Original Article

Bibliometric analysis of alcohol and substance use prevention research in Africa

Roy Tapera[1], Lucia M. Mupara[2], Morekwe Selemogwe-Matsetse[2], Johane T. Kehumile[2], Lebogang Gaogane[2] Ellen Tsholofelo[2] Pretty Murambiwa[2]

[1]Department of Environmental Health, School of Public Health, University of Botswana, Gaborone, Botswana.
[2]Department of Health Promotion and Education, School of Public Health, Boitekanelo College, Gaborone, Botswana

ABSTRACT

Background: In response to international efforts to prevent alcohol and substance use we designed this study to give a bibliometric overview of research productivity in alcohol and substance use prevention in Africa.

Methods: Review of original research articles authored or co-authored by investigators from African countries on substance use prevention during the period 2008-2018 were done through retrieving them from, Web of Science (WoS), Ebscohost and Pubmed (National Library of Medicine). Key words related to alcohol and substance use were used to retrieve relevant literature.

Results: Our search returned 3600 hits, with 34 studies retained. Included studies were conducted in 12 countries across the five regions in Africa (Central, East, North, South and West) and spreading over an 11-year period, 2008-2018. The annual published articles showed a significant rise from 2008 to 2018 with South Africa being ranked number one with a total of 9 (31%) published articles followed by Kenya 4 (13.8%). Bronwyn Myers from South Africa and Atwoli et al from Kenya were the most prolific authors. Age and gender were the most reported risk factors in the selected studies. Medical Research Council of South Africa, Stellenbosch University and Moi University are the active Institutions in alcohol and drug use prevention research.

Conclusions: There were few collaborations among Africans themselves yet these collaborations would enhance future alcohol and substance use prevention research productivity. Currently, a wide spectrum of substance use prevention interventions have been implemented throughout the African continent, ranging from individual to community based interventions.

INTRODUCTION

The term "bibliometrics" was first coined by Alan Pritchard in 1969 who described it as, "the application of mathematics and statistical methods to books and other media of communication"[1]. It is basically a quantitative method used to investigate scientific communication progress by measuring and analysing various aspects of written documents. This type of study is to establish the growth pattern, progress and spread of any discipline or area of research. Citation analysis and content analysis are commonly used in bibliometric methods and it deals with the relationships between the cited and citing documents[2]. Bibliometric analysis is a simple statistical method of bibliography counting to evaluate and quantify the growth of a subject[2].

Corresponding author:
Roy Tapera
Private Bag 82293 Molapo Crossing, Gaborone.
Email: taperar@ub.ac.bw
Phone number: (00267) 76533462

Keywords: Bibliometric, substance use prevention, Web of Science, EBSCOhost, PubMed.

Literature has proven that research is of paramount importance in the development of health policy[3,4]. Publications are used to inform the evidence base and contextualize public health debate[4]. Furthermore, trends and characteristics of publications can be evaluated by bibliometric analysis. The bibliometric analysis examines the impact and quantity of journal publications on a research subject. It is through the adoption of Bibliometric analysis that the researchers can be able to come up with both the prominent and emerging areas of research as well as the researchers working in those areas and hence its importance[5,6].

Substance use prevention is a neglected public health issue with minimal information available in both published and grey literature[7]. Alcohol and substance use have adverse health and safety consequences and also inflict significant social and economic development losses on individuals and the society at large[8,9]. A growing literature shows that several approaches to substance use prevention can substantially reduce adolescent substance use[10].

No assessment on mapping both the peer-reviewed literature and health literature has been done in Africa despite the growing problem of alcohol and substance use in the last decade[11]. The main aim of this study was to assess research productivity in the field of alcohol and substance use prevention from EBSCOhost, PubMed, and (WoS) during the period 2008-2018 from Africa. Specifically, the study examined the growth of publications, authorship, geographical distribution in Africa, international research collaboration, and highly cited articles in alcohol and substance use prevention strategies. Alcohol and substance use prevention research output will give decisions and policymakers the soundest evidence-based prevention methods, which are of paramount importance if alcohol and substance use problems are to be curbed in the continent.

