BIBLIOMETRIC ANALYSIS OF PUBLISHED ARTICLES IN PAKISTAN ARMED FORCES MEDICAL JOURNAL (PAFMJ)

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KEYWORDS	ABSTRACT
Bibliometric Analysis, Citations, Publication, Pakistan Armed Force Medical Journal	The introduction of bibliometrics was first documented to Prichard in 1969. It can be defined as the systematic organization, arrangement, and quantitative assessment of journal patterns within both macro and micro-scale structures, including an analysis of authorship through the mathematical and statistical methods. The retrospective study was conducted at AFIC/NIHD, Rawalpindi, the data spanning from 2018 to 2022. Total number of research papers from 2018 to 2022 was 2475, including of 2332 original articles, 36 review articles and 107 case reports. The annual number of publications ranged from 343 to 633. The xaximum number of publications 633, (25.58 %) were in year 2021. Highest number of original articles 168, (7.20%) was published with issue no: 72(5) in year 2022. The yearly issue numbers for PAFMJ have gradually risen over the years. In this regard, the primary form of research paper published in the PAFMJ consists of original articles. The present study comprehensively analyzed publication pattern, citation patterns and national and international citation patterns on the issue number and yearly basis. In this connection, the PAFMJ revealed that the international citations are higher than the national citations.
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INTRODUCTION

The introduction of bibliometrics was first documented to Prichard in 1969. It can be defined as the systematic organization, arrangement and quantitative assessment of the journal patterns within both macro and micro-scale structures, including an analysis of the authorship through mathematical & statistical methods (Guido, Morandi, Palluzzi & Borroni, 2015). Bibliometrics,

a specialized discipline within information science, is concerned with quantitative assessment of research efficiency and the analysis of publication patterns, particularly authorship trends. It is useful tool frequently employed to chart direction of scientific research, examine authorship arrangement, assess research collaborations and measure author efficacy across diverse fields of knowledge. In context of social science research, bibliometrics appears as famed instrument, facilitating a methodological analysis of publication outputs in any given subject area (Smita & Vaishali, 2016).

Bibliometric analysis pertains to methodological field concentrated on structural examination of information within scientific publications. It offers range of indicators to researchers, aiding in systematic analysis of data. This approach enables the monitoring of literature growth and research patterns. Bibliometric study is quantitative method used to assess impact, efficiency, and trends within specific scientific domain. By examining the publication output and citation patterns of a journal, researchers can gain valuable insights into development and influence of technical research in particular field. A bibliometric learning of reference works in the sciences as well as social sciences. Evaluating citation patterns and the characteristics of highly cited references, provides insights into the use of references in the scholarly publications (Glänzel & Schoepflin, 1999).

Bibliometrics has shown significant potential in various research areas, particularly within the healthcare sector. It serves as valuable instrument for healthcare professionals and researchers to assess and improve academic trends. The continuously developing medical background consistently produces impactful developments and research outcomes that improve patient care. The effective dissemination of this vital knowledge is principal for maximizing the value of research efforts, and scientific journals play a central role in confirming timely and extensive sharing of these valuable insights (Primo & Gazzola, 2014). Researchers utilize bibliometric analysis for the number of purposes, including identifying new trends in the performance of the articles and journals, patterns of collaboration, and research components, and investigating the intellectual framework of the particular field and scope in the body of existing literature (Donthu, 2020).

LITERATURE REVIEW

Greener (2022) addresses the use of bibliometric analysis. Its study acknowledging importance of bibliometrics in identifying the research trends and prominent authors. Bachchhav (2022) described bibliometric study of the annals of library and information studies, and bibliometric learning explores publication pattern and overview of journal scholarly output. Wijewickrema (2023) described the Bibliometric study of research progress in the intersection of the library and information science with information systems (IS). The study reveals growing interest in collaborative research and the highest citations for documents in information management. It analyzes the number of articles citation patterns. Mayta, Vicuña, Lazo, Munive, Guerrero and Mendoza (2023), describe bibliometric study of international dental journal. The study identify the number of research publications, most productive organizations, type of partnership, most

productive countries, most cited research papers, and authors with highest academic creation were reported.

