

Progress and trends in healthcare marketing strategy (2018–2022): A descriptive and bibliometric analysis of the Web of Science (WOS) dataset

Web of Science
(WOS) data set

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Received 12 December 2022
Revised 21 June 2023
Accepted 8 December 2023

Abstract

Purpose – Health-care marketing typically entails a coordinated set of outreach and communications designed to attract consumers (patients in the health-care context) who require services for a better health outcome and guide them throughout their health-care journey to achieve a higher quality of life. The purpose of this study is to understand the progress and trends in healthcare marketing strategy (HMS) literature between 2018 and 2022, with a special emphasis on the pre- and post-Covid-19 periods.

Design/methodology/approach – The authors examine 885 HMS-related documents from the WOS database between 2018 and 2022 that were extracted using a keyword-based search strategy. After that, the authors present the descriptive statistics related to the corpus. Finally, the authors use author co-citation analysis (ACA) and bibliographic coupling (BC) techniques to examine the corpus.

Findings – The authors present the descriptive statistics as research themes, emerging sub-research areas, leading journals, organisations, funding agencies and nations. Further, the bibliometric analysis reveals the existence of five thematic clusters: Cluster 1: macroeconomic and demographic determinants of healthcare service delivery; Cluster 2: strategies in healthcare marketing; Cluster 3: socioeconomics in healthcare service delivery; Cluster 4: data analytics and healthcare service delivery; Cluster 5: healthcare product and process innovations.

Research limitations/implications – This study provides an in-depth analysis of the advancements made in HMS-related research between 2018 and 2022. In addition, this study describes the evolution of

The authors thank the Indian Institute of Management Ahmedabad for providing the required support to conduct this study.

Author contributions: R.K. and A.W. conceived the presented idea. R.K. developed the theory, verified the analytical methods and performed the computations. R.K. and A.W. jointly discussed and interpreted the results and contributed to the final manuscript.

Funding: There are no funding sources to report.

Availability of data and materials: This study uses data from the Web of Science (WOS) and can be downloaded by following the steps provided in the methods section.

Declaration of conflicting interests: The authors declare no potential conflicts of interest with respect to the research, authorship and/or publication of this article.

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research in this field from before to after the Covid-19 pandemic. The findings of this study have both research and practical significance.

Originality/value – To the best of the authors' knowledge, this is the first study of its kind to use bibliometric analysis to identify advancements and trends in HMS-related research and to examine the pattern before and after Covid-19 pandemic.

Keywords Public policy, Bibliometric analysis, Covid-19, Cluster maps, Descriptive statistics, Healthcare marketing strategy

Paper type Research paper

1. Introduction

Healthcare marketing is a branch of marketing that uses the strategies and principles of commercial marketing to promote healthcare products and services. Healthcare professionals consider health services in technical terms, whereas consumers often emphasize the non-technical components of service delivery (Flexner and Berkowitz, 1979). What makes healthcare marketing a great art is this changing and delivery of complex technicalities into unadorned language that consumers understand. Healthcare marketing, according to the Centers for Disease Control and Prevention, is:

[...] creating, communicating, and delivering health information and interventions using consumer-centred and science-based strategies to protect and promote the health of diverse populations (Bernhardt, 2006).

It is a multi-disciplinary field which draws inspiration from multi-fold disciplines such as health education, social marketing, sociology and psychology, instructional design and the creation of multimedia products, among others. For effective marketing of healthcare products and services, marketers need to identify in-depth patients' latent needs and predict the required services without asking explicitly for them (Purcarea, 2019). A healthy population is a proxy for effective healthcare marketing strategy (HMS) implementation (Coculescu *et al.*, 2015).

The Covid-19 pandemic necessitated the need to develop innovative and new HMSs to meet the patients' unmet needs. A major roadblock was the lockdown implemented by various governments worldwide, which led to people's limited mobility to visit retail shops such as pharmacies and healthcare centres (Renu, 2021). Consumers were challenged to re-evaluate their life priorities, giving rise to new spending criteria (Hoekstra and Leeftang, 2020). Since consumer behaviour was altered due to the restrictions imposed, the pre-existing marketing strategies and their implementation also had to be altered and fine-tuned to meet consumer expectations. Evidence from during (and after) the pandemic shows the diverse marketing strategies that could be deployed during downturns and their larger social impact. (Dekimpe and Deleersnyder, 2018). Nonetheless, the pandemic has drawn a line where HMSs have drastically evolved from what was before and what is after.

