

# Challenges of being a researcher in Africa: A narrative synthesis of literature

Ismael Ahmed<sup>1\*</sup>, Tigest Shifraw<sup>1, 2</sup>

## Abstract

**Background:** The importance of research in the development agenda of Africa has received better recognition in recent years, with an increasing number of publications by African researchers. However, the number and quality of the research outputs are not on a par with the health problems and population size of the continent. This review was carried out with the aim of identifying the challenges researchers face in Africa.

**Materials and Methods:** We conducted a narrative synthesis of the available literature. We searched for relevant articles on PubMed, Hinari and Google Scholar databases. We searched for additional articles from the reference lists of studies identified through the search. The date of the last search was 05 April 2018. We thematically synthesized the results in terms of individual, institutional and policy challenges.

**Results:** We retrieved 610 articles, of which 12 were eligible for inclusion. Limited institutional research capacity, including a shortage of local funds, shortage of skilled researchers and weak infrastructure, were the prevailing challenges. A lack of technical capacity in scientific writing, including lack of English language writing skills, were the common individual-level challenges. A further finding was that research evidence generated in Africa was not generally used to inform the policy-making process.

**Conclusions:** The challenge for researchers in Africa is primarily the weak capacity of research institutes that are not well equipped to produce the next generation of researchers. Efforts should be made to strengthen their capacity to improve the production of skilled scientists and visibility of research work in Africa. *Ethiop. J. Health Dev.* 2019; 33(4):229-238]

**Key words:** Scientist, research, researcher, challenge, Africa, narrative, systematic review

## Introduction

Research and development plays a significant role for sustained economic growth (1). In Africa, according to the World Bank, there has been substantial increment in research conducted in the fields of science, technology, engineering and mathematics (2). Despite this improvement, there is still inadequate research capacity in Africa (3,4) to sufficiently address the continent's problems in the fields of food, security, energy, transportation, and health. This is reflected in the minimal contribution of Africa to the global share of researchers, which has not changed over the years (5). Furthermore, Africa's contribution to the share of the global scientific publications is minimal, and particularly poor among sub-Saharan African countries (6). Further investment in research and technology is urgently required to tap the best minds on the continent and to develop innovative local solutions to the numerous problems the continent is facing (7). However, increasing research capacity is a long and complex process, requiring continuous input at the individual, institutional and system-wide levels (8).

Even though there has been a considerable number of studies conducted in Africa to explore the complex challenges African researchers face, there has not been a systematic review of such articles. Therefore, this paper aims to pool and synthesize the available body of knowledge on the challenges of researchers in Africa. Such analysis can provide collective information about the common challenges in Africa and help policy-makers make informed decisions that improve research and development on the continent.

## Materials and Methods

**Review approach, data sources and searches:** The review was conducted based on the *Guidance on the*

*conduct of narrative synthesis in systematic reviews* in terms of the process of searching, identifying and extracting relevant data from articles (9). In addition, we followed the items outlined in the *Preferred reporting items for systematic reviews and meta-analyses* (PRISMA) guidelines when applicable for a narrative synthesis (10). Two reviewers independently searched articles on PubMed, Hinari and Google Scholar databases for peer-reviewed articles. The following combination of keywords was used to search literature in the databases: “researcher” OR “research” OR “scientist” OR “science” AND “challenge” AND “Africa”. Both reviewers conducted manual searches of reference lists of articles identified through the search. For example, reports on Africa's global share of researchers, scientific publications and investment in research were sought through manual searches of reference lists to augment some of the qualitative findings. Full-text articles were requested from the authors when they were not available.

**Study selection:** Literature, including peer-reviewed and some grey literature (e.g., reports), that examines challenges faced by researchers in Africa were included in the review. Literature was not excluded based on the type of study design and settings. Non-English language papers were not excluded during the initial search but excluded at the full-text review stage. All the available literature was searched, with no limit on the time period. The date of the last search was 05 April 2018.

