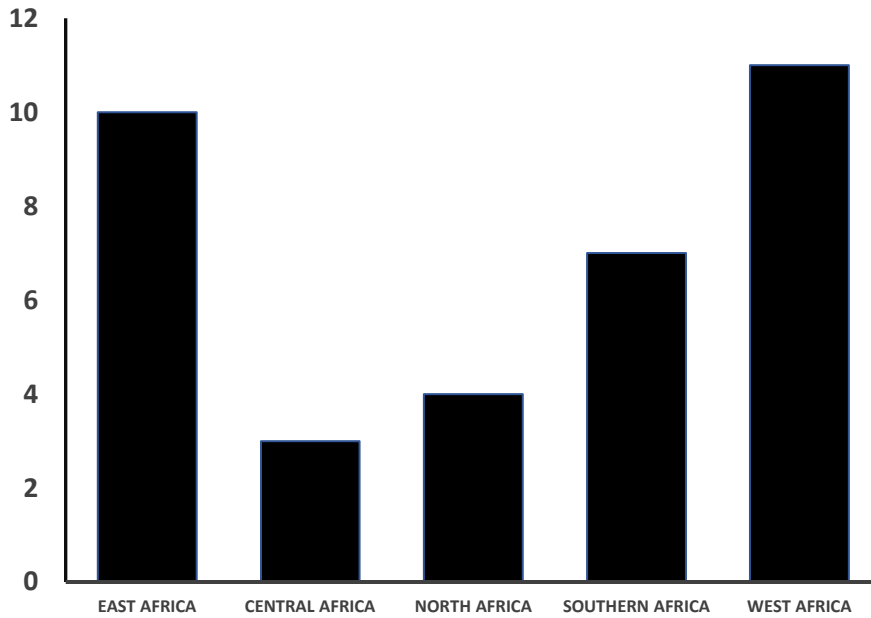


Figure 2: Number of articles from each African region

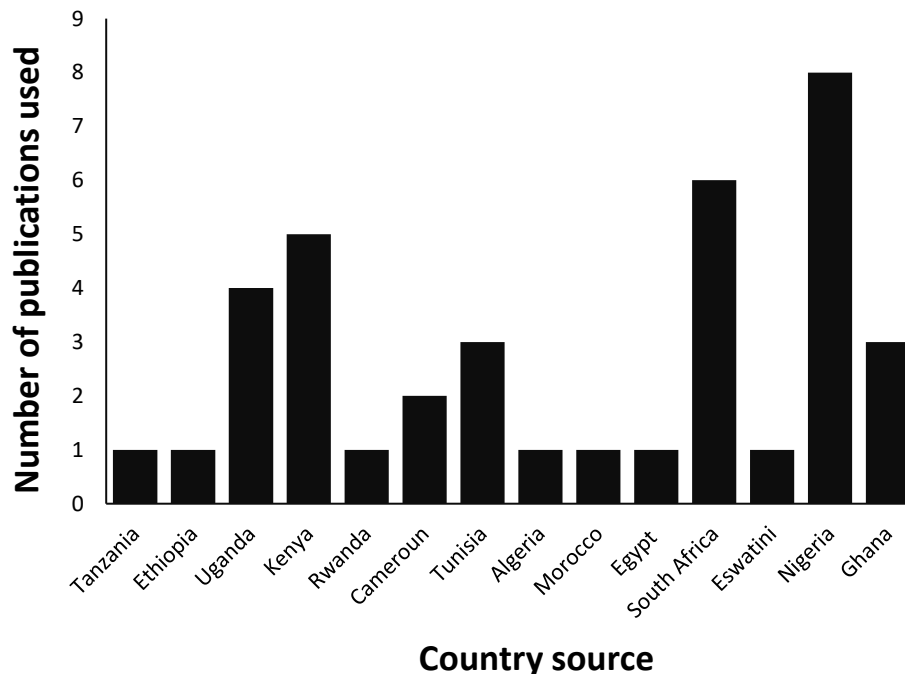


Figure 3: Number of articles from each country

Table 4:
Assessment of individual publications and the interrelationship between the health care providers in the studies from the North African region