METHODOLOGY

Review of research articles authored or co-authored by investigators from African countries on alcohol and substance use prevention during the period 2008-2018 was conducted by retrieving articles from (WoS), Ebscohost, and PubMed scientific databases on Mar 17, 2019, to Jun 20, 2019. We used (WoS) because it allows researchers to retrieve documents based on the research category, For example, WoS has a search category called "substance abuse," which encompasses all journals in the field of substance abuse. Secondly, WoS is a rich database that includes leading and high impact journals in a scientific field[12-15] Journals indexed in WoS are considered internationally leading and powerful journals with international reputation and impact in the field of substance use. Thirdly, WoS covers most scientific publication and not only the medical and biomedical publication. Finally, WoS covers the oldest publications with records dating back to 1900. We also used PubMed because it can be accessed for free. The keyword search with PubMed offers optimal update frequency and includes online early articles. PubMed is generally easier to use and freely accessible by anyone who can access the Internet (http://library.mcphu.edu/guides/Medlinecompare.htm). We saw it fit to use EBSCOhost because it generated title comparisons focusing on "active" full-text content so that the requestor receives an accurate representation of how the ongoing, active content of each resource compares[16]. EBSCOhost has extensive options in advanced search compared to the other databases. These websites therefore complimented each other where the other was found lacking.

In this study to increase accuracy, the search was restricted to the scientific paper topic or field, requiring that at least one keyword is present indicating an alcohol, narcotics, prescription drugs, and tobacco (ANDT) substance. The search strategy was to search the relevant databases for ([Substance abuse prevention, Drug and substance abuse prevention, Alcohol and substance use

prevention, The prevention part was also replaced during search with [Risk factors, protective factors, school-based, community based, Imperial intervention, policy-based interventions, combined interventions, initiation, media-based interventions, tobacco cessation programs, gateway theory] Alcohol and substance abuse, alcohol: alcohol, beer, drink, ethanol, liquor, wine; illicit drugs: buprenorphine, amphetamine, cannabinol, cannabis, cocaine, codeine, heroin, Lysergic acid diethylamide (LSD), mescaline, methadone, methamphetamine, morphine, narcotics, opiate, opioid, Phencyclidine (PCP), Tetrahydrocannabinol (THC); medicinal drugs: amphetamine, barbiturates, benzodiazepines, buprenorphine, codeine, methadone, morphine, opiate, opioid, prescription, tramadol; steroids: steroid and tobacco: nicotine, smoking, snuff, tobacco] in Medical Subject Headings Mesh). The number of publications in each African region each year using the African Union country classification of 2017, in addition to the citation indices for these publications, was retrieved. Research activities were assessed by analyzing the annual research productivity, contribution of each African country, names of journals, citations, and prevention research strategies.

Inclusion and Exclusion criteria

Inclusion criteria: papers written in English, research focusing on Africa, articles that focus on prevention of alcohol and substance use, and papers published within 2008-2018. A total of 3600 documents were found. Books, conference proceedings, conference papers, abstracts, articles outside the African region, and undefined documents were excluded from analysis, resulting in a final sample of 34 documents.

Exclusion criteria: Any language which is not English, research outside Africa, papers that do not focus on prevention of alcohol and substance use, and articles not published within 2008-2018.

Ethics

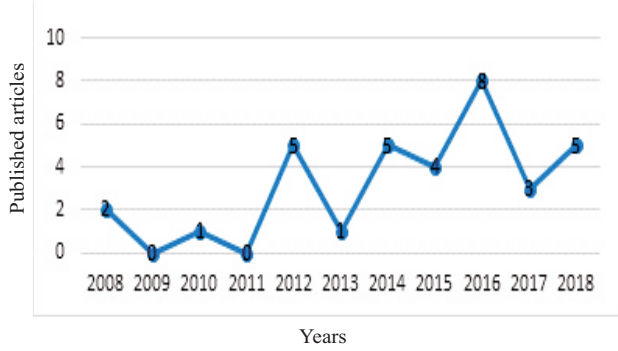
No ethics approval was required since this was an analysis of available published research. There were no authors contacted for further information regarding their publication.

