



# Profiling African Health Journals: A Bibliometric Study

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**Objectives:** This study aimed to map out African health journals using publicly-available information on major databases.

**Methods:** The authors searched the African Journals Online Library (AJOL) and Scientific Journal Rankings (SJR) databases from their inception in 1998 and 1996 respectively to 17 October 2020, and identified African health journals. The authors extracted data on journal scope, PubMed indexation, open-access status, publishing fees, Journal Publishing Practices and Standards rating and bibliometrics. The data were compared with health journals from other regions using the Chi-square test and odds ratio.

**Results:** AJOL had 173 health journals registered on its database. One hundred (57.8%) journals were actively publishing. Fifty-seven (32.9%) had a 1-star Journal Publishing Practices and Standards rating and 4 (2.3%) had 2-star ratings. 112 (64.7%) had no star rating. The journal scope spanned all aspects of health. Few health journals were PubMed ( $n = 20$ ) or SJR ( $n = 22$ ) indexed. On average, African journals had lower total publications (median [IQR]: 52.0 [29.0–74.8] vs. 140.0 [75.8–272.5]), total references (55.0 [19.5–74.8] vs. 160.0 [42.0–519.8]), and H-index (12.2 [5.0–14.0] vs. 39.1 [10.0–53.0]) ( $P=0.01$ ) compared to other regions.

**Conclusion:** African health journals face unique challenges that require targeted interventions.

**Keywords:** research, Africa, PubMed indexation, open-access, PubMed, African health, journal scope, bibliometric study

## INTRODUCTION

Historically, low- and middle-income countries have lagged behind high-income countries in terms of scholarly output, and this is particularly true of African countries [1]. Thirty-one of the world's 193 countries produce 97.5% of the world's most cited papers, and South Africa, at number 29, is the only sub-Saharan African country on this list [2]. The low research output in the region has spurred

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calls for an identification of barriers to research innovation and productivity [3]. Africa has the lowest researcher density globally with less than 200 researchers per one million inhabitants; a number far removed from the 4,000 researchers per one million in the United Kingdom (UK) and United States of America (USA) [4]. African researchers equally lack funding—no African country has met the African Union target of spending 1% of the gross domestic product on research and development [5]. African researchers face other challenges including inadequate career development plans, lack of institutional support, little cross-disciplinary/-institutional collaboration, and limited involvement of students and early-career researchers in basic and translational research [6–8]. Mindful of these challenges, some African academics have suggested context-specific interventions such as the design and implementation of research-friendly policies to improve the quality and quantity of African research [9]. One of these policy interventions includes the creation of African journals and support of existing journals. Many African academics have explored collaborations with high-income countries, however, there is a tendency for African academics to receive less prominent first or last author positions in papers [10] or to be mainly data collectors and less likely to be research initiators and developers.

This study aimed to identify and characterize African health journals listed on the largest African journal repository—African Journal Online (AJOL) and to compare bibliometric data with health journals from other regions using the Scientific Journals Rankings (SJR) database. SJR was chosen because it curates and computes bibliometric data, unlike AJOL. The data from this study should help confirm the hypotheses that access to most health journals registered on the African Journals Online database was limited and that African health journals have lower H-indices than journals from other regions. Also, the study findings should inform interventions aiming to support the growth of African health journals.

## METHODS

### Hypothesis

We hypothesized that access to most health journals registered on the African Journals Online database was limited. We defined limited access as not being PubMed indexed, being discontinued, or not being open access. We equally hypothesized that African health journals have lower H-indices than journals from other regions.

### Search Strategy, Data Sources, and Data Extraction

To test the first hypothesis, we searched the African Journals Online Library for health journals from its inception in May 1998 to 17 October 2021. We filtered the search by category, narrowing it down to health journals. The first and second authors extracted data on all 173 health journals independently into a standardized Excel spreadsheet

(Microsoft Corp. WA, United States). In keeping with the principles of open data, the study data has been uploaded to the Open Science Framework (<https://doi.org/10.17605/OSF.IO/7R3XV>). African Journals Online Library was selected as it is a single database that has the highest collection of African journals, with included journals published in either the English or French language and with each journal being scholarly in content, containing original research and an established publishing track record [11].