Extant literature is replete with studies that explore a range of different marketing strategies in the context of healthcare. However, limited studies provide a comprehensive summary of the progress and trends in HMSs over the years. Moreover, to the best of our knowledge, no such study examines the impact of the pandemic on the changing nature of HMSs. Our study attempts to address this gap in the literature and provide actionable insights to a range of stakeholders, such as academicians, researchers, policymakers and firms. This information is extremely critical from the perspective of designing interventions that can improve the coverage of healthcare services. Our study holds special relevance in the context of low- and middle-income nations, where healthcare service delivery remains a major challenge due to the existing barriers related to accessibility and affordability.

We use bibliometric analysis to examine the publication dataset extracted from the Web of Science (WOS) database using a keyword-driven approach. We particularly focus on publications from 2018 to 2022, i.e. before and after the pandemic. First, we investigate and present our findings related to themes such as top authors, top research areas by topic, top funding agencies, top publishing journals and the contribution by nations, all relating to research in HMS. Second, we identify and report five major clusters where much of the research has concentrated in this area.

2. Literature review

Healthcare marketing has been a field of permanent evolution (Purcarea, 2019). Several factors influence marketing strategy-based decisions, and it is the right set of policies, principles and procedures that guide an institution's marketing to its target market. Incidentally, the marketing techniques and strategy of any other field cannot be directly implemented in healthcare as it requires its own approach and customization (Thomas, 2018). But the essential elements such as budget (generally a percentage of turnover), marketing mix (McCarthy's "four Ps") and distribution procedure (budget distribution to various products, customer segments and territories) remain the same (Popa *et al.*, 2008). However, the most pivotal part inevitably is its implementation, leading to superior organizational performance. Inappropriate strategies implemented excellently might end up with better outcomes than excellent strategies executed poorly (Bonoma and Shapiro, 1984). As such, there is no concurrence on the definition of marketing strategy implementation; different researchers have tried to define it in different ways. For instance, it is the application of resources to a strategy (Day and Wensley, 1983); it is the process that turns a plan into action (Kotler and Keller, 2011, p. 9).

The marketing managers and the marketing department implement the right marketing strategy on the ground. But often, the marketing managers find it challenging to detect the suitable methodology to place significant resources and investments in the correct market segment as the number of variables has increased multi-fold. The marketing manager and the department's employees are pivotal due to their contribution to determining the success of the marketing strategy implementation (Noble and Mokwa, 1999). Today, a diverse range of stakeholders, such as hospitalists, nurses, surgeons, physicians, paediatricians, neonatologists, dietitians, pharmacists and much more, influence healthcare delivery. The interactions of the various stakeholders are inter-woven, and they need to work in tandem while making critical decisions for patients. Healthcare provider companies must identify vital stakeholders and influencers who can sway many others in the surrounding healthcare community. These paramount stakeholders are highly valuable and justify special, customized services, investments and programs (Oztekin, 2018). Effective communication and the right communication mix are other vital aspects of HMS. The current and prospective patients will remain unaware of available offerings and opportunities without effective communications. Earlier, communications options were limited due to industry traditions, but recently, healthcare organizations engage large audiences by selecting the right marketing communications mix (Elrod and Fortenberry, 2018a).

Consumption is not only chronic but contextual as well. There are four significant contexts that can make or break consumer habits – social context, technological context, regulatory context and natural and manufactured context. For example, change in a social context such as marriage, the birth of a child or moving to a different city; change in technological contexts such as online retail and smartphones; change in a regulatory context; and change in natural and manufactured contexts such as earthquakes, hurricanes, civil wars and global wars can remarkably disturb the demand and supply equilibrium (Purcarea, 2019; Sheth, 2020). In fact, pandemics have disrupted the market multiple times in the past (Singer *et al.*, 2021). According to experts, with the increasing urbanization, globalization and international travel, pandemics will

re-occur (Madhav *et al.*, 2017; Saunders-Hastings and Krewski, 2016), though their severity and timing remain unpredictable (Taubenberger and Morens, 2008). Covid-19 was one such pandemic which not only altered the way of working and living of the people but also forced both large healthcare corporations and public-funded healthcare systems to change their entire strategies for dealing with it.