RESULTS

Number of published documents with time

A total of 34 journal articles from 2008 to 2018 were retrieved from (Wos), EBSCOhost, and PubMed. The annual research productivity was very low but showed a slight increase in the last few years preceding 2018, as shown in figure 1.

Figure 1: Number of articles published by date



Research productivity by country and collaborations

It was noted that, during the study period, South Africa had the highest number of publications, which were 9 (26.5%), and Kenya came second with 4 (11.9%) publications. See table 1. It should, however, be noted that these statistics are in terms of quantity and absolute figures. The most productive authors were Browyn (South Africa) and Atwpli et al. (Kenya). Institutions that were most active in the research to do with alcohol and substance use prevention were Stellenbosch University, Moi University, and the Medical Research Council of South Africa. Collaborations were noted more frequently between high- income countries, and they became fewer among low and middle-income countries (LMICs).

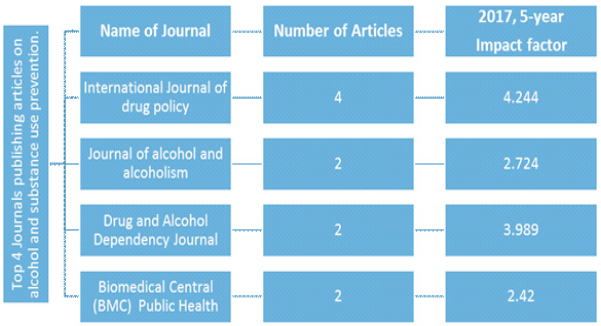
Table 1. Number of publication by country.

Region	Country	Frequency	Percent
East Africa	Kenya	4	11.9
	Ethiopia	2	5.9
	Tanzania	1	2.9
	Uganda	2	5.9
Southern Africa	South Africa	9	26.5
	Zimbabwe	1	2.9
	Zambia	1	2.9
North Africa	Morocco	2	5.9
	Egypt & Morocco	1	2.9
	North Africa region	3	8.9
West Africa	Senegal	1	2.9
	Ghana	1	2.9
Africa	Country collaboration research	6	17.6
Total		34	100

Most productive Journals

Publications were primarily from specialty journals that focused on alcohol and substance use, as indicated in (Figure: 2). The International Journal of drug policy was the journal with the most published articles and had the highest impact factor.

Figure 2 Top 4 Journals publishing articles on alcohol and substance use prevention.



The most productive institution in alcohol and substance use prevention research in African countries were Medical Research Council of South Africa followed by Stellenbosch University and Moi University. Collaborations between USA researchers and researchers from African countries was apparent. Authors from USA appeared in articles, published by authors from African countries. Other collaborating countries were United Kingdom, Canada, and New Zealand. International Journal of drug policy was the journal with the most published articles and had the highest impact factor (Table: 2).

Table 2 Top 4 Journals publishing articles on alcohol and substance use prevention.

Rank	Name of journal	Number of articles	2017 5-year impact factor
1	International Journal of drug policy	4	4.244
2	Journal of alcohol and alcoholism	2	2.724
3	Drug and Alcohol dependency	2	3.989
4	Biomedical Central (BMC) Public Health	2	2.42

Most cited authors

Citations of the 34 articles published in African countries were 509 including self-citations. The average citation per document was 14.9 and an h index of 17 at the time of data analysis that is, there were 17 papers that were each cited at least 17 times[5]. Table 3 shows the ten most highly cited authors in alcohol and substance use prevention.

The highest number of citations obtained was (105) by Wechsberg from the article titled "Alcohol, cannabis, and methamphetamine use and other risk behaviours among Black and Coloured South African women: A small randomized trial in the Western Cape" received the highest number citations. This was followed by Sreeramareddy et al., 2014 from the article titled "Prevalence, distribution, and social determinants of tobacco use in 30 sub-Saharan African countries "Two articles from the top ten cited articles were published in the International Journal of Drug Policy and BMC Medicine, Medicine for Global Health.

