# Visualization and Bibliometric Analysis of Healthcare Management Research in Africa

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**Abstract**: This study analyses the trends in healthcare management and operation research literature with emphasis on bibliometric analysis. A search in the web of science database was conducted. Article features registered in the database were selected. The analysis focused on trends over time, keywords, challenges, and opportunities. The result of the publication of analysed articles shows that there is an increase interest of research to the healthcare system optimization in Africa.

**Keywords**: healthcare; health management; bibliometric analysis

## 1.Introduction

Understanding and addressing healthcare delivery challenges in Africa is complex and complicated due to the absence of data on how decisions are made in hospitals in Africa [1]. Therefore, this study seeks to provide a quick study on the depth of literature on healthcare management in Africa. This come to complement to what is already done and is an examination of the influence and extent of Africa researchers on local problems.

Bibliometric analysis provides the literature's overview regarding the aspects of healthcare management [2-4]. It objective is to provide the context of research, highlight the trend of research directions of future work, and identify influential authors, institutions, countries, and research teams for a certain them.

This paper aims to provide a comprehensive review of healthcare management practices in Africa, analyzing research, trends, challenges, and opportunities that have shaped the region's healthcare landscape. By conducting a bibliometric analysis, we endeavor to gain valuable insights into the current state of healthcare management research, the influential stakeholders, and the emerging areas of focus.

The aim of this paper is to present a bibliometric analysis of the literature dealing with healthcare management in Africa with the research objective of analysing the dynamics of scientific publication of healthcare management literature in Africa.

## 2.Materials and Methods

### 2.1. Database

Articles used in this study are identified from the Scopus and the Web of Science Clarivate databases. This search took place between January and August 2023. Keywords that relate to healthcare management were used to search the database. No limits have been imposed for identifying articles, research reports, reviews, or books.

### 2.2. Keywords

Database searching was conducted using the expressions ("healthcare management" OR "hospital management" OR "health system management" OR "primary care management" OR "clinical

management" OR "acute care management" OR "nursing management" AND Afric*). Those keywords must occur in the article's topic.

### 2.3. Criteria Used to Include Articles in the Analysis

The analysis followed [5-9] includes articles published in academic journals with impact factors indexed in the web of science database and have the above keywords. referring to healthcare management.

### 2.4. Bibliometric Analysis

The bibliometric data (year of publication, number of authors, the journal in which it was published, the country of residence of the main author) of each article were recorded and analyzed using the the methodology in [10-15]

### 3. Results and discussion.

A total of 475 articles were included in the analysis. Table 1 presents the summary of the collected data.

Table 1. Summary of the bibliometric data collected.

| Timespan | Sources (Journals, Books, etc) | Documents | Annual Growth Rate % | Document Average Age | Average citations per doc | International co-authorships % |
|---|---|---|---|---|---|---|
| 1991:2023 | 475 | 822 | 12.47 | 7.52 | 26.49 | 50.73 |
| References | Keywords Plus (ID) | Author's Keywords (DE) | Authors | Authors of single-authored docs | Single-authored docs | Co-Authors per Doc |
| 33279 | 2545 | 2023 | 5595 | 49 | 52 | 7.49 |
| article | article; book chapter | article; early access | article; proceedings paper | biographical-item | editorial material | |
| 658 | 1 | 6 | 6 | 1 | 14 | |
| letter | meeting abstract | note | proceedings paper | review | review; book chapter | review; early access |
| 4 | 3 | 1 | 8 | 116 | 3 | 1 |