3. Methods

3.1 Data

WOS stands out as one of the world's leading scientific citation search and analytical databases, providing access to a wide array of scholarly publications (Birkle *et al.*, 2020; Li *et al.*, 2018). WOS is known for its high-quality standards and is one of the standard tools for conducting bibliometric research (Gaviria-Marin *et al.*, 2019, as cited in Mas-Tur *et al.*, 2021). WOS uses an algorithm that assigns one unit to each paper's co-author, one unit to each institutional affiliation, and one unit to each country, thereby prioritizing and ranking documents with multiple co-authors (Donthu *et al.*, 2020, as cited in Mas-Tur *et al.*, 2021). We consider the period between 2018 and 2022 to capture the emerging research trends and look out for trends and patterns arising in this area due to the impact of Covid-19. For the purpose of this study, we treat the period between 2018 and 2019 as pre-Covid and the one between 2020 and 2022 as post-Covid. We use a keyword-based approach to search for the required dataset. Afterwards, we refine the dataset using the "Publication Years" filter available in WOS to export publications between January 1st, 2018 and July 2022 (cut-off: July 11th, 2022) to derive the final dataset for our investigation.

3.2 Descriptive statistics

Descriptive statistics help consolidate the vast amount of data into much simpler and more manageable form (Turner and Houle, 2019). However, descriptive analysis is limited to only providing a summary of the vast datasets and stops short of drawing any inference based on probability theory (Nick, 2007, as cited in Kaliyadan and Kulkarni, 2019; Kaur *et al.*, 2018). We follow a similar approach to what has been presented by Dhamija and Bag (2020) to summarize the extracted dataset using specific descriptors such as research theme-wise, journal-wise, affiliation-wise, country-wise and funding agency-wise distribution of documents published in HMS area.

3.3 Bibliometric analysis

Bibliometric analysis is a statistical procedure that uses mathematical models to analyse datasets around a particular research area. This kind of analysis helps to measure the quality of ongoing research and predict future studies and emerging research areas (Khan *et al.*, 2021; Yu *et al.*, 2020). WOS provides in-built features to summarize the searched dataset in the form of bar and tree map charts and tables. Further, it also provides means to export the searched dataset for further examination using bibliometric analysis software (Cobo *et al.*, 2011). Accordingly, in line with van Eck and Waltman (2010), we use the Visualization of Similarities (VOS) viewer to conduct the bibliometric mapping procedures. We use techniques such as author co-citation analysis (ACA) (Small, 1973, as cited in Mas-Tur *et al.*, 2021) and bibliographic coupling (Kessler, 1963, as cited in Mas-Tur *et al.*, 2021) to examine our publication dataset.

Co-citation occurs when two documents receive a citation from the same third document, whereas bibliographic coupling occurs when two documents cite the same third document. ACA provides an understanding of how authors, as subject matter experts, establish links between published works. Clusters of co-cited papers provide novel insights into the ongoing research in a particular specialty area (Small, 1973). Over the years, the author co-citation analysis (ACA) method has been widely used by researchers while performing bibliometric analysis. ACA relies heavily on statistical tools to identify authors with similar

research interests (He and Cheung Hui, 2002). The fundamental assumption that ACA makes is that two publications, when cited together, must be highly cited (White and Griffith, 1981) and, therefore, must be condensed in a cluster on a visualization map.

Bibliographic coupling takes place when two papers cite the same third paper. As described by Martyn (1964, p. 236):

[...] two papers that share one reference contain one unit of coupling, and the value of a relationship between two papers having one or more references in common is stated as being of strength one, two, etc., depending on the number of shared references.

The methodology uses citations as fundamental units to provide information about the likenesses between two publications, authors, institutions or countries. (Mas-Tur et al., 2021). Author co-citation patterns differ significantly from bibliographic coupling patterns but generally align with patterns of direct citation. Moreover, ACA applies only to authors, while the bibliographic coupling is relevant in the context of either authors, institutions or countries, depending on the scope of the study (Chen, 2001; Mas-Tur et al., 2021).

4. Results

4.1 Primary keywords search results

Keywords are important terms documented by authors, highlighting fields, subfields, topics and issues covered in the publications, allowing their easy retrieval for relevant analysis (Tripathi et al., 2018). Initially, we chose three keyword combinations, healthcare AND marketing, healthcare AND strategy and healthcare AND marketing AND strategy, to retrieve the documents from WOS. The abstraction resulted in a total of 81,772 documents: healthcare AND marketing (12,789), healthcare AND strategy (66,943) and healthcare AND marketing AND strategy (2,048). All these documents provide information related to contributing author(s), publication year, article source, article, affiliation and abstracts of articles. Further, these documents provide range and depth across research areas such as health policy, business, management, economics and medical informatics. Table 1 below summarizes the primary keyword search results. As can be observed, the total percentage share of documents (of the complete archive of documents available in WOS) has gone up from 16.85% in the pre-Covid (2018–2019) period to 32.45% in the post-Covid (2020–2022) period. Further, this period also shows an increase in the percentage share of documents across individual categories: healthcare AND strategy (16.93%–33.80%), followed by healthcare AND marketing AND strategy (15.98%–27.40%) and healthcare AND marketing (16.58%–26.21%).