Literature retrieved from the databases were initially screened by title and abstract, and then, where appropriate, full texts were reviewed by both authors. First, duplicate publications were removed. Following this, titles and abstracts, and then full texts, were

<sup>1\*</sup>University of Gondar, Ethiopia; Email: ismaelahmed2003@gmail.com

<sup>1,2</sup> Addis Continental Institute of Public Health, Ethiopia; Email: tigestsaciph@gmail.com

screened based on the eligibility criteria. Those deemed ineligible were removed at the different stages. Full-text articles were requested from the authors when they were not available online. The authors discussed and resolved any differences during the screening process. Literature obtained using the search strategy were uploaded to Zotero software for the purpose of collecting, organizing and managing articles.

**Data abstraction:** A predefined Excel tool was developed and used to extract data from reviewed literature. Articles which met the inclusion criteria were examined and information from each of them was collated by the first author (IA). All extracted data were checked by the second author (TS) to ensure the quality of data abstraction. Any disagreements were resolved by discussion. Relevant variables extracted from articles include first author name, publication year, study setting, research aims, research design, sample size, study participants, recruitment method, data analysis methods, and key findings.

**Quality appraisal:** The methodological quality of each article was assessed independently by both authors using the Critical Appraisal Skills Program (CASP) Qualitative Checklist (11), and any disagreements were resolved by discussion. The checklist contains 10 questions which guide researchers in reviewing qualitative studies. Nine of the questions were answered as “Yes”, “Can’t tell” or “No”. Under each item, there were guiding questions for consideration. The last (10<sup>th</sup>) question was subjective and evaluated

how valuable the study is. Studies were not excluded on the basis of quality assessment result; instead, the assessment was used to present the quality of evidence available on this topic, for discussion.

**Synthesis:** Based on the aim of this review, findings from a range of studies that varied in terms of study methodologies and settings were thematically analyzed. Since most of the articles were qualitative studies, we used a narrative synthesis to summarize the findings. Quantitative findings were used to augment qualitative findings.

## **Results**

A total of 610 studies were identified through database searches and manual searches of reference lists; 591 remained after de-duplication. Of the 591 studies, 27 articles were eligible for full-text review. After screening the full text of these articles, an additional 15 studies were excluded because of various reasons indicated in Figure 1, resulting in 12 articles for inclusion based on the criteria. In the case of four articles that we could not find the full texts for, their authors were contacted to provide full-text article, and we obtained response from only one. A summary of the search and screening results is presented in Figure 1. The methodological quality of all the eight applicable articles assessed were checked “Yes” for items 1, 2, 3, 4, and 5 (Table 1); and all of them were valuable studies to inform the current situation of research in Africa.