Figure 1 shows the annual production of healthcare management publication from 1990 to 2022. We observe a consistent quadratic increasing trend. The volume has especially grown from 2009. Figure 2 shows the average number of cited papers per year. As shown by Figure 2, on average at most 8 citations per year were recorded in 2010. The citation of paper in this field have not been consistent and steady. Figure 3 shows the top used keywords. The relationship between the top papers, their authors and the top 30 keywords have been skewed. It seems that the top 30 authors only used twelve keywords in their papers. The top ten keywords used by authors. The top ten keywords include care (n = 61), Africa (n = 54), mortality (48), prevalence (48), children (43), disease (40), diagnosis (39), infection (37), clinical management (36), and management (36). Care has been the most frequently used keyword both from the beginning to the end. Keyword use dynamic has been divided into 4 as shown in Figure 4.
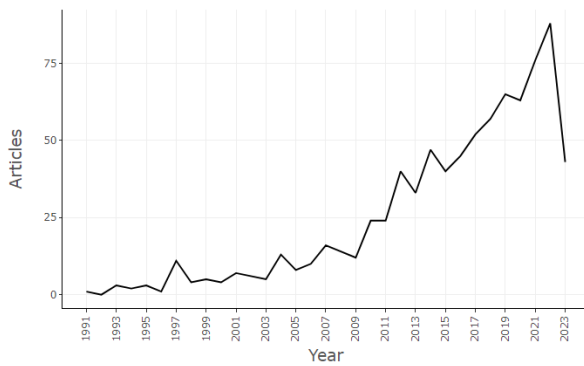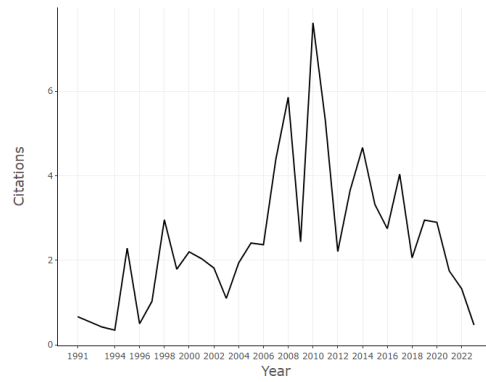
Figure 1. Publication growth
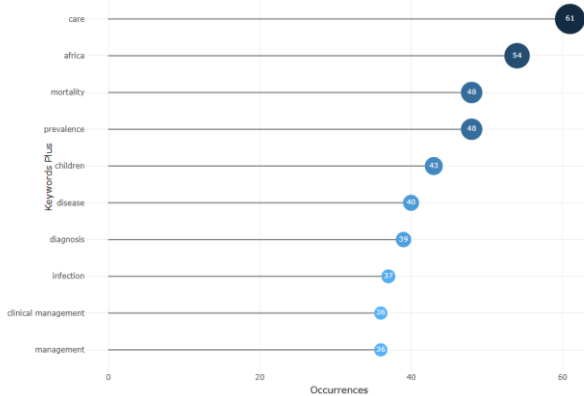


Figure 2. Average yearly citation
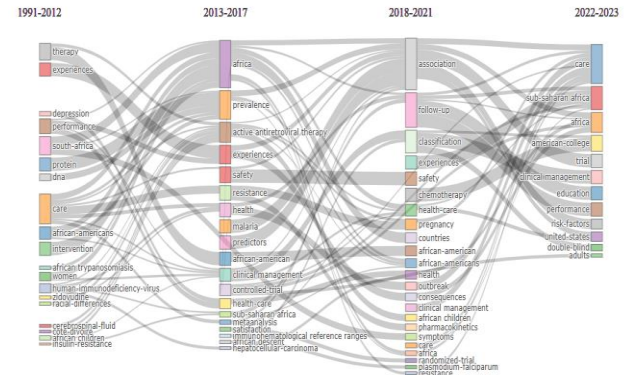


Figure 3. Top ten keywords



Figure 4. Keywords dynamism over the years

The first is dominated by patient care, and the second by prevalence of healthcare issue in the healthcare system. The third is characterized by patient follow-up with several polio, malaria, and tuberculosis immunisation campaigns. Finally, the focus has returned to patient care and the optimization of healthcare provision in the healthcare system. Care includes medical care of patients, that is the flow of patient for diagnosis, treatment, and management of medical conditions by healthcare professionals. If the patient is retained, there is a nurse's care need where they administer medications, monitor vital signs, assist with activities of daily living, and educate patients and their families about managing their health conditions.