Figure 1 below shows the publication trends regarding the number of articles from 2018 to 2022 compared to the total documents (TD) available in the WOS under each keyword

Keyword combinations	No. of documents [#]			%	
	(A)	(B)	(C)	(%B of A)	(%C of A)
Healthcare AND marketing	12,789	2,121	3,352	16.58	26.21
Healthcare AND strategy	66,943	11,334	22,627	16.93	33.8
Healthcare AND marketing AND strategy	2,040	326	559	15.98	27.4
Total	81,772	13,781	26,538	16.85	32.45

Notes: A = total number of documents available in the WOS database (1989 – cut-off); B = documents published during the period 2018–2019; C = documents published during the period 2020–2022; cut-off date – 11th July 2022

Source: [#]Web of Science (WOS) database and author’s compilation

Table 1.
Primary search
results based on the
three keyword
combinations

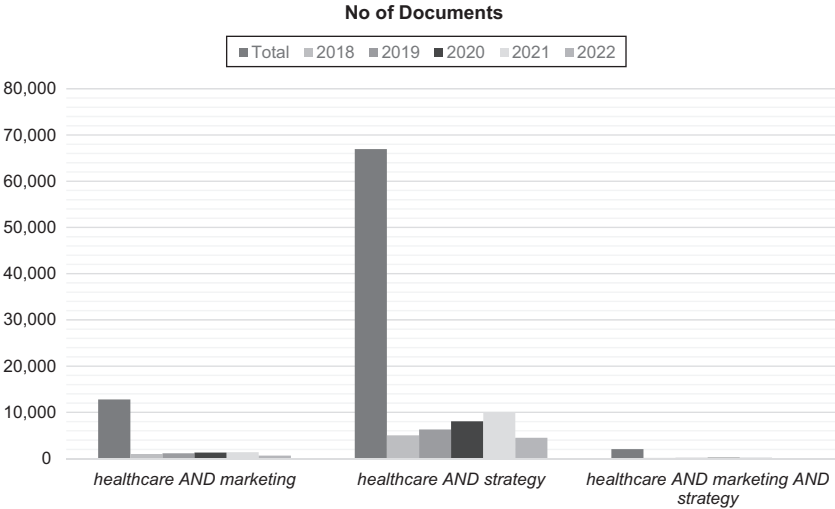


Figure 1.
Bar chart showing
year-wise publication
trend (by numbers)
based on keyword
combinations for the
period between 2018
and 2022

Note: Total: total number of documents available in the Web of Science (WOS) database since 1989

Source: Web of Science (WOS) database and authors own compilation

combination. Quite notably, the total number of documents available in the WOS (all time) under *healthcare AND marketing AND strategy* is much lower than the other two keyword combinations. The total number of documents under *healthcare AND marketing AND strategy* was 2,040 (Table 1) i.e. 2.5% of the documents published under each of the three categories. Further, the period between 2018 and 2022 accounts for 43.38% of all the documents available in WOS under *healthcare AND marketing AND strategy*. Given the context of our study, we restrict our analysis to the publications under the keyword *healthcare AND marketing AND strategy*. For simplicity, from here onwards, we address *healthcare AND marketing AND strategy* as HMS and the corresponding dataset as HMS dataset.

4.2 Citation report of the healthcare marketing strategy dataset

Hirsch’s index, or h-index, is a single-number criterion that helps quantify a single researcher’s scientific contribution. H-index is a relatively new metric that incorporates both the quantity and visibility of publications. An h-index of ‘x’ indicates an ‘x’ number of documents with at least ‘x’ citations (Bornmann and Daniel, 2007). This metric is extremely useful because it discounts the disproportionate weight of highly cited documents to those that have not received citations. WOS calculates the h-index based on the list of publications ranked in descending order by the times cited. For the HMS dataset, the WOS reported an h-index of 29, i.e. the dataset contains at least 29 documents that had received 29 citations each. In addition to the h-index, WOS reports another useful metric known as the average citations per article, i.e. “the sum of the times cited count divided by the number of articles in the dataset”. The average citations per article can be leveraged to assess the average impact of an article. The average citations per article for the HMS dataset was 5.45, i.e. an average of 5.45 citations per document. Table 2 summarises the main research theme of the top 25 highly cited publications in HMS between 2018 and 2022.