Author, year	Method of data collection	Team cooperation	Clarity on operation	Disagreement on who to manage hypertensive patients	Institutional /government support	Operational environment	Leadership	Free communication	Cost-effectiveness	Easy access to care
(Amor <i>et al.</i> , 2021)	Screening campaign	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
(Abid <i>et al.</i> , 2022)	National observational cross-sectional multicenter study	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
(Nejjari <i>et al.</i> , 2012)	International, multicenter, epidemiological, cross-sectional study	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
(Soubra and Elba, 2023)	Cross-sectional study	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

Table 5:
Assessment of individual publications and the interrelationship between the health care providers in the studies the Southern African region

Author, year	Method of data collection	Team cooperation	Clarity on operation	Disagreement on who to manage hypertensive patients	Institutional /government support	Operational environment	Leadership	Free communication	Cost-effectiveness	Easy access to care
(Coleman <i>et al.</i> , 1998)	Lab testing and measurements in the hospital	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
(Fairall <i>et al.</i> , 2016)	Pragmatic Cluster Randomized Control Trial	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
(Morris-Paxton <i>et al.</i> , 2018)	Community health screening	Yes	Yes	No	Yes	Limited	Yes	Yes	Yes	Yes
(Rampamba <i>et al.</i> , 2019)	Operational research project with quasi-experimental design	Yes	Yes	No	Yes	Limited	Yes	Yes	Yes	Yes
Sharp <i>et al.</i> , 2020	Observational study	Yes	Yes	No	Yes	Limited	Yes	Yes	Yes	Yes
(Madela <i>et al.</i> , 2020)	Cross-sectional	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes
(Doede <i>et al.</i> , 2017)	Interview, focus group	Yes	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes

These interactions could be in the form of direct taking care of patients, lab testing, administration of questionnaires or referral to a physician for follow up. In this region, some of the methods of data collection used include population-based survey, cross-sectional survey, informant interviews and descriptive retrospective review of routinely collected clinical data. The team members were majorly clinicians, nurses and other health care workers. There was team cooperation, institutional or government support, right operational environment, free inter-professional communication, cost-effectiveness in patient management and easy access to care for the patients in all the studies except the study by Green *et al.* (2020), where there appeared to be friction between the professionals on the clarity of their operations in the management of the hypertensive patients. There was also a report from one of the professionals that the approach may not be cost effective for the patients.

Assessment of individual publications and the interrelationship between the health care providers in the studies from the Central African region: Altogether, there were just 3 studies selected for review from the Central African region. The study design was retrospective descriptive cohort design in the study from Rwanda. The other two studies from Cameroun were feasibility study and population-based epidemiological study. Just like in the East African region, the team members were majorly clinicians, nurses and other health care workers. It is worthy of note that at one of the centers, the services of specially trained non-physician clinicians were reported. There was team cooperation, institutional or government support, right operational environment, free inter-professional communication, cost-effectiveness in patient management and easy access to care for the patients in all the studies from this region.

Assessment of individual publications and the interrelationship between the health care providers in the studies from the North African region: There was an international multi-center epidemiological cross-sectional study involving Algeria, Morocco and Tunisia. The team members were primary care physicians and cardiologists. There were two other studies from Tunisia. One was just a screening campaign while the other was a national observational cross-sectional multi-center study that had cardiologists, nephrologists, endocrinologists and other specialist physicians as team members. Like the previous two regions, there was team cooperation, institutional or government support, right operational environment, free inter-professional communication, cost-effectiveness in patient management and easy access to care for the patients in all the studies from the region.

Assessment of individual publications and the interrelationship between the health care providers in the studies the Southern African region: The Southern African region had seven studies altogether selected for review. Out of this total number, only one study was from Eswatini. The other six studies were from different provinces of South Africa. In the Southern African region, some of the methods of data collection used include lab testing, randomized control trial, community health screening, operational research, observational study, interview and focus group discussions.

