

An Informetric Analysis of Selected African Medical Journals Published in the African Journals OnLine (AJOL)

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Introduction

African-published research papers have been under-utilised, under-valued and under-cited in the international and African research arenas mainly due to difficulties of accessing them. The Internet/WWW provides an opportunity to change this state of affairs. However, many hundreds of worthy, peer-reviewed scholarly journals published from Africa cannot host their content online in isolation because of resource limitations and the digital divide. Consequently, a number of projects have been initiated and co-funded by western donors to stimulate the development of e-journals in Africa. Examples of such initiatives are the African e-Journals Project, African Journals Online (AJOL), and the Council for the Development of Social Science Research in Africa (CODESRIA).

AJOL has grown to host the content of over 380 African-published, peer-reviewed journals from 29 countries. The AJOL website has a Google PageRank of 8 and is visited each month by over 180,000 researchers from 190 countries around the world; an indication of the need and widespread use of the AJOL initiative. AJOL allows for free access to thousands of article abstracts, and offers a progressively charged article download service for researchers and librarians to access full text articles.

Journals play a vital role in the measurement of research output and/or impact because they are the most commonly used avenue for disseminating research findings. Therefore, not only do journals provide a platform on which the research output and impact of individual authors, institutions or countries are measured (Ocholla and Ocholla, 2007), but they are also subjects of evaluation in and of themselves. Citing several authors, Onyancha (2008) observes that there are as "many reasons for evaluating journals as there are different groups of people interested in information production, storage, dissemination and use." Depending on the purpose of individual studies, descriptive and/or evaluative informetric analyses have been conducted to evaluate journals using one or more measurement indicators(see Alloro, Casilli, Taningher and Ugolini, 1998; Altmann and Gorman, 1998; Black, 1999; Adusumilli, Chan, Ben-Porat, Stiles and Fong, 2003; Miguel-Dasit, Aleixandre, Valderrama, Marti-Bonmati and Sanfeliu, 2005; Coats, 2005; Togia and Tsigilis, 2006; Tsay, 2006; Jones, 2007; Jamal, Smith and Watson, 2008; Onyancha, 2008). To a large extent, the citation databases of Thomson have acted as the sole sources of data for the aforementioned and other related studies, especially the studies that made use of citations to evaluate scholarly journals. Onyancha (2008) reports that citation analyses of scholarly journals published in Africa as a whole, and Sub-Saharan Africa in particular, have eluded research evaluators and decision makers for a long time, mainly because: a) Citation analyses are commonly conducted using ISI's citation indexes, but most journals published in Africa are not indexed in these indexes; b) ISI citation indexes are inaccessible because of their high subscription fees (most institutions in Africa cannot afford to purchase the citation indexes in CD-ROM format or by subscribing to the Web of Science, ISI's portal to the citation indexes); c)The manual examination of references

using hard copy (or print) journals in order to conduct a citation analysis can be very tedious and sometimes inaccurate; d) Informetricians are few in sub-Saharan Africa. Only one university in sub-Saharan Africa-the University of Ibadan, Nigeria-offers formal training in informetrics and has an established centre for studies/research on the subject, namely: Africa Regional Centre for Information Science (ARCIS); e) Africa, and more particularly sub-Saharan Africa, lacks science and technology databases that can be used to conduct informetric studies (Nwagwu, 2005, 2007); f) Informetrics, both as a research method and as a sub-field of library and information science, is not considered as viable as other sub-fields/courses in LIS schools in Sub-Saharan Africa.

With regard to LIS research, few citation-related studies have been conducted in Africa. Onyancha and Ocholla (2008) reveal that although ISI's citation indexes are still widely used to evaluate research both regionally and internationally, there is an increased usage of Google Scholar and, to a limited extent, Scopus (e.g. Yang and Meho, 2006; Bar-Ilan, 2006; Noruzi, 2005; Pauly & Stergiou, 2005; Bar-Ilan, Levene and Lin, 2007; Charbonneau, 2006; and Harzing, 2007). While taking cognisance of the limitations associated with Google Scholar (e.g. its inclusion of non-scholarly citations; limited coverage of scholarly journals; and the longer period it takes to update the service when compared to ISI's databases), Onyancha and Ocholla (2008) nevertheless advise the use of the service to assess researchers' performance in developing countries as it is "affordable and easily accessible when compared to the costly Thomson Scientific service and Elsevier's very expensive search engine, Scopus".