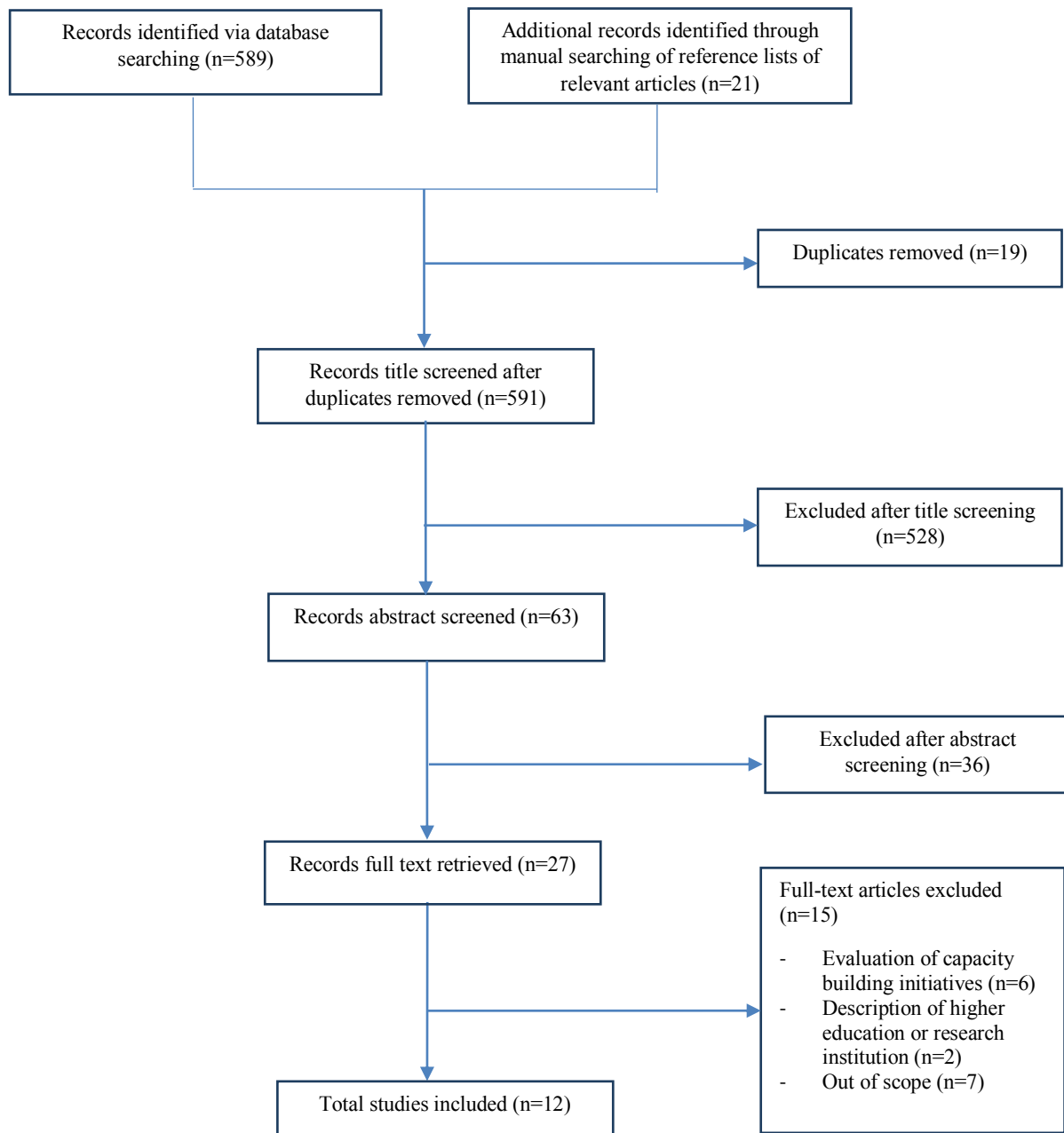


Figure 1: Flowchart illustrating the search and screening results

**Study characteristics:** The characteristics of studies included in the review are summarized in Table 1. Among the 12 studies included in the narrative synthesis, the majority (58%; n=7) employed qualitative data collection instruments (12-18). One study employed a mixed method using a survey questionnaire. Two studies used reviews of literature to discuss the current state of African higher education in the context of research capacity development (3) and to examine general characteristics of African science from a quantitative ‘scientometric’ perspective (19). The remaining two studies were UNESCO’s

quantitative reports (6,20) regarding Africa’s global share of researchers, scientific publications and investment in research and development. Even though no date restriction for the literature search was set, all but one of the studies were published between 2007 and 2018. The sample size of qualitative studies reviewed ranged from 15 to 46. Only Kumwenda *et al.* (12) and Nakanjako *et al.* (16) provided detailed information about the age and gender of participants. In these two studies, participants were age between 25 and 60 years, and approximately 65% of them were men.

Table 1: Characteristics of studies included in the narrative synthesis

No.	Author (article #)	Setting	Aims	Participants involved	Methods	Sample	Summary of key findings in thematic areas	Quality assessment using CASP (items 1-9)
1	Kumwenda S. <i>et al.</i> , 2017 (12)	Benin, Demographic Republic of Congo, Ghana, Kenya, Malawi, Nigeria, Senegal, Tanzania, Zimbabwe	To find out the challenges that young scientists face in their efforts towards contributing to development of the continent through their scientific work	Young researchers who attended the Teaching and Research in Natural Sciences for Development in Africa scientific writing and communication workshop in September 2015 in Malawi	Qualitative: semi-structured questionnaire	15	Individual: lack of skill in writing grant proposal and manuscripts  Institutional: lack of conducive environment; lack of funds; and failure to acquire grants; lack of mentorship; and other competing interest	1) Yes; 2) Yes; 3) Yes; 4) Yes; 5) Yes; 6) Yes; 7) No; 8) Can't tell; 9) Yes
2	Wight D., 2008 (15)	Kenya, Nigeria, North America, Tanzania, Uganda	To investigate the barriers to developing health social science research capacity in East Africa	Senior social scientists from Makerere University, London School of Hygiene and Tropical Medicine, University of Nairobi, Dar es Salaam University, independent research centers and research-supporting NGOs from Uganda and Kenya	Qualitative: in-depth interviews, informal conversations and group discussions	29	Individual: drain of senior researchers; limited publishing experience; and limitations in qualitative research and writing skills;  Institutional: shortage of social science research capacity; overworked social scientists; lack of collaboration between junior and senior researchers; lack of mentoring; poor university facilities; lack of research fund; and low salary scale	1) Yes; 2) Yes; 3) Yes; 4) Yes; 5) Yes; 6) Can't tell; 7) No; 8) Yes; 9) Yes
3	Sawyer A., 2004 (3)	Africa (African universities)	To discuss the current state of African higher education in the context of research capacity development and the challenges that need to be addressed in developing long-term	Literature and reports	Review of literature: Commentary based on analysis of current literature and reports	Not applicable	Institutional: inability to mentor young faculty; poor remuneration; inadequate infrastructure; under-funding of research; and heavy teaching loads	Not applicable