Research theme	References
Generic data modelling strategy for marketing managers in healthcare organizations, the categorization and validation of which may help these organizations in creating a competitive advantage	Oztekin (2018)
Systematic analysis of literature to identify the dominant logic about the marketing of healthcare systems in the context of Russia and Romania	Bulatnikov and Constantin (2021)
Forms in which scientific publications' intellectual structure and research trends come together in business-to-business (B2B) marketing strategies in the healthcare sector	Ferreira <i>et al.</i> (2022)
Strategic impact of the marketing communications mixes of Willis-Knighton Health System (Los Angeles, USA)	Elrod and Fortenberry (2018a)
Standard marketing process that can be deployed in the healthcare industry by employing any Customer Relationship Management (CRM) system, including a marketing solution (segmentation and campaign management)	Marcu and Popescu (2020)
The 4S (size, shape, share and soar) marketing model as a robust framework in strategic decision-making in healthcare organizations	Jena (2020)
The role of emerging technologies in the context of value-centred marketing (VCM) in health care	Agarwal <i>et al.</i> (2020)
Marketing success factors and how they evolve during different business phases in the context of Clemenceau Medical Center (CMC), a private healthcare company based out of Lebanon	Arzubiaga <i>et al.</i> (2022)
Branding strategies of medical services in the form of a comprehensive process model by considering the opinions of experts and managers of the Iranian health system	Khosravizadeh <i>et al.</i> (2021)
Catalysing factors behind marketing innovation and competitive advantage created by Willis-Knighton Health System (Los Angeles, USA)	Elrod and Fortenberry (2018b)
Brokerage analysis in commercial healthcare facilitation in London and Delhi to comprehend the strategies and strains for commercial mediation of access to health care	Hunter (2020)
Multilevel trust in international marketing strategy for healthcare services delivery	Fregidou-Malama and Hyder (2021)
Review literature on personalized medicine and pharmaceutical markets to understand how complex negotiations about the value of a pharmaceutical can comprise a market in myriad ways while also shaping the concerned patient populations	Wadmann and Hauge (2021)
Review the impact of pharmaceutical price regulation on access to essential medicines, drug innovation and launching	Mensa Sorato <i>et al.</i> (2020)
How do cultural dissonance, under-representation, stereotyping and stereotype threat interact to control the content and the effects of health promotion strategies targeted at newly emerging markets?	Gans (2021)

(continued)

Table 2.
Primary research themes of the top 25 highly cited publications* in healthcare marketing strategy between 2018 and 2022

Table 2.

Research theme	References
An empirical study to investigate the relation between digital marketing strategies and international patients' satisfaction in the context of the Jordanian Health Service Industry	Al-Weshah <i>et al.</i> (2021)
Recognize and prioritize impediments to the implementation of medical equipment (ME) marketing strategies using the analytic hierarchy process (AHP)	Gazerani <i>et al.</i> (2019)
The role of IoT and ML in designing an effective e-marketing strategy	Mondal <i>et al.</i> (2022)
Evolving hospital market in China post-the national health care reform in 2009	Jiang and Pan (2020)
Review the conceptualized marketing activity in the community pharmacy sector and demarcate the evidence for the effect of marketing activity	Mirzaei <i>et al.</i> (2018)
Theoretical framework for a two-sided market structure to model the competition between a preferred provider organization (PPO) and a health maintenance organization (HMO)	Lee and Lee (2020)
Multiple case-based analysis to research the marketing strategies used by owners of small businesses to develop and maintain their organization through the initial five years of business operation	Daugherty (2021)
Marketing approach implementation in social innovations and identify specific areas of marketing which can contribute to more efficient applicability of social innovations in the health sphere	Hanulakova <i>et al.</i> (2021)
The role of value chain flexibility (VCF) in the strategies of green service production (GSP) in health care	Kumar (2020)
Exploratory case study to understand how artificial intelligence enable and enhance value co-creation in the healthcare ecosystem	Leone <i>et al.</i> (2021)

Notes: Only documents with valid digital object identifier (DOI) are considered for analysis; *Documents sorted and ranked in descending order using the "Times Cited" (WOS score) metric
Source: Web of Science (WOS) database and authors own compilation