Table 3. Ten most highly cited authors in alcohol and substance use prevention in Africa

Country	Name of author	Citation	Rank
South Africa	Wechsberg et al., 2008	105	1
Zambia	Beard et al., 2010	44	2
South Africa	Meade et al., 2015	36	3
Zimbabwe	Cubbins et al., 2012	36	4
Kenya	Embleton et al., 2013	26	5
South Africa	Onya et al., 2016	21	6
Kenya	Papas et al., 2012	16	7
South Africa	Kooman et al., 2008	13	8
South Africa	Watt et al., 2017	10	9
Tanzania	Ratliff et al., 2016	9	10

DISCUSSION

The review established that the annual research productivity in the field of alcohol and substance use prevention research has witnessed a significant increase in the past decade. The increased number of publications may be due to: the number of frequent alcohol users and other illicit substance users has been increasing in Africa due to more recently, trafficking in heroin and cocaine despite the existing legal control measures[17-19].

The review also noted that there were few collaborations among Africans themselves. If frequent, these collaborations would enhance future alcohol and substance use prevention research productivity through responding to African community needs and expanding programs that will benefit African communities and researching solutions for local concerns. There might be a danger that more powerful research partners from the developed world might exploit the vulnerability of the developing country scientists by focusing research on priority interests of the foreign funding establishments rather than on the urgent needs of the host country[20]. Despite the stated drawback, International collaborations have the advantage of having access to innovative approaches to problem-solving and acquire expertise beyond that which your research group covers. International collaborations are also handy in establishing a worldwide network of colleagues with a variety of cultural and scientific backgrounds[21-22]. Because of the uneven power, there is the danger that the more powerful partners from the developed country could exploit the weakness of the developing country scientists and institutions: perhaps by focusing research on priority interests of sponsoring foreign institutions rather than on the urgent needs of the host country.

Publications were primarily from specialty journals that focused on alcohol and substance use. The nucleus journals were for alcohol and substance use: International Journal of Drug Policy, Drug and Alcohol Dependency, and Journal of alcohol and alcoholism with an impact factor of 4.2, 3.9, and 2.7, respectively. Subscription to such journals in indexing and abstracting would yield benefits scientifically[23].

The most active institutions are from South African Universities, followed by Moi University from Kenya. The prevalence of alcohol and substance use and the available resources for research would justify this position in the ranking. These are the same Universities where the authors are coming from.

LIMITATIONS

One huge limitation of the bibliometric analysis is that it does not measure the quality of research outputs. No database of scientific research will cover all publications, and some fields may suffer more than others. Another limitation of this study was language bias due to the selection of English-only articles.

CONCLUSIONS

The size of literature in alcohol and substance use showed a noticeable increase in the past decade. South Africa takes the lead with the highest number of published literature, h-index as well as international collaborations. Few African collaborations were noted, yet these collaborations would enhance future alcohol and substance use prevention research productivity. No articles from Central Africa were identified, and this could be because most of the countries there are French-speaking, which was our exclusion criteria. Given the large volume of citations received in this field, it is expected that applications of alcohol and substance use prevention research will be seen in various health aspects and health services. Research in alcohol and substance use prevention needs to be encouraged, particularly in the fight against AIDS, crime, and other social ills in Africa.

DATA ACCESS

All data present in this article can be retrieved from the WoS, EBSCOhost, and PubMed using keywords listed in the methodology.

ACKNOWLEDGMENTS

None

AUTHOR CONTRIBUTIONS

Conceptualisation: **RT**

Data curation: **RT**,

Data extraction, analysis and presentation: **RT, LMM, MSM, JTK, LG, ET & PM**

Methodology: **RT**

Writing - original draft: **RT, LMM, MSM, JTK, LG, ET & PM**

Writing - review and editing: **RT, LMM, MSM, JTK, LG, ET & PM**

COMPETING INTEREST:

The authors declare that they have no competing interests.