The data extracted included the journal name, current issue date, scope or specialty, and Journal Publishing Practices and Standards (JPPS) star rating [12]. The JPPS star rating is a framework developed jointly by the African Journals Online Library and the International Network for the Availability of Scientific Publications and has four star ratings: no star (journals that do not meet 1 star criteria), 1 star (journals that have complied with the JPPS basic criteria for at least 2 years), 2 stars (journals that meet the one star and publishing practice quality criteria), and 3 stars (journals that meet 1 and 2 stars criteria for 3 years as well as other JPPS criteria) [11]. Next, we searched journal-title ISO4 abbreviations using Google Search (Google Inc., CA, United States) and used the abbreviations to search PubMed. The journal search on PubMed was composed of the MeSH query for journals and the journal abbreviation. In addition, we searched the Directory of Open Access Journals (DOAJ) to assert each journal's open access status. The journal landing pages were equally accessed to verify the data collected from the previous databases. When there was a discrepancy between one of the previous databases and the journal site, we used the journal site data. Data on all eligible journals were extracted independently by two authors (OO and ADT) and conflicts were resolved between the authors.

To test the second hypothesis, we searched the SJR database from inception in 1996 to 17 October 2021 and gathered metadata on health journals worldwide. The SJR database was selected as it is a publicly available portal with journal and country scientific indicators developed from information on the Scopus database [13].

### Inclusion and Exclusion Criteria

We included journals that had health focus as their primary scope and this was determined based on the journal's aims and scope, "about the journal" page, or published articles. When published articles were used to determine scope we only included a journal if more than 50% of articles in its last 3 years were health-related. All health journals were included irrespective of their specialty or health field. Journals that did not specify the location of their headquarters were excluded.

### Data Analysis

Quantitative and qualitative data were described using summary descriptive analyses. In addition, the odds of PubMed indexation and open access publication were computed. The bibliometric metadata of journals published within the last 3 years—2019, 2020 and 2021, were aggregated by regions and compared using Jamovi freeware v. 2.0. Two scenarios were explored: Africa vs. the rest of the world (ROW) and Africa vs. individual

**TABLE 1** | Headquarter countries of health journal indexed in the African Journals Online Library (Source: African Journals Online Library; Assessment date: 17 October 2021) (Africa, 2021).

Country	Frequency (%) before excluding inactive journals	Frequency (%) after excluding inactive journals
Nigeria	94 (54.3)	56 (32.4)
South Africa	24 (13.9)	21 (12.1)
Kenya	10 (5.8)	6 (3.5)
Egypt	8 (4.6)	5 (2.9)
Tanzania	6 (3.5)	2 (1.2)
Ethiopia	4 (2.3)	3 (1.7)
Cameroon	3 (1.7)	2 (1.2)
Rwanda	3 (1.7)	2 (1.2)
Sudan	3 (1.7)	1 (0.6)
Ghana	2 (1.2)	2 (1.2)
Mauritius	2 (1.2)	2 (1.2)
Uganda	2 (1.2)	2 (1.2)
Burkina Faso	1 (0.6)	1 (0.6)
Burundi	1 (0.6)	1 (0.6)
Democratic Republic of Congo	1 (0.6)	1 (0.6)
Eritrea	1 (0.6)	0
Libya	1 (0.6)	1 (0.6)
Malawi	1 (0.6)	1 (0.6)
Sierra Leone	1 (0.6)	1 (0.6)
South Sudan	1 (0.6)	1 (0.6)
Tunisia	1 (0.6)	0
Zambia	1 (0.6)	1 (0.6)
Zimbabwe	1 (0.6)	1 (0.6)
France <sup>a</sup>	1 (0.6)	1 (0.6)

<sup>a</sup>Headquarters outside Africa (This journal was included as it is owned by the Pan-African Association of Neurological Sciences, and its editorial board is composed of mainly Africans).

regions—Asiatic region, Eastern Europe, Latin America, Middle East, Northern America, Pacific region, Western Europe.

## RESULTS

The AJOL search returned 173 African health journals results (**Supplementary Table S1**).

### Country of Publication and Rating

22 countries out of 54 African countries had at least one health journal listed on AJOL. The most popular journal headquarters were Nigeria ( $n = 94$ , 54.3%), South Africa ( $n = 24$ , 13.9%), and Kenya ( $n = 10$ , 5.8%) (**Table 1**). The African Journal of Neurological Sciences had its headquarters in France. Clinics in Mother and Child Health was listed by AJOL as having its editorial office in Cameroon; however, the journal site listed the editorial office location as Spain. Also, its editorial board was almost exclusively non-African. Half a dozen journals with editorial offices in Nigeria contracted publishing to Indian companies.