Swain (2005), revealed that bibliometric analysis evidences valuable in this context by focus highly cited journals, patterns of author productivity, journal impact factors, and other related attributes within the specific literature under examination. Kurichi, (2005) Several medical research has been conducted in the Western nations to assess advancements and fundamental trends in the range of medical journal-based research. Sharan and Saxena (2006), in the context of bibliometric study of the medical journals, it is worth mentioning that the authors from developing countries in meeting publication standards and developing nations significantly trail behind more developed counterparts. Momen (2004) The capable analysis of published data and limited involvement of researchers from developing countries in conducive to global scholarly output represent acknowledged issues that require attention and resolution. Saleem, Pervaiz, Baig, Khan and Malik (2018), five-year bibliometric study of Pakistan armed forces medical journal from (2011- 2015) shown increased research efficiency and growing interest in the field.

It also highlighted the importance of raising collaboration among researchers across various disciplines while the analysis from 2011 to 2015 provided valuable insights, there is a research gap in understanding the following developments with national and international citations and further more five years trends from 2018 to 2022 in PAFMJ research landscape. To address this gap, further bibliometric analysis covering the years 2018 to 2022, including both national and international citations, is necessary to assess the developing efficiency, research interests, and collective efforts within journal. The aim of this research was to address acknowledged issues of knowledgeable analysis of published data and limited contribution of researchers from emerging countries in the global scholarly output. The purpose was to fulfill the existing research gap by conducting a comprehensive bibliometric study of the Pakistan Armed Forces Medical Journal (2018 to 2022). This analysis provides insights into growing output, research interests, and collaborative activities within journal during this five-year period, contributing to a better understanding of its scholarly impact and potential areas for improvement and to determine the growth in the sense of strength and weakness of PAFMJ during years from 2018 to 2022.

RESEARCH METHODOLOGY

The retrospective study was conducted at AFIC/NIHD, Rawalpindi, the data spanning from 2018 to 2022. After obtaining approval from the Institutional Ethical Review Board (IERB) letter no.9/2/R&D/2023/287). The basic objective of the study is to conduct a five-year bibliometric study of Pakistan Armed Forces Medical Journal (2018 to 2022). This study is conducted at Armed Force Institute of Cardiology /National Institute of Heart Diseases, Rawalpindi. The data of all published articles of Pakistan Armed Forces Medical Journal (PAFMJ) from 2018 to 2022 excluding editorials and letters to editor, was collected from the database and official website of PAFMJ. The inclusive criteria involve original articles, case reports, review articles

and case series. The exclusive criteria comprise editorials, letters to editorials and conference papers.

Data concerning all the journals (original articles, review articles, case reports and case series) excluding editorials, letters to the editor and Conference Abstracts in PAFMJ from 2018 to 2022 was collected from the journals and official website of PAFMJ. In this linking, data regarding , total publications, co-authored publications, total citations, average citations, numbers of cited publications, citation per cited publication, range and number of citations per article and range and number of national and international citations was noted on data collection form of the study. The collected data was organized and input into the Statistical Package for the Social Sciences (SPSS) version 23.0. similarly, percentages and proportions of various variables were determined and Graphical presentations, including bar charts, pie charts and histograms, were employed.

DATA ANALYSIS

Total number of publications from 2018 to 2022 were 2475 including 2332 original articles, 36 review articles and 107 case reports. The annual number of publications span from 343 to 633. The highest volume of publications, totaling 633 (25.58%), was recorded in year 2021, closely followed by 618 publications (24.97%) in subsequent year, 2022. Conversely, lowest publication count, amounting to 343 (13.86%), occurred in the year 2019. Total number of cited publications issues from 2018 to 2022 was 1948 including 1885 original articles, 43 review articles and 20 case reports. The annual number of cited publications span from 82 to 617. The highest count of cited publications, reaching 617 (31.67%), occurred in the year 2020, followed by 504 citations (25.87%) in preceding year, 2019. The lowest count, totaling 82 (4.21%), was observed in the year 2022.

Majority of the papers had an average of 01-05 citations 1380, (70.84%), remaining publications have an average of 06-30 citations 568, (29.16%). Majority of the publications have an average of 01-05 national citations 698, (89.37%), remaining publications have an average of the 06-15 citations 83, (10.63%). Majority of the research papers have an average of 01-05 international citations 873, (74.81%), remaining publications have an average of 06-20 citations 294, (25.19%). Maximum number of original articles 168, (7.20 %) was published with issue no: 72(5) in year 2022. Maximum number of case reports 15, (14.02%) was published with issue no: 72 (5) of year 2022. Maximum number of review articles 8, (22.22%) was published with issue no: 70(3) in year 2020. Range and percentage of national citations and international citations is present at the end of each publication were also computed, provided in the tables I, II at the end of this document.
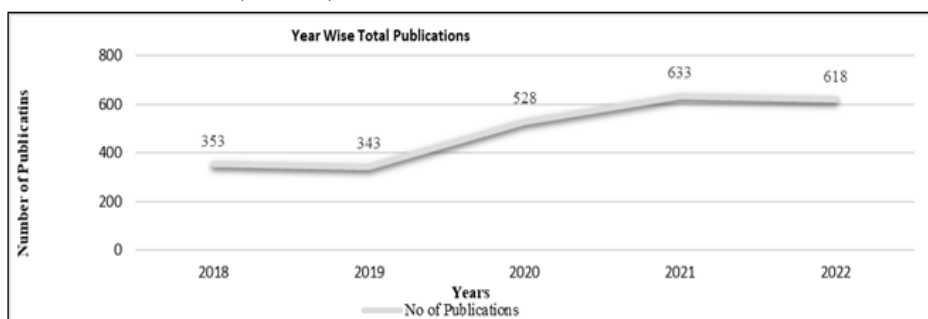
DISCUSSION