			knowledge generation and application					
4	Nakanjako D. <i>et al.</i> , 2011 (16)	Uganda	To evaluate the status and nature of mentoring practices at Makerere University College of Health Science	Fogarty alumni who are faculty members at Makerere University (mentors) and graduate students (mentees) registered with the Uganda Society for Health Scientists	Qualitative: self-administered questionnaires	22 mentors and nine mentees	Institutional: lack of awareness of roles of mentors and mentees; mentoring is not institutionalized and it occurs in an <i>ad hoc</i> manner; and limited number of practicing mentors	1) Yes; 2) Yes; 3) Yes; 4) Yes; 5) Yes; 6) Can't tell; 7) No; 8) Yes; 9) Yes
5	Sam-Adugu N. <i>et al.</i> , 2016 (17)	Ghana and Nigeria	To discuss strategies for scaling-up West Africa's participation in global health evidence generation using examples from Ghana and Nigeria	Academics who have served as principal investigators on research grants, global health educators, and representatives of funding institutions	Qualitative: discussion with experts	15	Individual: challenges related to publication; and lack of capacity to compete for funding  Institutional: weak research environment; limited local research fund; lack of training and conferences participation; and low number of researchers	1) Yes; 2) Yes; 3) Yes; 4) Yes; 5) Yes; 6) Can't tell; 7) No; 8) Yes; 9) Yes
6	Jones N. <i>et al.</i> , 2007 (18)	Africa	To identify: the leading donors in the field of research capacity strengthening; level and modalities of support; possible areas of duplication and omission	Published literature and research donors, and other institutions	Qualitative and review of literature: key informant interviews (KIIs); and desktop/web review of grey and published literature	20 KIIs	Institutional: African universities are very fragile; they are largely dependent on donor funding and government goodwill	1) Yes; 2) Yes; 3) Yes; 4) Yes; 5) Yes; 6) Can't tell; 7) No; 8) Yes; 9) Yes
7	Tetty W., 2010 (5)	Ghana, Kenya, Mozambique, Nigeria, South Africa, Tanzania and Uganda	To analyze the staffing of universities and examine their ability to bring forth the next generation of academics as a way to reverse the decline	Vice-Chancellors and heads of national tertiary educational bodies	Mixed method using survey questionnaire	15 African universities	Individual: dropout of postgraduates. Institutional: shortage of staff; difficulty of replenishing academic staff; postgraduate training is not producing sufficient numbers of future academics; and shortage of mentors	1) Yes; 2) Yes; 3) Yes; 4) Yes; 5) Yes; 6) Can't tell; 7) No; 8) Yes; 9) Yes