Most journals had no JPPS star rating ( $n = 112$ , 64.7%), 57 (50.0%) had a 1-star JPPS rating, and 4 (3.5%) had 2-star ratings.

### Journal Scope

The scope of the health journals listed on AJOL varied from the basic medical sciences to the core disciplines of clinical practice and public health. The different journal scopes are outlined in **Supplementary File S1**.

### PubMed Indexation, Open Access, and Article Processing Charges

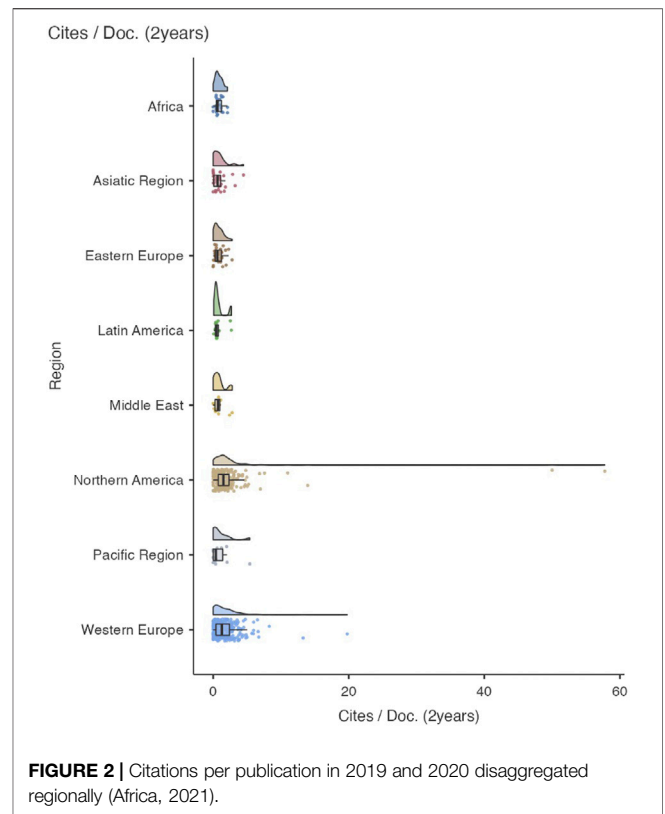
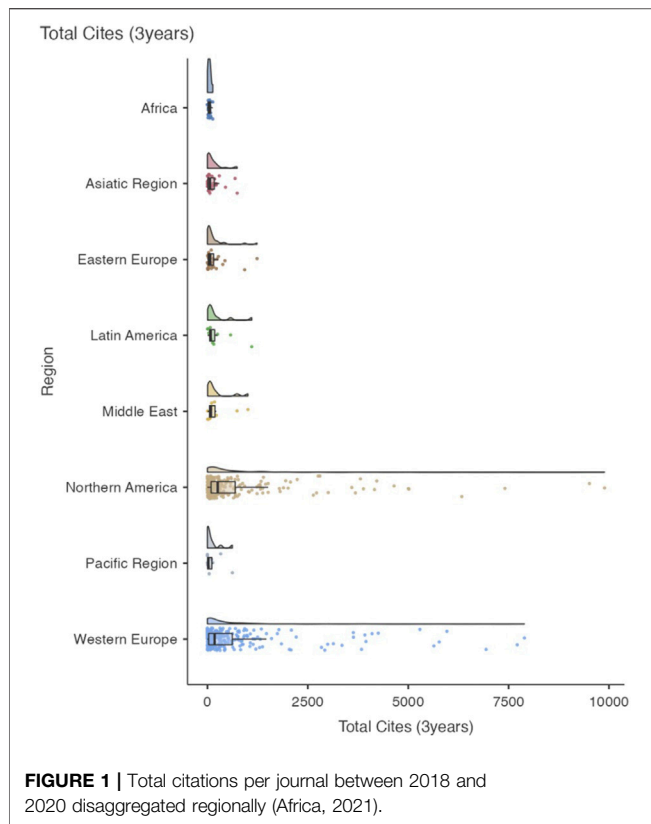
Most journals were not PubMed indexed ( $n = 153$ , 88.4%). PubMed indexed journals had their editorial offices in Nigeria ( $n = 10$ ), South Africa ( $n = 4$ ), Ethiopia ( $n = 1$ ), Ghana ( $n = 1$ ), Kenya ( $n = 1$ ), Tanzania ( $n = 1$ ), Uganda ( $n = 1$ ), and Zambia ( $n = 1$ ). Of the PubMed indexed journals, two had 2 JSPP stars, 14 had 1 star, and 4 had no star.