In current background of advancing medical science, it is crucial for healthcare professionals to possess open access to reliable scientific information. Praveen, Pasupuleti, Penmetsa, Nagisetti, Indukuri and Akkaloori (2022), in current background of advancing medical science especially in dental research, the study reveal increasing trend in publications. It is crucial for healthcare

professionals to possess the open access to reliable scientific information. In this connection, the facilitation of this access is an essential role assumed by the scientific journals (Praveen et al., 2022).

Figure 1
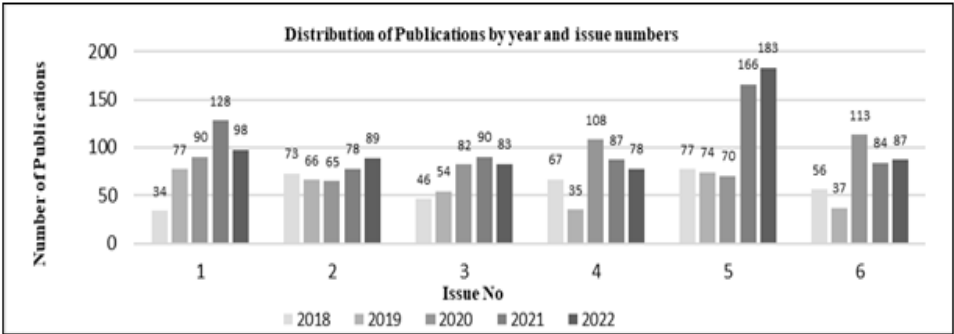*Year wise Total Publications (n=2475)*

The scientific insights spread through medical journals offer evidence-based guidelines that capture existing movements in the examination and treatment of diseases. Thus, application of bibliometric study to medical journals assumes greatest significance in comprehensive results indicate a fluctuating publication trend and the journal has experienced a notable increase in published articles in the recent years (Miljkovic, 2019). The scientific searches undertaken by researchers serve as the guide of the nation's scientific progress. In this context, the bibliometric analysis occurs as an essential tool for appraising the scientific activities documented within Pakistani medical journals and it have published the significant number of COVID-19-related publications.

The focus of the paper is on bibliometric analysis of COVID-19 publications in Pakistani medical journals, revealing a majority of articles published in 2021 and 2022, with 99% being original articles (Ullah, 2023). Bibliometric analyses find application in both medical and non-medical domains. The bibliometric analysis of publications by authors associated with Army Medical College, Pakistan, using Scopus database from 1977 to 2018. Findings reveal 417 publications with an average of 9.92 papers per year, cited 2,524 times, and citation impact of 6.05 per year. The majority of publications (68%) were in the field of Medicine (Haq, Ullah & Tanveer, 2020). The bibliometric analysis highlights notable expansion in both publication and citation metrics (Donthu, 2021).

A scarcity of bibliometric studies has historically deferred the exploration of the significance of scientific journals in Pakistan (Javed & Shah, 2008). Significant progresses are needed in the bibliometric field in Pakistan to provide active contribution for attractive current research activities. In addition to its application in medical sciences, bibliometrics holds relevance in various other fields. A study covering a bibliometric analysis of the Journal of Pakistan Medical Association from 1965 to 2018 using Scopus, focusing on citable documents. Study concludes

that the journal has witnessed a continuous rise in publications, citations, and impact factor, attracting a broader audience, the study evidenced by the analysis of the highly cited papers (Memon AR 2019). In this study the analysis included an examination of international and national citation patterns within the medical publications and citation to publication ratio. The prior documentation reveals the absence of any conducted analysis on the specified journal to date.