4.3 Descriptive statistics of the healthcare marketing strategy dataset

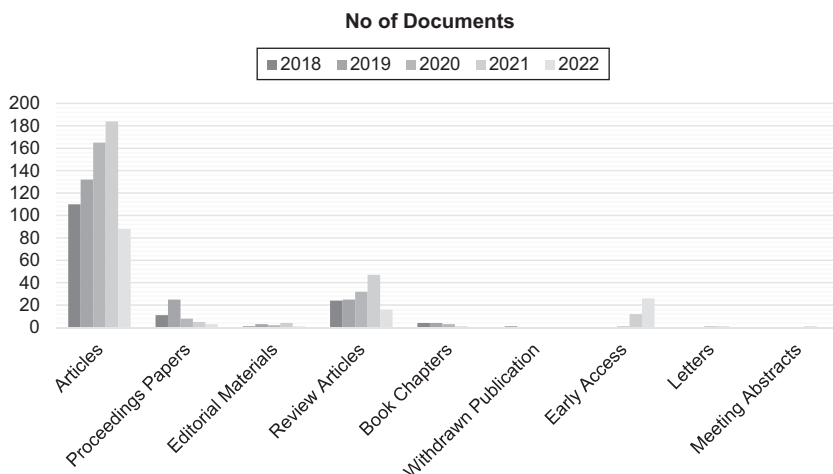
4.3.1 Document type-wise. WOS categorizes every publication indexed in the database based on the document type. These document types include articles, proceeding papers, editorial materials, book chapters, meeting abstracts and letters. Figure 2 below illustrates the distribution trend of the HMS dataset based on WOS-categorized document types. Most of the publications in HMS between 2018 and 2022 have been in the form of articles, followed by review articles and proceeding papers.

4.3.2 Research theme-wise. Figure 3 below presents the ranked distribution of the HMS dataset based on the top 15 research themes. We use colour codes to represent the breakthrough of new themes in the top-15 ranking for a particular year. For instance, computer science theory methods, hospitality leisure sport tourism and education educational research appeared in the top 15 in 2019 compared to the previous year. Similarly, immunology, biotechnology, applied microbiology, infectious diseases and medicine research experimental made it into the top 15 in 2020 compared to 2019.

4.3.3 Journal-wise. Figure 4 below shows the top 15 journals publishing in HMS between 2018 and 2022 and the distribution of the HMS dataset across them. The most popular journals which considered research in this area for publication include the *International Journal of Pharmaceutical and Healthcare Marketing* (45), *BMC Health Services Research* (18), the *International Journal of Environmental Research and Public Health* (14) and the *International Journal of Healthcare Management* (13).

4.3.4 Affiliation-wise. Figure 5 below illustrates the top 15 organizations that published their research in HMS between 2018 and 2022. The organizations with the highest number of contributions in this area include Harvard University (26), the University of London (24), the University of California System (22) and the US Department of Veteran Affairs (16).

4.3.5 Funding agency-wise. Figure 6 below exhibits the distribution of the HMS dataset based on the top-15 funding agencies across the globe. Some of the most active institutions that funded research in this area include the United States Department of Health and Human Services (43 publications), the National Institutes of Health (NIH USA) (29 publications), the



Source: Web of Science (WOS) database and authors own compilation

Figure 2.
Distribution of HMS
dataset based on
categorized document
types in the Web of
Science (WOS)
database for the
period between 2018
and 2022

2018	2019	2020	2021	2022
Health Policy Services	Health Policy Services	Health Policy Services	Health Policy Services	Health Policy Services
Health Care Sciences Services	Health Care Sciences Services	Public Environmental Occupational Health	Public Environmental Occupational Health	Business
Pharmacology Pharmacy	Pharmacology Pharmacy	Health Care Sciences Services	Health Care Sciences Services	Health Care Sciences Services
Business	Public Environmental Occupational Health	Business	Pharmacology Pharmacy	Public Environmental Occupational Health
Management	Business	Management	Business	Medicine General Internal
Medicine General Internal	Medicine General Internal	Pharmacology Pharmacy	Management	Management
Public Environmental Occupational Health	Management	Economics	Medicine General Internal	Pharmacology Pharmacy
Nursing	Computer Science Theory Methods	Medicine General Internal	Environmental Sciences	Materials Science Multidisciplinary
Computer Science Information Systems	Hospitality Leisure Sport Tourism	Immunology	Economics	Environmental Sciences
Medicine Research Experimental	Environmental Sciences	Biotechnology Applied Microbiology	Medical Informatics	Environmental Studies
Multidisciplinary Sciences	Medical Informatics	Computer Science Information Systems	Medicine Research Experimental	Business Finance
Operations Research Management Science	Computer Science Information Systems	Environmental Sciences	Multidisciplinary Sciences	Economics
Economics	Computer Science Interdisciplinary Applications	Infectious Diseases	Chemistry Multidisciplinary	Infectious Diseases
Engineering Industrial	Education Educational Research	Medical Informatics	Computer Science Information Systems	Nanoscience Nanotechnology
Environmental Sciences	Engineering Biomedical	Medicine Research Experimental	Engineering Biomedical	Physics Applied