Seventy-nine journals (45.7%) were open access according to AJOL. Out of these, 50 (43.9%) were open access but were not listed on DOAJ, 28 (24.6%) were open access and listed on DOAJ, and one journal (0.9%) offered hybrid access. PubMed indexed journals were more likely to be open access (OR=10.98, 95% CI [2.99, 40.26],  $p < 0.001$ ).

Seventeen health journals on AJOL (9.8%) had no publication charges and one journal, Port Harcourt Medical Journal, had no publication charge for Indian authors but charged African authors \$150 as foreigners. The Annals of Medical and Health Sciences Research and the Journal of Basic and Clinical Reproductive Sciences charged the highest fee (\$2200). There was no information on the article processing charges for 47 journals (27.2%). Of note, seven of these journals were PubMed indexed.

### Discrepancies

One hundred and fourteen (65.9%) journals were classified as inactive on AJOL; however, after cross-checking the journal websites the authors found information suggesting fewer

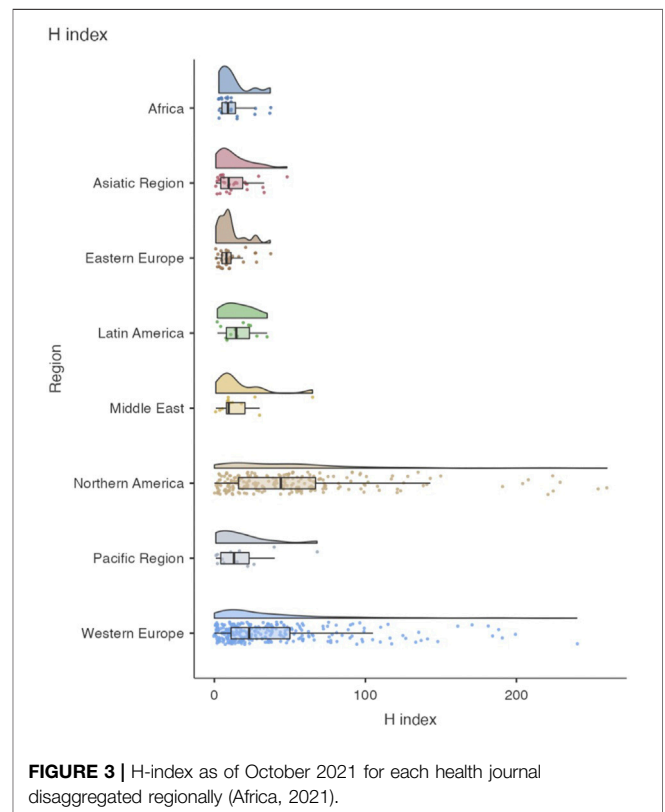


journals were inactive ( $n = 73$ , 42.2%). For example, although AJOL listed the latest publication of Clinics in Mother and Child Health as 2012, the latest publication available on the journal website had been published in 2021. The journal websites listed last publications as 2021 ( $n = 70$ , 40.5%), 2020 ( $n = 18$ , 10.4%), and 2019 ( $n = 12$ , 6.9%). Journals with publications in the past 3 years were considered to be actively publishing because data from the last 3 years are used to compute bibliometrics. Hence, 100 journals were included in the bibliometric analysis.

There was also a discrepancy in the journal open-access status. Twelve (60.0%) of the PubMed indexed journals were open access but not DOAJ indexed while five (25.0%) were open access and DOAJ listed, and three (15.0%) were not open access.