Objectives

The main objective of this paper is two-fold: (1) to assess the citedness of AJOL medical journals; and (2) to demonstrate the use of Google Scholar and SCImago as tools in analysing citations of non-ISI indexed journals. The specific objectives are to analyse citations in the AJOL journals under review in order to:

- Determine the publication trends of the AJOL medical journals
- Determine the number of cited and uncited documents in the AJOL medical journals
- Measure each journal's influence using citation impact factors
- Rank the journals according to SRJ and h-index
- Identify the journals with the most cited works

Methodology

The study mainly used a citation analysis of selected journals. The total number of selected journals was 54 (see Appendix A). Citation data was extracted from Internet/WWW using SCImago and Google Scholar using the Publish or Perish [R] (PoP) software. Data was analysed and converted to obtain, among other statistics, the following: total number of papers, total number of citations, average number of citations per paper, average number of citations per year, and Hirsch's h-index.

Limitations of the study

An aspect that deserves mention is that the accuracy of the results provided below depends on the results returned by Google Scholar and SCImago. The results of the analyses, based on data from Google Scholar and SCImago only, may therefore not cover all the records/papers that the respective journals actually published, but may nevertheless be used to reflect each journal's productivity and influence. It was not possible to obtain data for four journals: *African Journal of Medicine and Medical Science*, *Egyptian Journal of Neurology, Psychiatry and Neurosurgery*, *Journal of Endocrinology, Metabolism and Diabetes of South Africa*, and *Nigerian Quarterly Journal of Hospital Medicine*.

Results

Publication Age of the Medical Journals in AJOL

The findings show that the currently active medical journals were relatively young. Results show that 46.3% of the journals were 10 years old and below in publication, 24.1% were 11-20 years old in publication, 13.0% were 21-30 years old in publication, 11.1% were 31-40 years old in publication, 3.7% were 41-50 years old in publication, and 1.9% were over 51 years old in publication (Table 1). Therefore 70% of the journals were less than twenty years old in publication. The oldest journals in publication were the *South African Medical Journal* (73 years old), the *South African Journal of Obstetrics and Gynaecology* (48 years old), the *Egyptian Medical Journal* (42 years old), and the *African Journal of Psychiatry* (37 years old).

Table 1: Number of years in publication

	Frequency	Percent	Cumulative Percent
10 and below	25	46.3	46.3
11-20	13	24.1	70.4
21-30	7	13.0	83.3
31-40	6	11.1	94.4
41-50	2	3.7	98.1
51+	1	1.9	100.0
Total	54	100.0	

Productivity and Publication Trends

In terms of publication trends, figure 1 below shows that journal productivity has steadily been increasing over the years, from 64 publications in 1998 to 882 publications in 2009. There was slight decline in 2010, from 882 in the previous year to 710. The findings also indicate that prior to the launch of AJOL in 1998) there was a very slow increase of journal productivity. Therefore, this increase in journal productivity may be attributed mainly to the introduction of AJOL. Nearly 76% of the medical journals recorded over 100 publications during the period 1998-2010.