8	UNESCO, 2017 (20)	Global (report by country)	Not indicated	Not indicated	Not indicated	Not indicated	Institutional: low Gross Domestic Expenditure on Research and Development (GERD) as percentage of GDP from 2010 to 2016	Not applicable
9	UNESCO, 2015 (6)	Global (report by country)	Not indicated	Not indicated	Not indicated	Not indicated	Institutional: low African share of the global researchers from 2007 to 2013 and share of the global scientific publications in 2008 and 2014	Not applicable
10	Tijssen R., 2007 (19)	Africa	To examine general characteristics of African science from a quantitative 'scientometric' perspective	Research outputs of Africa-based authors published in the scientific literature between 1980 and 2004	Review of peer-reviewed scholarly and professional journals for their citation indexes	Not applicable	Individual: decreasing trends of publication  Institutional: lack of resources; poor working environments; low pay; lack of infrastructure, equipment and career prospects; low degree of visibility and impact of African science; and African journals are not citation indexed	Not applicable
11	Uzochukwu B, <i>et al.</i> , 2016 (13)	Nigeria	To document the experiences of a research group in a Nigerian university in engaging policy makers to support evidence informed policy making	Policy-makers in various organizations and researchers from the universities and research institutes	In-depth interview	Nine policy-makers and six researchers	Institutional: limited research funding and resistance to change  Policy: policy-makers hardly appreciate the importance of research evidence and lack the skills to do so; communication gap between researchers, donors and policy-makers; and lack of willingness of some policy-makers to use research	1) Yes; 2) Yes; 3) Yes; 4) Yes; 5) Yes; 6) Can't tell; 7) Yes; 8) Yes; 9) Yes
12	Naude C. <i>et al.</i> , 2015 (14)	South Africa and Cameroon	To understand the policy-making process and how research evidence may contribute	Subnational (provincial and regional) government health program managers	In-depth interviews and focus group discussions (FGDs)	10 interviewees and 46 participants in FGDs	Policy: research evidence is not considered the main driver of policy decisions; the evidence from different research papers is often conflicting; research evidence is often unavailable, inaccessible or not applicable or timeous	1) Yes; 2) Yes; 3) Yes; 4) Yes; 5) Yes; 6) Can't tell; 7) Yes; 8) Yes; 9) Yes

**Findings on the challenges of researchers in Africa:**

The challenges reviewed from the literature were summarized into three major thematic areas for ease of understanding, even though they are not mutually exclusive: challenges related to individuals, institutes and policy.

**A. Individual challenges****1. Publication**

Publication by Africans has been one of the areas explored through quantitative and qualitative methods that are related to both individual- and institutional-level capacities. Publishing, especially in a peer-reviewed journal, is the major challenge faced by researchers in Africa (12,15,19). Africa's citation impact scores are significantly below the worldwide average, which has resulted in a low degree of visibility and impact of African perspectives within the international scientific community. Many African scientists publish infrequently or in local science journals that are not accessible through frequently used electronic databases (19). In 2014, Africa contributed a 2.6% share of the global scientific publications; 1.4% of the share is from sub-Saharan African countries (6). Reviewed literature indicate a lack of capacity in scientific writing (12,15) and payment for publication in high-impact journals (17) as challenges related to African researchers not publishing in internationally accessed journals. This is described by respondents from Nigeria and Kenya:

*"In my country... lack of expertise in preparing manuscripts for publication are major setbacks for researchers..."* (Female respondent, Nigeria) (12)

*"... in terms of publishing, the main challenge is to know what to include in the paper from the research work."* (Female respondent, Kenya) (12)

Furthermore, Kumwenda *et al.* reported a lack of English language writing skills as one of the problems for publication (12). This is illustrated in the following quotation:

*"I also have problems in writing in English than in French. This puts me at a disadvantage when I want to publish in English journals. Also, the fees for language experts to proofread your manuscripts are very high."* (Male respondent, Senegal) (12)

On the other hand, researchers' access to on-the-job training in the area of scientific writing skills (e.g., grant proposal and manuscript writing) is reported to be limited (12).

**B. Institutional challenges****1. Institutional capacity**

Limited institutional research capacity has been highlighted by some authors as one of the critical challenges in Africa. Sawyerr and Sam-Adugu *et al.* identified that universities and research institutions are not well-resourced in terms of human power and infrastructure (e.g., equipment, laboratories.) (3,17). Similarly, a study conducted by Tijssen to assess Africa's contribution to the worldwide research

literature indicated that many researchers in Africa suffer from poor working environments and lack of equipment (19).