### Bibliometrics

Less than a quarter of actively publishing African health journals identified on AJOL were registered on SJR ( $n = 22$ , 22.0%). Africa had fewer health journals on SJR than Western Europe ( $n = 275$ ), North America ( $n = 210$ ), Eastern Europe ( $n = 33$ ), and Asia ( $n = 30$ ). Latin America, the Middle East, and the Western Pacific had 12 journals each. Africa had lower bibliometrics than the ROW ( $p < 0.01$ ): total publications in the past 3 years (median [IQR]: 52.0 [29.0–74.8] vs. 140.0 [75.8–272.5]), citable publications in the past 3 years (median [IQR]: 52.0 [28.8–73.5] vs. 126.5 [68.8–241.0]), total references in the past 3 years (median [IQR]: 55.0 [19.5–74.8] vs. 160.0 [42.0–519.8]), and H-index (median [IQR]: 12.2 [5.0–14.0] vs. 39.1 [10.0–53.0]). The total publications are the total number of published articles



within the period under review. The disaggregated data confirmed that on average, Africa was outperformed by most regions ( $p < 0.001$ ) (Figures 1–3).

## DISCUSSION

AJOL has the largest single database of African health journals among the major bibliometric databases. In this study, the authors assessed the scope, open access status, adherence to journal publishing practices and standards, PubMed indexation, and article publication charges for African health journals. African health journals are concentrated around three hubs—Nigeria in Western Africa, South Africa in Southern Africa, and Kenya in Eastern Africa. The majority of these journals are not PubMed indexed and data discrepancies expose the journals to lower reputation. Many legitimate African health journals do not meet rigorous editorial practices and there is evidence that this might be due to limited access to resources. Efforts targeted towards funding and building capacity within African research institutions should be prioritized.

This study assessed the landscape of African health journals by analysing major databases. The database discrepancies confirm anecdotal evidence suggesting it is difficult to understand the African health research landscape based on a single source. The use of multiple sources to triangulate data helped paint a clearer picture of the African health journal ecosystem. The study findings suggest African journals face significant challenges. First, a significant proportion of African health journals have not published an issue in the past 3 years. This finding suggests African health journals are struggling to stay afloat. Study findings suggest issues with finances and visibility may be to blame, together with a decrease in submissions due to authors preferring non-African journals. The African journals request lower article processing charges in comparison to the rest of the world. Next, only a fraction of AJOL-indexed journals is registered on major databases, and those that are registered often have outdated information. The outdated information may be detrimental to the journals' reputation affecting researchers' decision to submit. Furthermore, it appears the challenges faced by African journals could be the cause or the result of a lower academic reputation considering that Africa had lower quantitative bibliometrics than the rest of the world.

Although there is minimal inclusion of African health journals in international databases, scholarly activity including research formulation and publication in local and international health journals is increasing on the continent [14]. The African health research community is working to increase the visibility of local journals through international collaborations between African journals and reputable non-African journals. The development of local and international journal partnerships such as the African Journal Partnership Project (AJPP) and the Forum for African Medical Editors (FAME) [15–18], together with effective journal marketing and promotion using technological tools such as the internet are important in ensuring African journal visibility and sustainability. These partnerships are helping local journals with

the requisite resources and skills to upgrade their editorial process and manuscript submission system to reduce the hurdles faced by authors during the submission process [15]. They have identified the challenges faced by African journals and implemented programs that increase the quality and distribution of African health research through sustainable peer review editorial models, websites, and mentorship.

One way journals can increase their visibility is through indexation in international databases such as PubMed and Web of Science. Eleven African countries have journals indexed in PubMed with Nigeria and South Africa having the highest number of indexed journals [19]. In 2008, Goehl [15] found that of 5,000 health journals indexed in Medline, only 38 health journals were from Africa and these from just 13 African countries. The discrepancy between our findings and those of Goehl [15] can be attributed to the short lifespan of African health journals. Many African health journals were inactive in our series. Our findings and those of Goehl [15] indicate low journal longevity and national representation. The national representation is concerning especially for the non-English speaking African countries. We recommend caution regarding this finding because the difference might be the result of AJOL being biased towards the registration of English journals.

Journals need cash inflow to cater for administrative expenses involving editing, peer-reviews, and salary payment of journal staff—but they should not be borne by individual researchers or institutions that lack funding. These funds are even more important for African journals that need these funds to improve the editorial experience for authors and the distribution of their articles. The open-access model provides funds for journals and increases access and visibility for articles. Almost half of the African health journals identified on AJOL publish open access, which is an interesting trend as a study by Iyandemye et al. shows that Low- Income Countries especially from Sub-Saharan Africa have the highest contribution to open access biomedical publication in a series of over 500,000 publications when compared with publications from other part of the world [20]. Unfortunately, most African health researchers bear the cost of open-access publication because they lack external or institutional funding [15]. It is true that funded journals offer free open-access publication to researchers from low-income countries and partial waivers to those from middle-income countries. However, these funds may not always be available to African researchers. Twenty-three of the 54 African countries are classified as low-income so researchers from the other countries pay between 50 and 100% of the article processing charge [21]. In addition, some journals only offer full waivers if all the authors are from a low-income country [22, 23]. This rule has the effect of discouraging collaborations and limiting the target journal options. We found article processing charges were highly variable with no explicit explanatory factors for these charges. Past studies have found similar results with African journals posting lower article processing charges than non-African journals [23–25]. Hence, for African health journals to increase their visibility, editorial quality, and peer-review process sustainably without African