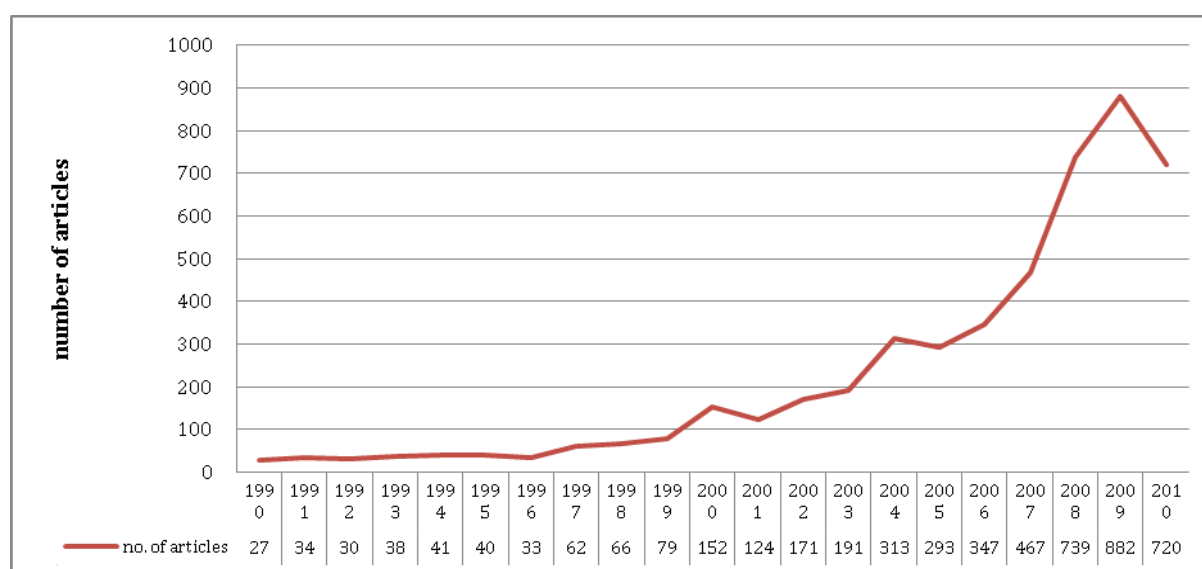


Figure 3: Journal productivity, 1990-2010

International Author Collaboration

Fig. 2 below shows average international collaboration rates of the AJOL medical journals. The results show that there has been a general increase in the collaboration rate from 0.90 in 1999 to 13.61 in 2009.

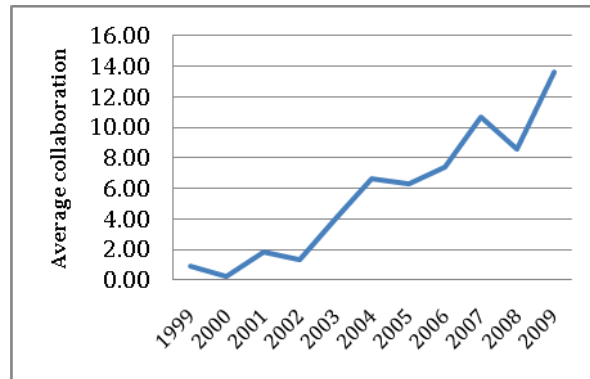


Figure 4: International collaboration rate

Citedness of journals

Figure 3 shows that the visibility of African medical journals in AJOL have been steadily improving over the years. The results further indicate that 37.0% of the journals received 1-49 citations, 11.1% received 50-100 citations, 25.9% received 101-200 citations, 3.7% received 201-300 citations, 9.3% received 301-500 citations, and 13.0% received over 500 citations. These results therefore reveal that 87.0% of the journals received 500 citations or less.

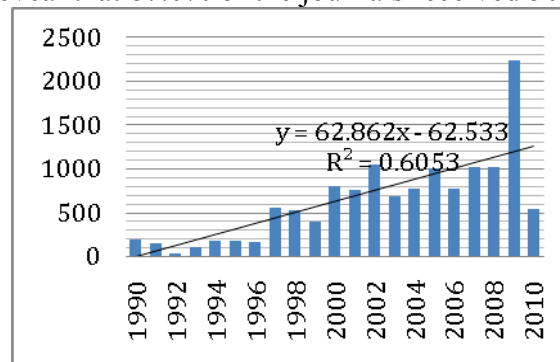


Figure 5: Journal citation trend

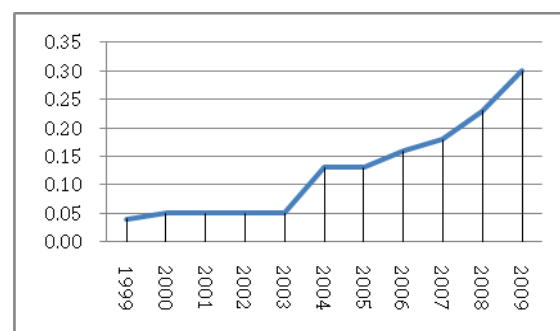


Figure 6: Citation rate (4years)

Journal Impact

Fig. shows the distribution of the journal impact factor (h-index and SCImago journal ranking indicators (SJR)) for the year 2009. Ten journals had 0.0 impact factor; 4 journals had 0.1 IF; 5 journals had 0.3 IF; 6 journals had 0.4 IF; 2 journals had 0.5 IF; and 1 journal had 0.6 IF. The average h-index was 4.66 while the average SJR was 0.44. The maximum h-index was 30 while the maximum SJR was 0.11. There was a strong positive correlation between h-index and SJR rankings ($r = 0.714$; $p < 0.0001$).