Figure 3. Distribution of healthcare marketing strategy (HMS) dataset ranked in descending order by top 15 research themes[#]

Note: Colour codes have been used to denote the emergence of new themes for the corresponding year
Source: Web of Science (WOS) database and author’s compilation



Web of Science
(WOS) data set

Figure 4.
Top-15 journals
publishing healthcare
marketing strategy
papers between 2018
and 2022

Source: Web of Science (WOS) database and author's compilation

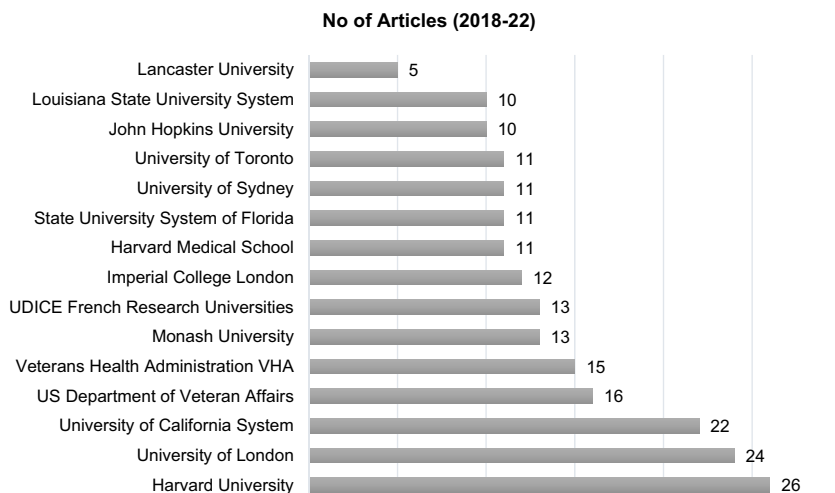


Figure 5.
Top-15 organizations
researching
healthcare marketing
strategy between
2018 and 2022

Source: Web of Science (WOS) database and authors own compilation

European Commission (28 publications), the Agency for Healthcare Research Quality (18 publications) and UK Research Innovation (16 publications).

4.3.6 *Nation-wise.* Figure 7 below shows the top countries that published on HMS between 2018 and 2022. As can be noticed, the highest number of documents came from the

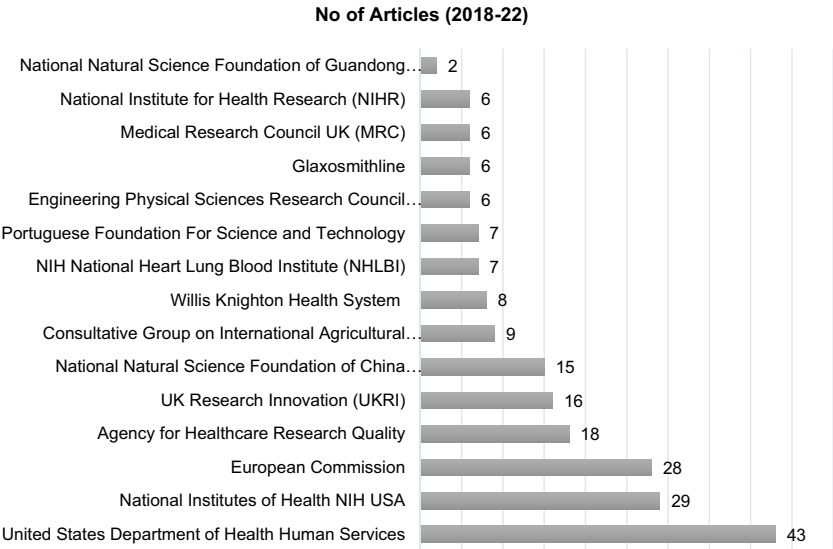


Figure 6.
Top-15 agencies
funding research in
healthcare marketing
strategy between
2018 and 2022

