

# Medical Document Analysis Report

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## Introduction

The Indian Subcontinent countries included in this study were India, Pakistan, Bangladesh, Nepal, and Sri Lanka, as other three countries of this region (Afghanistan, Bhutan, and Maldives) have made very small contributions. We have divided the above 5 countries in two groups: "India" and four "Select Indian Sub-continent countries" (Pakistan, Bangladesh, Nepal, and Sri Lanka). Since India's contribution is much higher than the combined output of other four other Indian Subcontinent countries, we separated it as a single country for comparison with the "Select Indian Subcontinent countries" in this study for analysis and presentation. Any bibliometric study on the Indian Subcontinent generally highlights the core contribution and major players (organizations, authors, journals and keywords) in any field. India being the dominating country in publication output is, therefore, likely to be highlighted. In this study, we shall highlight the contribution of both the groups.

the following: (1) the conception and design of the study, or acquisition of data, or analysis and interpretation of data, (2) drafting the article or revising it critically for important intellectual content, (3) final approval of the version to be submitted. No writing assistance was obtained in the preparation of the manuscript. The manuscript, including related data, figures and tables has not been previously published and that the manuscript is not under consideration elsewhere. All authors approve the final version of the manuscript, including the authorship list and agree to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved. Conflicts of Interest The authors have no conflicts to disclose.

India being the dominating country in publication output is, therefore, likely to be highlighted. In this study, we shall highlight the contribution of both the groups together and independently in overall Indian Subcontinent output. RESULTS Publications From Indian Subcontinent The publications output on NAFLD from Indian subcontinent consisted of 1053 papers, of which India contributed 856 papers (81.3%) and "Select Indian Subcontinent" 219 (18.7%) papers. There has been a progressive increase in the number of publications from the Indian Subcontinent (Figure 1). The Indian Subcontinent's (i) annual contribution increased from 1 in 2001 to 192 papers in 2022, registering

the 28.95% annual average growth rate and (ii) cumulative contribution increased from 145 during 2001–12 to 908 papers during 2013–22, registering 526.21% absolute growth (Supplement 1). Within Indian Subcontinent, (i) India's contribution increased from 5 in 2004 to 192 papers in 2022,

senting the literature of liver disease caused by alcohol are constructed and visualized. Structure and temporal dynamics are identified in terms of the most active topical areas and cited references. Using bibliographic coupling analysis and clustering analysis, the authors identified BIBLIOMETRIC ANALYSIS OF PUBLICATIONS VAISHYA ET AL 10 © 2023 Indian National Association for Study of the Liver. Published by Elsevier B.V. All rights reserved. ---

their research areas and to collaborate closely with each other. All these 50 authors have 455 links and 1135 TLS. Significant Keywords It is generally observed through other bibliometric studies<sup>11</sup> that keywords independently or in combination with other keywords represent important concepts and their co-occurrence helps us to understand important areas of research. Among 1053 Indian Subcontinent's publications on NAFLD research, 2365 authors' keywords appeared which have frequency of occurrences varying from 1 to 933. From these author keywords, we have identified 50 most significant keywords, with frequency of occurrences ranging from 49 to 933 (Supplement 3). The leading keywords by their frequency of co-occurrence were NAFLD (933), NAFLD (371), obesity (340), liver cirrhosis (289), alanine aminotransferase (279), body mass (248), fatty liver (247), aspartate aminotransferase (238), NASH, (234), diabetes mellitus (217), insulin resistance (199), liver fibrosis

## Clinical Findings

Research (PGIMER), Chandigarh (10.64%), All India Institute of Medical Sciences (AIIMS), ND and Institute of Liver & Biliary Diseases (IL&BS), ND (7.03% each) being at the top (Table 2). (B) 18 organizations registered CPP and relative citation index (RCI) more than their group average (36.84 and 1.58): University of Delhi (156.5 and 6.69), G.B. Pant Hospital, Delhi (118.29 and 5.06), and Indraprastha Apollo Hospital, New Delhi (87.2 and 3.73) were the leading institutions (Table 2). Table 1 Statistics on Total Papers, Total Citations and Citations Per Paper From Indian Subcontinent. Region/Selected key word based on countries Publications/Citations 2001–2012 2013–2022 2001–2022 India Total papers 126 730 856 Total citations 5426 17,039 22,465 Citations per paper 43.06 23.34 26.44 Select Indian Subcontinent Total papers 20 199 219 Total citations 1192 3755 4947 Citations per paper 59.60 18.87 22.59 Indian Subcontinent Total papers 145 908 1053 Total citations 5784 18,911 24,695