**2. Research grants**

Challenges related to research funding in Africa were explored qualitatively and quantitatively. A shortage of local funds allocated by universities or research institutes for research and research capacity building is one of the barriers for African scientists (3,12,13,15,17). In 2015, sub-Saharan African countries' research and development budget was about 0.4% of the gross domestic product (20). Thus, most research in Africa is funded by foreign donors (3,17,18) who have a control over the selection of research areas (15). Literature that focuses on social science research in East Africa highlighted that most projects are funded by donors who have an already determined external priorities (15,17). This is illustrated in the following quotation:

*"Most African universities are very fragile: they are largely dependent on donor funding and government goodwill. In this kind of situation, there is no stability over time and little opportunity to accumulate intellectual capital..."* (Key informant, Centre for Research on Science and Technology, South Africa) (18)

On the other hand, there is tough competition for young scientists to win a research grant in Africa (12). This can be seen in the following quotations from Kenya and Senegal:

*"The main challenges here are lack of funds to young researchers ...."* (Female respondent, Kenya) (12)

*"The main challenge I face as a young researcher is that most research grants require a lot of experience, and my application is not considered. They favor senior researchers..."* (Male respondent, Senegal) (12)

**3. Human resource**

A shortage of skilled researchers is found to be a common issue in African universities (5,15,17). UNESCO's science report revealed that Africa's share of global researchers did not change significantly from 2007 to 2013 (2.3% and 2.4%, respectively). Sub-Saharan African countries contributed 1.1% of the world's share of researchers in 2013 (6). In line with this, the issue of low salaries in African universities is reported to be the cause of senior researchers leaving the academic environment (15) or migrating to industrialized countries (19).

**4. Competing interests**

Even though competing interests can be explained as an individual-level factor, it is mainly explained as an institutional-level challenge. For instance, researchers in East Africa are busy with consultancy work that accounts for most of their effort and leaves little time for academic teaching, mentoring and supervision of

research activities (15). This is exemplified in the following quotation from the study:

*"... in Makerere you can spend your entire time just working on very well paid, short-term consultancy studies for NGOs, ... who want something done in three weeks and will pay you very well ..."* (Senior researcher, previously Uganda) (15)

This study indicated that, even though consultancy should not interfere with normal academic work, it is difficult for program managers to enforce (15). The challenges of department heads in this regard can be seen in the following quotation:

*"He will leave you. And who loses? This is the person you have trained up to PhD level, and now he is leaving you, and you have no one to teach ..."* (Head of department, Tanzania) (15)

On the other hand, most of the literature reviewed cite the absence of senior researchers who serve as mentors as a common challenge for young African researchers. Due to the limited number of senior researchers and their competing interests, it is challenging for junior researchers to access mentors in their lifetime (3,5,12,15-17). This is exemplified in the quotation from Kumwenda *et al.*'s study:

*"Most senior researchers in Africa are too busy and do not have time to mentor the young ones. Most of them do not contribute enough if selected to be co-authors. This does not help the young scientists who aspire to publish in high impact journals."* (Male respondent, Zimbabwe) (12)

### C. Policy-related challenges

#### 1. Research and policy environment

Studies conducted in Nigeria (13), Cameroon and South Africa (14) indicated that policy decisions are not informed by evidence generated through research. In South Africa, policy-makers highlighted that they do not have time to search for evidence due to their workloads. Furthermore, for policy-makers, research is often inaccessible, difficult and time-consuming to search for and read (14). In Nigeria, policy-makers were described as not willing to use research findings and hardly able to understand the importance of research evidence to make informed decisions. The communication gap among researchers, donors and policy-makers may be one of contributors to a lack of research utilization (13). On the other hand, policy-makers in Cameroon described concern about the reliability of evidence, citing conflicting evidence from different research papers (14). The following quotations exemplify the challenges related to evidence use for policy-making:

*"One gets the impression that research is not a priority in the Ministry of Health...One year ago, we thought there was a positive move, with the creation of the documentation center...but the center seems to be a stillbirth...nothing has really changed."* (Policymaker, Cameroon) (14)

*"One of the problems of demanding evidence and uptake of results is that the policy-makers hardly appreciate the importance of this and*

*they simply lack the skills to do so. They don't even know whom to turn to if they need information to underpin a policy decision..."* (Researcher, Lagos State, Nigeria) (13)

### Discussion

This synthesis identified a range of challenges faced by researchers in Africa. The review summarized the challenges in terms of individual, institutional, and policy aspects in Africa. Highlighted challenges include limitations related to the capacity of research institutes, availability and accessibility of research grants, availability of competent and skilled researchers, hurdles in disseminating research findings, and utilization of research findings for policy-making. These factors have affected the quality and quantity of research work in Africa, leading to inadequate research capacity on the continent.