FUNDING

None

BIBLIOGRAPHY

1. Pritchard A. Statistical Bibliography or Bibliometrics? J Doc. 1969;25(4):348–9.
2. Smith LC. Citation analysis. Libr Trends. 1981;
3. Koskinen J, Isohanni M, Paajala H, Jääskeläinen E, Nieminen P, Koponen H, et al. How to use bibliometric methods in evaluation of scientific research? An example from Finnish schizophrenia research. Nord J Psychiatry [Internet]. 2008 Jan 12 [cited 2019 Jul 30];62(2):136–43. Available from: http://www.tandfonline.com/doi/full/10.1080/08039480801961667
4. Smith K. Beyond Evidence-Based Policy in Public Health: The Interplay of Ideas. Palgrave Macmillan. Basingstoke, UK; 2013. 1–121 p.
5. Briganti M, Delnevo CD, Brown L, Hastings SE, Steinberg MB. Bibliometric Analysis of Electronic Cigarette Publications? 2003 – 2018. Int J Environ Res Public Health. 2019;16(320).
6. Nieminen P, Miettunen J, Koskinen J, Isohanni M, Jääskeläinen E, Paajala H, et al. How to use bibliometric methods in evaluation of scientific research? An example from Finnish schizophrenia research. Nord J Psychiatry. 2008;62(2):136–43.
7. Hanna FB. Alcohol and substance use in humanitarian and post-conflict situations. Action Ment Brain Disord [Internet]. 2017 [cited 2019 Jun 21];23(3). Available from: http://applications.emro.who.int/emhj/v23/03/EMHJ_2017_23_03_231_235.pdf?ua=1&ua=1
8. WHO. Global status report on alcohol and health [Internet]. Geneva; 2018 [cited 2019 Jun 21]. Available from: https://apps.who.int/iris/bitstream/handle/10665/274603/9789241565639-eng.pdf
9. Renstrom M, Ferri M, Mandil A. Eastern Mediterranean Health Journal La Revue de Santé de la Méditerranée orientale 198 1 World Health Organization [Internet]. Vol. 23. 2017 [cited 2019 Jun 22]. Available from: http://applications.emro.who.int/emhj/v23/03/EMHJ_2017_23_03_198_205.pdf?ua=1&ua=1
10. Botvin GJ, Griffin KW. Prevention of substance abuse. In: APA handbook of clinical psychology: Applications and methods (Vol 3). 2016. p. 485–509.
11. Mbwambo J, McCurdy SA, Myers B, Lambdin B, Kilonzo GP, Kaduri P. Drug trafficking, use, and HIV risk: The need for comprehensive interventions. Sahara J. 2012;9(3):154–9.
12. Tadmouri GO, Bissar-Tadmouri N. A major pitfall in the search strategy on PubMed. Saudi Med J. 2004;25(1):7–10.
13. Falagas ME, Pitsouni EI, Matietzis GA, Pappas G. Comparison of PubMed, Scopus, Web of Science, and Google Scholar: strengths and weaknesses. FASEB J. 2008;22:338–42.
14. Kulkarni A V., Aziz B, Shams I, Busse JW. Comparisons of citations in web of science, Scopus, and Google Scholar for articles published in general medical journals. JAMA - J Am Med Assoc. 2009;302(10):1092–6.
15. De Granda-Orive JI, Alonso-Arroyo A, Roig-Vázquez F. Which data base should we use for

our literature analysis? Web of Science versus SCOPUS. Arch Bronconeumol. 2011;47 (4):213.
16. Brooks S. Journal access models & journal comparison services. White Paper. 2010.
17. Affinnih YH. Revisiting Sub-Saharan African countries' drug problems health, social, economic costs, and drug control policy. Subst Use Misuse. 2002;37(3):265–90.
18. Odejide AO. Status of drug use/abuse in Africa: A review. Int J Ment Health Addict. 2006;4(2):87–102.
19. Dewing S, Plüddemann A, Myers BJ, Parry CDH. Review of injection drug use in six African countries: Egypt, Kenya, Mauritius, Nigeria, South Africa and Tanzania. Drugs Educ Prev Policy. 2006;13(2):121–37.
20. Lucas AO. International collaboration in health research. Bull World Health Organ. 2005;83(7):482.
21. de Grijs R. Ten Simple Rules for Establishing International Research Collaborations. PLoS Comput Biol. 2015;11(10):1–7.
22. Freshwater D, Sherwood G, Drury V. International research collaboration: Issues, benefits and challenges of the global network. J Res Nurs. 2006;11(4):295–303.
23. López-Illescas C, de Moya-Anegón F, Moed HF. The actual citation impact of European oncological research. Eur J Cancer. 2008;44(2):228–36.