researchers facing financial hardship there needs to be an alternative funding mechanism. This gap can be plugged in by governmental and non-governmental funders if they set aside funding for open access.

Like African health journals, African researchers face significant challenges, especially when attempting to publish their research. The limited number of local journals and their lower reputation in comparison to high-income country journals means most Africans have to submit their work to non-African journals. For many African researchers, this means having to translate their work into English, paying to access references and for article processing, and facing bias because editors and reviewers do not understand the local context [26, 27]. Despite these challenges, African researchers have continuously increased their research output over the last decade [28]. This increase must be interpreted carefully given that only about 2% of African research gets published [28]. Initially, many African researchers would prefer submitting their work to reputable high-income country journals because these journals tend to have a wider audience which leads to higher citations, impact factors, and recognition [29]. The higher rejection rates of African manuscripts by top journals have gradually curtailed this tendency [28]. The paucity of reputable African journals and higher rejection rates from reputable non-African journals created a void that has been filled by predatory journals offering rapid publication with minimal peer-review against significant monetary compensation [28, 30, 31].

Predatory journals are deleterious to the quality of research, the reputation of African researchers and institutions, quality of care, and they squander the dwindling African research funds [30, 31]. Researchers from all around the world have called for an all-out battle against predatory journals but the big challenge is defining predatory journals. Unfortunately, many legitimate African journals have been misclassified as predatory based on current predatory journal definitions [31]. The data discrepancies and incompleteness found in this study confirm that the challenges faced by African journals may have them be misclassified as being predatory.

We recognize the importance of alternative bibliographic sources like e-print archives and physical library databases in Africa. These databases hold an impressive amount of unpublished and non-peer-reviewed African research. Unlike physical libraries, e-print archives offer instantaneous access and minimal financial constraints. Unfortunately, this resource is underutilized. We believe this represents an opportunity for the African research ecosystem. The digitization of thesis and dissertations found in African libraries and their indexation in online databases such as AfricArXiv will increase knowledge sharing and collaboration.

There are a few methodological limitations to this study. While AJOL is the largest single collection of peer-reviewed African journals, we acknowledge that there are likely more health journals not listed on the health section of AJOL and as such are not included in this study. Secondly, some journal details on AJOL were not up-to-date. For example, the last issue date on AJOL often differed from the date on the journal website. We solved this discrepancy by using the journal data. Thirdly, some journals listed on AJOL did not have websites so we were not able to verify the information as listed on AJOL. Lastly, AJOL lacks important bibliometric metadata and metrics necessary for analysing the contents and impact of African health journals. For this reason, we complemented the AJOL metadata with citation metrics from the SJR.

In conclusion, African Health journals need to be better curated on major online databases with regular up-to-date information and bibliometric data included on such databases. African health journals also need to develop sustainable business models and collaborations that will ensure scholarly research output on a regular basis without any detriment to scientific rigor and standard journal publishing practices while employing the use of technological advancements in their article processing and website outlook.

## AUTHOR CONTRIBUTIONS

OO: Conception, data collection, data analysis and interpretation, drafting the article, final approval of manuscript. AT: Data collection, data analysis and interpretation, drafting the article, final approval of manuscript. OED, LS, DS, OMD, HG, and NA-B: Data analysis and interpretation, drafting the article, final approval of manuscript. AN: Data collection, data analysis and interpretation, final approval of manuscript. JC and IE: Project supervision, critical revision of article, final approval of manuscript. UK: Conception, data analysis and interpretation, drafting the article, critical revision of article, project supervision, final approval of manuscript.

## CONFLICT OF INTEREST

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

## SUPPLEMENTARY MATERIAL

The Supplementary Material for this article can be found online at: <https://www.ssph-journal.org/articles/10.3389/ijph.2022.1604932/full#supplementary-material>

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