The team members were majorly clinicians, nurses, community health outreach workers, pharmacists, nutritionists and other health care professionals. There was equally team cooperation, institutional or government support, free inter-professional communication, cost-effectiveness in patient management and easy access to care for the patients in all the studies. Of note however is the limited operational environment that could hinder inter-professional collaboration as reported by Morris-Paxton *et al.* (2018), Rampamba *et al.* (2019) and Madela *et al.*, (2020). There wasn't any reported case of disagreement on who to manage hypertensive patients in all the studies.

Assessment of individual publications and the interrelationship between the health care providers in the studies from the West African region: Altogether, there were eleven studies (31%) selected for review from the West African region. These were studies that reported the interactions between at least two health care professions as previously mentioned. Majority of these studies were from Nigeria. There was also an intercontinental study involving Nigeria and China. In this region, some of the methods of data collection used include non-randomized studies, community screening, exploratory uncontrolled pre-post intervention study, cluster randomized designs, cohort study, mixed method case study and cluster randomized trial. The team members as we have it in the other regions were majorly pharmacists, clinicians, nurses and other health care workers. There was team cooperation, institutional or government support, right operational environment, free inter-professional communication, cost-effectiveness in patient management and easy access to care for the patients in most of the studies. However, one of the studies by Ajisegiri *et al.* 54 reported obvious lack of team cooperation, lack of clarity on modus operandi in the health system structure, in adequate government support among other factors that could strain the relationship between the health workers thereby undermining interprofessional collaboration in the management of hypertension.

Common teams by country: Figure 4 illustrates the pooled percentage distribution of healthcare professionals in the countries. Of note is the dominance of only physicians in Tanzania, Tunisia and Algeria. In these countries, majority of health care professionals that manage patients with hypertension are clinicians only. In Uganda, Kenya, and South Africa, there is a balanced mix of all the healthcare professionals involved in the management of hypertensive patients. In Cameroun and Nigeria, there appeared to be a reduction in the number of the physicians managing hypertensive patients. In Tunisia, Rwanda, Egypt, Eswatini and Ghana, other non-medical health care professionals like counsellors, community health workers, psychologists were not engaged. This shows a clear uneven distribution of health care professionals involved in the management of hypertension in the continent. The pooled percentage at regional level as illustrated in Figure 5 shows a fair representation of all the healthcare professionals in all the regions except the North Africa region where the physicians dominate medical practice and appear to be fully in charge of patients with hypertension.