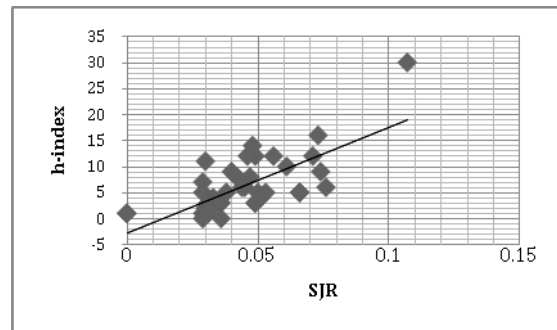


Figure 7: Journal impact

Discussions

The findings show that although AJOL is relatively young (70% of the journals surveyed have less than 20 years old in publication), research productivity has increased over the years from 1998 to 2010. This is an indicator that AJOL has to larger extent encouraged research productivity in Africa. An examination into the number of publications per journal indicates that the 54 journals surveyed can be divided into three categories:

- Journals that published 40 articles and below (these constituted 9.2%)
- Journals that published 41-99 articles (14.8%)
- Journals that published more than 100 articles (75.9%)

An analysis of the journals' performance according to the citation impact factor (SJR and h-index, respectively) reveals a relatively strong input from the *South African Medical Journal* (0.107; 30), *African Journal of Reproductive Health* (0.073; 16), *West African Journal of Medicine* (0.048; 14), *African Journal of Medicine and Medical Sciences* (0.049; 12), *Ethiopian Medical Journal* (0.046; 12), *Cardiovascular Journal of Africa* (0.071; 12), and *South African Journal of Surgery* (0.056; 12). These journals recorded higher IFs than the rest of the journals.

These findings therefore tend to suggest that African research will significantly improve in terms of accessibility and visibility as they get published on the Internet and the WWW. Since impact factors are generally perceived to be measures of quality and/or influence, the high IFs of the AJOL medical journals may imply high quality on their part. This, however, is not conclusive as IFs are not absolute measures of quality.

Conclusion

The findings show that the publishing of African research output on the World Wide Web has improved their accessibility and visibility. It is therefore hoped that such initiatives will greatly contribute to improved productivity, quality, accessibility and visibility of the research output in developing countries; thus eventually reducing their under-utilisation, under-value and under-citedness in the international and African research arenas.

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Appendix A: List of surveyed AJOL medical journals

SN	ISSN	Journal title
1	3796531	Adler Museum bulletin
2	16879112	Advances in hematology
3	16806905	African Health Science
4	11195096	African Journal Biomedical Research
5	20060165	African Journal of Infectious Diseases
6	19960808	African Journal of Microbiology Research
7	19948220	African Journal of Psychiatry
8	11184841	African journal of reproductive health
9	1896016	African Journal of Traditional, Complementary and Alternative Medicines
10	16876970	Anesthesiology Research and Practice
11	15963519	Annals of African Medicine
12	16871979	Arab Journal of Gastroenterology
13	19951892	Cardiovascular Journal of Africa
14	13575279	Child Care in Practice
15	10166742	CME
16	3798577	Curationis
17	16093607	Current Allergy and Clinical Immunology
18	8568960	East African journal of public health
19	11104902	Egyptian journal of immunology
20	11108630	Egyptian Journal of Medical Human Genetics
21	141755	Ethiopian Medical Journal
22	16877098	Interdisciplinary Perspectives on Infectious Diseases
23	15969886	International Journal of Health Research
24	16876423	International Journal of Telemedicine and Applications
25	17280591	Journal of Child and Adolescent Mental Health
26	16879813	Journal of Environmental and Public Health
27	19960875	Journal of Medicinal Plant Research
28	11100362	Journal of the Egyptian National Cancer Institute
29	19930836	Le Mali medical
30	19957270	Malawi Medical Journal
31	18133339	Malta Medical Journal
32	11105690	Middle East Fertility Society Journal
33	11193077	Nigerian Journal of Clinical Practice
34	11152613	Nigerian journal of medicine
35	0794859X	Nigerian journal of physiological sciences
36	11171936	Nigerian postgraduate medical journal
37	10291962	Obstetrics and Gynaecology Forum
38	10294864	SADJ: Journal of the South African Dental Association
39	17290376	Sahara J
40	19997671	SAJCH South African Journal of Child Health
41	1726426X	South African Family Practice
42	18121659	South African Gastroenterology Review
43	10118578	South African Journal of Clinical Nutrition
44	3798046	South African journal of communication disorders
45	382329	South African Journal of Obstetrics and Gynaecology
46	16089685	South African Journal of Psychiatry
47	382361	South African Journal of Surgery
48	382469	South African Medical Journal
49	10279148	Southern African Journal of Anaesthesia and Analgesia
50	15628264	Southern African Journal of Critical Care
51	16089693	Southern African Journal of HIV Medicine
52	18216404	Tanzania journal of health research
53	15965996	Tropical Journal of Pharmaceutical Research
54	0189160X	West African Journal of Medicine