Methodologies used in the study of healthcare management includes simulations, queueing models, data mining, and optimization models. Most researchers have not used AI and ML models because of either lack of data or lack of access to data. This study shows that many African lack adequate healthcare infrastructure. Before optimizing the use of something, that thing must be available. The lack of hospitals, clinics, and medical equipment is one of the heaviest blows to the healthcare system in Africa. In this condition where funding and finance are constrained, and there is a struggle to allocate sufficient resources to the health sector due to competing priorities like education, infrastructure, and defense, there is a greater need for the use of AI and Machine learning to devise means to optimize the use of current resources. It is no new that there is a high shortage for healthcare workforce. Optimization methods are useful to schedule available personnel for optimal utilization.
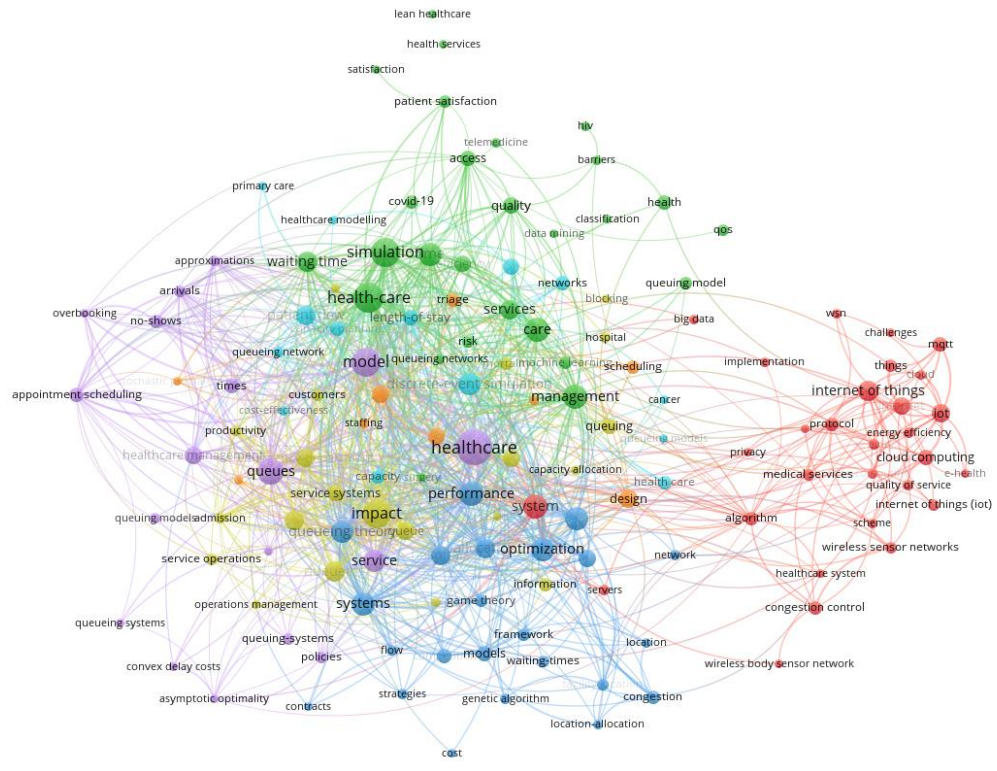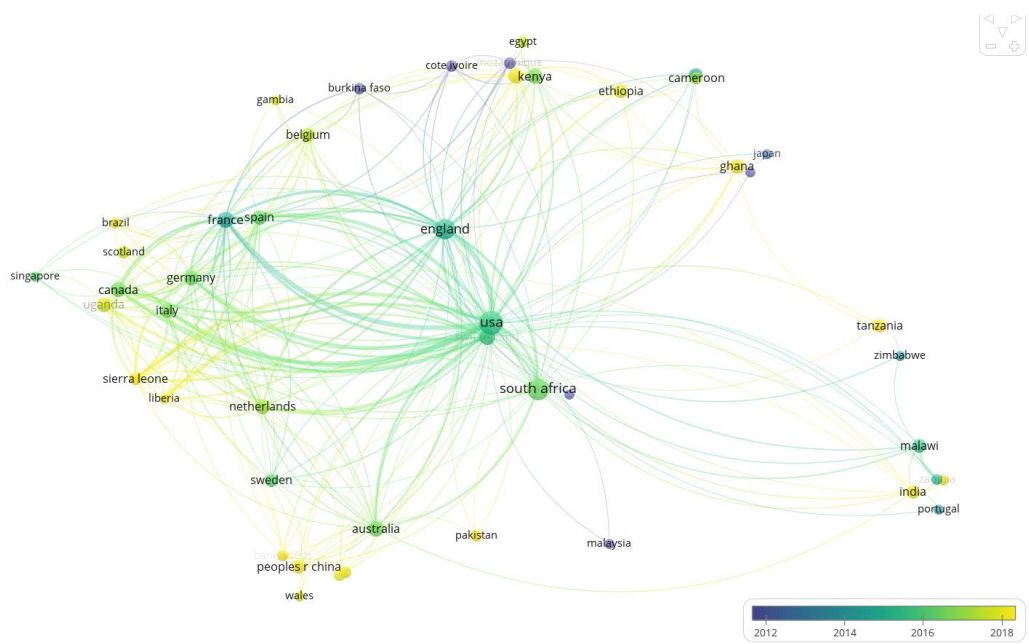
Figure 5. Co-word network



Figure 6. Author country network.

The results of the present study show that there is an increase in the production of research on healthcare management. This may be due to increase healthcare needs and societal challenges in assessing. healthcare management and operation in Africa is a complex and multifaceted issue, but with concerted efforts from all stakeholders' positive changes can be made.

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