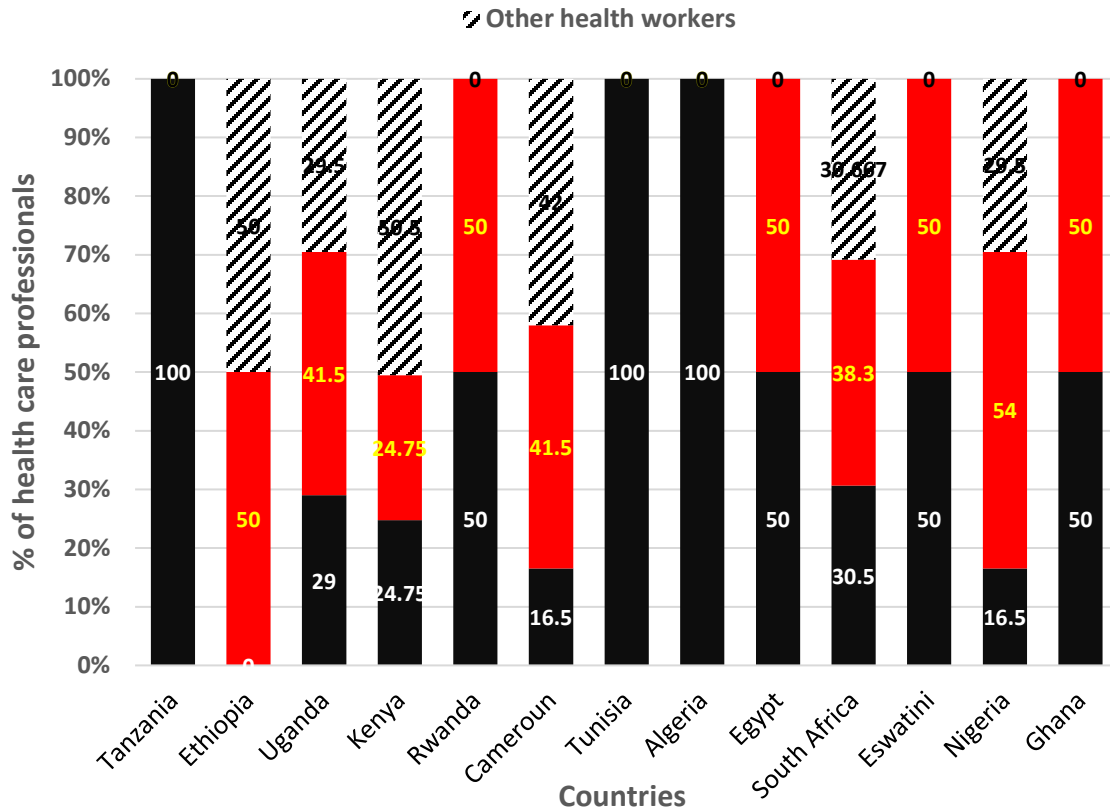


Figure 4: Percentage distribution of health care professionals in the countries

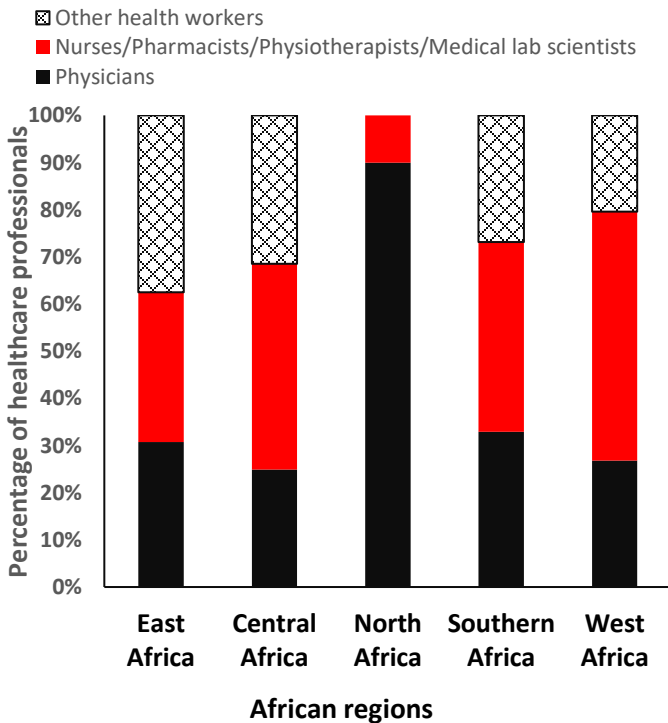


Figure 5: Percentage distribution of health care professionals in the African regions

DISCUSSION

In the African continent as a whole or the regions specifically, it appears the extent of the use of IPC in the management and care of hypertension is possibly grossly under-reported considering the eventual number of articles used for this review. Health care providers in the West African, Southern African and Eastern African regions appear to either collaborate more than their counterparts in the Northern African and Central African regions or possibly there are fewer reports from the latter. This systematic review is one of the first to make such inter-regional comparison of the situation in Africa. Another possibility however is for it not to be commonly practiced. The rivalry between physicians, pharmacists, nurses and other health professionals has been there from time immemorial (Jin *et al.*, 2014; Hashmi *et al.*, 2017).

The variables used in the assessment of the interaction between healthcare professionals in this review such as team cooperation, institutional or government support, right operational environment, free inter-professional communication, cost-effectiveness, are vital as they directly influence the outcome of such interactions between the health care workers (Supper *et al.*, 2015; van Dongen *et al.*, 2016). In this review, except in few studies, reports showed that most health workers in different regions of the continent believe team cooperation can actually improve delivery of patient care in the management of hypertension. Ansa *et al.* (2020) in line

with our observation opined that attitudes and behaviors as indicated by mutual interprofessional cooperation could have significant influence on the level or extent of interaction between health care workers. This was also the view of El-Awaisi *et al.* (2021) and Hlongwa and Rispel (2021).