Universities and research institutions in Africa are not well-equipped in terms of skilled human resources and infrastructure, including equipment and research laboratories (3,17,19). Since scientific institutions are the foundation for research and development, the inadequate capacity of these institutions could have an effect on the production of highly skilled scientists and high-quality research work in Africa. Furthermore, a shortage of local funds for research and research capacity building were identified as the common barriers to research in Africa (3,12,13,15,17). Minimal and poorly sustained local research funding opportunities (17,21) also contribute to tough competition for research grants by Africans (12). As a result, Africa produces a small proportion of the world's investment in research and development (20).

A shortage of skilled researchers in universities has been a major contributor to the weak research capacity in Africa (6,15,17). As indicated in UNESCO's science report, Africa's share of global researchers has consistently been limited over the years (5). In line with this, the available skilled researchers in Africa are overwhelmed with personal consultancy work that pays better. This leaves senior researchers with little time for academic work, including teaching, mentoring and supervising, which could have benefited upcoming researchers. This is likely due to the low salary levels in African universities, which could be a push factor for senior researchers to invest much of their time generating additional income or to leave the academic environment completely (15,19). Though mentoring is an effective form of on-the-job research capacity development (3) for junior researchers, a lack of senior mentors who can supervise and coach younger ones has its own impact in building the capacity of the next generation of researchers in Africa (21). Apart from mentorship, in-service training is the other way of building the capacity of researchers. However, researchers in Africa have limited access to on-the-job training in the area of scientific writing skills.

Disseminating research findings is one of the main outcomes of a research process. However, this has been a challenge for African scientists, especially in terms of publishing in peer-reviewed journals (19). Unless



research results are reviewed and communicated, the researcher is not contributing to the generation of new knowledge in the global scientific community. This is exemplified by the low contribution of Africa to the global share of scientific publications, which is particularly poor in sub-Saharan African countries (5,19). Despite the challenges of research in Africa discussed earlier, one of the factors for limited and inconsistent scientific publications from Africa could be a lack of capacity in scientific writing skills (12,15). Furthermore, since the English language is the predominant publication language for the international scientific audience (22-24), costly proofreading services exacerbate the problem for researchers for whom English is not their first language. Writing in clear and comprehensible language is a prerequisite to publish in high-impact factor journals, which is a barrier many non-English speaking scientists have to overcome (24).

The ultimate use of evidence generated through research is to make informed decisions in terms of policy formation and program implementation. According to Hanney *et al.*, research can make a contribution to at least three phases of the policy-making process: agenda setting, policy formulation, and implementation (25). However, in Africa, policy decisions are not informed by evidence generated through research. This could be due to a lack of capacity to translate evidence into policies and strategies. Furthermore, policy-makers may be overwhelmed with other political priorities and lack the time to look for evidence (14).

#### Limitations of this study

This review has some limitations. First, this review summarized papers that were published to address issues related to researchers in Africa from a wide range of perspectives. Because of this, there were differences in the objectives, methods, setting, and study participants among the papers reviewed. For example, of the two exploratory studies conducted with a small sample size, one focused on young scientists (12) and the other on specific groups of scientists (social scientists) (15). Given all these limitations, it may not be possible to widely generalize the findings to the continent as a whole. Second, conference abstracts and articles that were not written in English were excluded from this review. This could have contributed to missed challenges described in other languages. Third, limited database utilization, and the initial search limited to title and abstracts only, may have contributed to missing relevant articles.

#### Conclusions

This review revealed that individual, institutional, and policy-related challenges have limited the potential contributions of researchers from Africa. As a result, participation in research and research outputs are the lowest in Africa compared to other continents. Since these challenges are foundational, efforts to strengthen the capacity of universities and research centers should be a priority. Establishing global research collaborations and partnerships that recognize the potential of researchers could improve the institutional

capacity of universities and research institutes in Africa in terms of human, finance and infrastructure.

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