the Indian Subcontinent, and their findings and recommendations can then be applied effectively to the patients from these countries. There are a few limitations in the present study. First, only one Scopus database was searched for analysis. Other databases such as WOS, Dimension, PubMed, and so on could have been used to make this search comprehensive. JOURNAL OF CLINICAL AND EXPERIMENTAL HEPATOLOGY Journal of Clinical and Experimental Hepatology | January–February 2024 | Vol. 14 | No. 1 | 101271 11 ---

mid (4 papers each), M. Al Mahtab and S. Hamid (2 papers), R.K. Dhiman, A.K. Duseja, A. Goel, P. Jain, S. Rahman, S. Alam, and Z. Abbas (2 papers each). There is a moderate collaboration among these Indian Subcontinent organizations, with the collaborative linkages varying from 1 to 8. The 22 ICPs were published in 16 journals, with 4 papers in Hepatology International, 2 papers each in Clinical Gastroenterology & Hepatology and Lancet Gastroenterology & Hepatology, and 1 paper each in 13 other journals.

**DISCUSSION** A few bibliometric studies are available on various aspects of NAFLD and related sub-fields mainly at global level. Among the specific studies on this topic, Zhang et al. (15) examined the global publications trends and the research hotspots of NAFLD using Web of Science (WOS) database during 1986–2013. This publication covered 6356 articles, which were published in 994 different journals covering 93 Science Citation Index (SCI) subject categories. Bibliomet-

But, the use of multiple databases involves a lot of problems in standardizing the data as most have their own formats and extent of information covered. Since most bibliometric studies involve one database, as a result, we restricted the present study to one database. Although the bibliometric indicators provide valuable information, these may be taken out of context and applied without a full knowledge about the bibliometric research, on which they are based.<sup>35</sup> Overall, despite a high prevalence of NAFLD in Indian Subcontinent, the research output on this medical problem is low, with 3.43% global share. The regional cooperation and research collaboration between the Indian Subcontinent countries is also poor. India has led the list of publications with 81.3% contributions. Further, HCPs from Indian Subcontinent are low (3.61%). More regional and international collaboration and external funding is required to enhance the number and quality of research and publication.

50.91 CPP, respectively. The largest international participation (52.12% share) in the Indian Subcontinent's output came from the USA, followed by U.K. (19.69% share), Japan (19.31% share), and China (17.37% share). Among 259 ICPs from the Indian Subcontinent, the share of bilateral and multilateral collaborative papers was 54.05% (140) and 45.95% (119), respectively. Among 1053 papers, the majority of 63.82% appeared as research articles, followed by 20.99% as reviews. The major focus of papers on NAFLD was on adults, middle-aged, and aged (87.56%). The majority of papers were clinical studies (43.49%), followed by paper based on pathophysiology (10.92%) and epidemiology (9.88%). Controlled studies accounted for the largest share ( $n = 348$  and

33.05%) of papers, followed by cross-sectional studies ( $n = 120$  and 10.40%), follow-up studies ( $n = 111$  and 10.54%), prospective studies ( $n = 99$  and 9.40%), retro-spective studies ( $n = 77$  and 7.31%), cohort studies or anal-

## Summary

This bibliometric analysis, focusing on publications related to Non-Alcoholic Fatty Liver Disease (NAFLD) from the Indian Subcontinent between 2001 and 2022, reveals a disproportionately low research output (3.43% of global share) despite the high prevalence of NAFLD in the region. The study, limited to the Scopus database, highlights the need for increased regional and international collaboration, as well as external funding, to enhance both the quantity and quality of research.

India leads in the number of publications (81.3% of the region's output). Key institutions contributing to NAFLD research include the Postgraduate Institute of Medical Education and Research (PGIMER), Chandigarh, and the All India Institute of Medical Sciences (AIIMS), New Delhi, and Institute of Liver & Biliary Diseases (IL&BS);, ND. However, institutions such as the University of Delhi, G.B. Pant Hospital, Delhi, and Indraprastha Apollo Hospital, New Delhi, demonstrate higher citation per publication (CPP) and relative citation index (RCI) compared to the group average.

Collaborative linkages are primarily observed among authors within the same institute or across highly collaborative organizations. Prominent authors involved in international collaborative papers (ICPs) include A.K. Duseja, S.K. Sarin, and W. Jafri.

The analysis of research types reveals a predominance of review articles, followed by meta-analyses, cross-sectional studies, and follow-up studies. Non-invasive imaging techniques frequently employed include nuclear magnetic resonance, transient elastography, and computer-assisted tomography.

The study underscores the importance of increasing data collection from all world regions to improve the understanding of the burden of disease associated with NAFLD and NASH worldwide. Improving our understanding of the burden of NAFLD can facilitate the development of healthcare policies and strategies to slow this epidemic.