Figure 2

Classification of Publications by year and issue numbers (n=2475)

For a journal, the quantity of issues serves as an indicator of its fundamental research capacity, to illustrating the issue number and volume of research papers produced within a definite time limit (Baek & Yoon, 2014). The data obtained from our current bibliometric study indicates a steady increase in both the per year number of the publication issues and published articles for PAFMJ, reaching its present status of six issues. Similar trends have been identified in previous bibliometric studies (Watari, 2022). Present study, articles with an average of (01-05) citations held the maximum sites, whereas those with an average of over 20 citations as classified the lowest number of citations in the list. These results support with the detection of citation and publication trend over the years, indicating a growing attention among health professionals in research work. This is the reflecting progress rate over time as indicated by references (Rao & Khan, 2010).

Table 1

Distribution of Publications by National Citation Range and Percentage

Citation intervals	Publications
1-5	698 (89.37)
6-10	71 (9.09)
11-15	12 (1.54)

Table 2

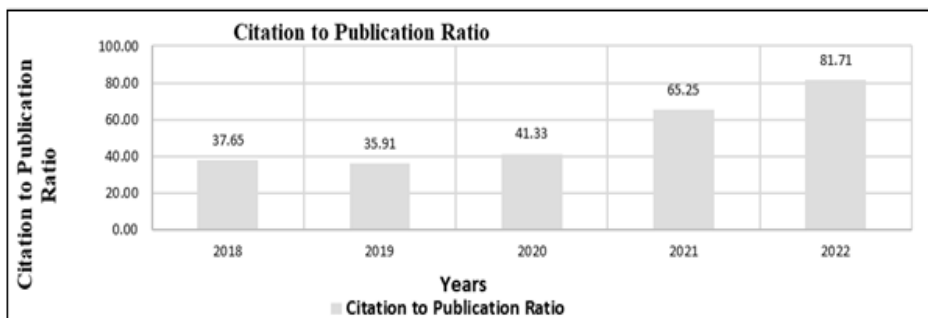*Distribution of Publications by International Citations Range and Percentage*

Citation intervals	Publications

1-5	873 (74.81)
6-10	199 (17.05)
11-15	76 (6.51)
16-20	19 (1.63)
Total	1167 (100.00)

Another study presents a thorough bibliometric study covering the 100 most frequently cited research papers in the Journal of Oral Pathology & Medicine (JOPM) from 1972 to 2020. The assessment aims to explain significance and Impact of research within the journal, featuring key metrics including citation range (95 to 1,459) for top 100 articles. Moreover, the analysis includes insights into the authorship, affiliations, publication years and countries of the origin associated with these highly cited articles (Arakeri, Patil, Quadri, Alqahtani, Rao, Fonseca & Brennan, 2021).

Figure 3

Citation to Publication Ratio.

The results from Graph No: 03, indicate a decrease of 1.74 in the difference of the citation to publication ratio from 2018 to 2019. Besides, for the consequent periods—2019 to 2020, 2020 to 2021, and 2021 to 2022 differences are 5.42, 23.92 and 16.46, separately. The continuous upward trend noticed in Citation to Publication Ratio during these years suggests that on average, each publication is getting an increasing number of citations. The analysis focuses on how the many components of research interact intellectually and structurally. The citation analysis, co-citation analysis, co-authorship analysis, bibliographic coupling, and co-word analysis are some of the methods used in science mapping. The presentation of bibliometric structure and intellectual structure of study field is greatly aided by blend of these techniques with the network analysis (Baker et al., 2020).

CONCLUSION

PAFMJ has achieved a significant milestone of almost 65 years of publication, representing a positive way in efficiency with increased volume output per year. The journal covers various fields of basic and medical sciences, highlighting a growing interest among doctors in research

activities. The journal has served as a source of inspiration for emerging researchers within the Army Medical institutes, encouraging active participation and sharing of research outcomes for evaluation and application. PAFMJ serves as excellent platform for researchers to conduct medical research within their specialized fields, attracting not only Pakistani researchers but also those from abroad. Over past few years, PAFMJ has tripled its research publications. This highlights significant impact of PAFMJ on field of medical research, highlighting the strength and significance of its contributions. Within the medical domain, PAFMJ stands out as leading medical journal, excelling in all aspects of scholarly publication. This study comprehensively analyzes citation patterns, ranges and trends, providing volume-wise classification. Moreover, it explains national and international citation patterns on patterns on issue number and yearly basis. The study emphasizes superiority of the PAFMJ by revealing higher rate of international citations in comparison to national citations, an evidence to journal's global impact and strong standing.

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