Interprofessional care aims to render quality cost-effective patient-centered care, improved patient health, enhanced patient experience and improved work life of providers and staff (Wagner *et al.*, 2017) in an obviously complex healthcare system associated with the African regions (Barker and Oandasan, 2005). This explains why it's often regarded as the gold-standard approach to manage hypertension (Galletta *et al.*, 2016). This systematic review describes the current state of interprofessional collaboration in the management of hypertension in different regions of Africa. It showed that health care professionals harmoniously work together from the simple assessment of the level of team collaboration, team cooperation, institutional or government support, right operational environment, free inter-professional communication, cost-effectiveness in patient management and easy access to care for the patients. Earlier studies had shown that such collaborations lead to improvement in management outcomes of patients with hypertension (Hwang *et al.*, 2017; Useh and Akindele, 2018). To corroborate this point of view, another study by Boykin *et al.* (2018) had earlier reported the ability of such interprofessional collaborations to significantly reduce hospital readmission and improvement in the quality of care rendered to hypertensive patients. There are also reports of expanded health care benefits. There was an advocacy for the inclusion of clinical pharmacists in clinical care teams in the United States due to the observed improvement in health outcomes (Chisolm-Burns *et al.*, 2010; Doherty and Crowley, 2013). Several other reports had highlighted the ability of IPC especially between physicians, pharmacists and nurses to cause significant improvement in hypertension care (Albsoul-Younes *et al.*, 2011; Margolis *et al.*, 2013). These benefits explain why interprofessional care would not only increase job satisfaction of all team members but also reduce stress while significantly improving the quality of care to patients (Morgan *et al.*, 2015; Fiscella and McDaniel, 2018).

The study by Ajisegiri *et al.* (2022) highlighted the possible lack of collaboration between the professionals in some quarters. This is evident from the obvious lack of team cooperation, occurrence of conflicts between the health workers, rivalry of who should manage hypertensive patients and inadequate support from government. All these are factors that cannot be ruled out in an African setting. While some of the health workers might not want to disclose this fact, it represents what transpires often between the healthcare professionals. In agreement with this assertion, previous studies had reported weak communication between the health care professionals, and this was attributed to hierarchical differences (Aveling *et al.*, 2015; Wami *et al.*, 2016). Most health workers believe interprofessional collaboration could be very useful in the management of hypertension but some of them expressed concern about obvious interprofessional conflicts, rivalry, leadership tussle, lack of clarity on who to rightly manage hypertensive patients. These conflicts may be due to different interests, expectations, goals, styles and experiences of the team members (Nakata and Im, 2010). It

could also be due to arrogance (Jin *et al.*, 2014; Hashmi *et al.*, 2017), lack of adequate knowledge (Khan *et al.*, 2020a), bad government policies (Hashmi *et al.*, 2017) and inadequate training (Khan *et al.*, 2020b). To avoid these conflicts, it was recommended by Vestergaard and Nørgaard (2018) that health care professionals need to work together in an atmosphere of mutual respect and shared values. Two South African studies also indicated that interprofessional care is highly influenced by collaborative leadership style and practices (Mathole *et al.*, 2018; Hlongwa and Rispel, 2021).

The kind of subjective assessment of each study used for this review makes it difficult to decide conclusively that IPC is effective on hypertension in the African continent. It is therefore pertinent to urgently carry out a wholistic inter-regional multi-center cross-sectional assessment of the situation. Another major concern is the number of articles used for the review. It is often believed that the more the number of studies reviewed, the more the robustness of the review and its validity. Despite these limitations, this systematic review serves as an eye-opener as its findings can provide insights into the measures that could make interprofessional care of hypertension effective in Africa.

In conclusion, interprofessional care of hypertension is proven to be beneficial and effective in the management of hypertension in Africa. However, its use may be threatened by lack of team cooperation, lack of understanding of roles played by individual professions, occurrence of conflicts between the health workers, rivalry of who should manage hypertensive patients and inadequate support from government among several other factors. There would be an urgent need to carry out a more robust inter-regional multi-center studies to confirm some of the observations made in this review.

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