Source: Web of Science (WOS) database and authors own compilation

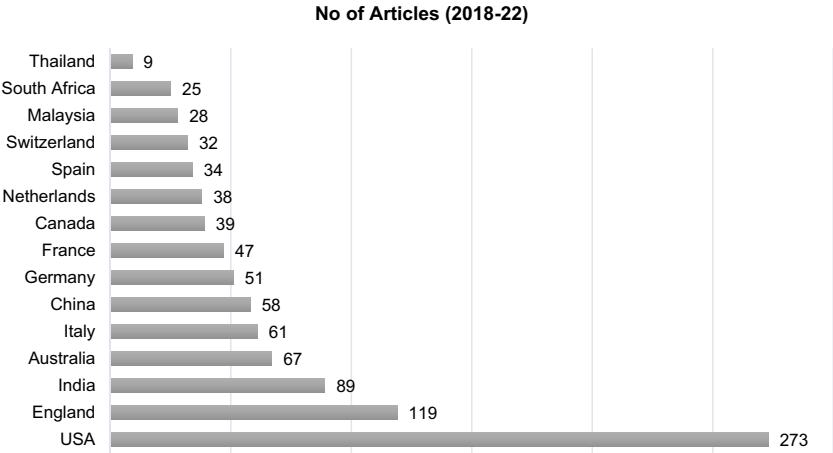


Figure 7.
Top-15 nations
publishing in
healthcare marketing
strategy between
2018 and 2022

Source: Web of Science (WOS) database and authors own compilation

USA (273 publications), followed by England (119 publications), India (89 publications) and Australia (67 publications).

4.3.7 Overall trend (pre- and post-COVID). Table 3 and Figure 8 show the comparative statistics of the HMS dataset between the pre-Covid and post-Covid periods based on the TD, number of authors, organizations and countries. We observe an upward trend across

all categories: TD (+71.47%), number of authors (+106%), number of organizations (+95.23%) and number of countries (+50.75%). Further, the number of authors/TD and the number of organizations/TD show a rise of +20.15% and +13.86%, respectively. However, we observe a significant drop (−12.09%) in the number of countries/TD over the same period.

4.4 Bibliometric analysis

4.4.1 Author co-citation analysis. We rely on a minimum citation threshold of 5, a minimum link strength of 10 and a minimum cluster size of 10 while performing the author co-citation analysis. Given that HMS is still an emerging area of research, we choose the threshold values accordingly to attain maximum coverage with the HMS dataset. We observe five different clusters (colour coded), as depicted in Figure 9 below. Each circle or node in a cluster represents an author, and the links between the nodes indicate the relationship between authors (i.e. by co-citations). The distance between two authors on the map shows the approximate relatedness of the two authors in terms of co-citations: the larger the author's name and the bigger the circle, the greater the node's weight. The weight of each

Web of Science
(WOS) data set

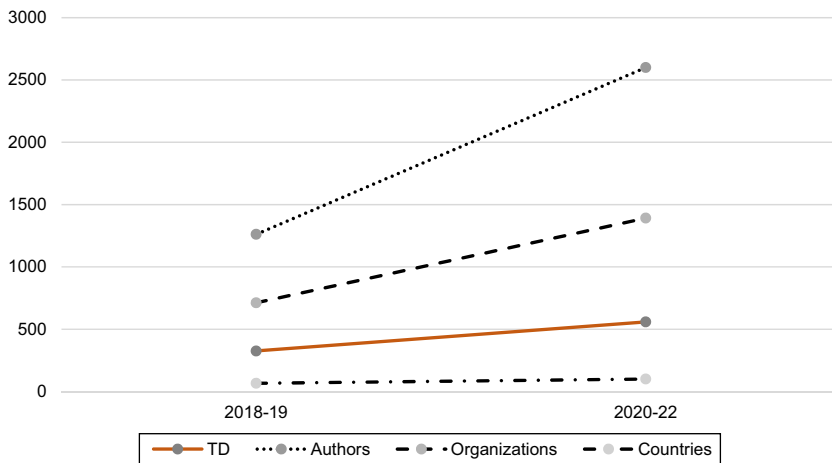
Period	TD	A	O	C	A/TD	O/TD	C/TD
Pre-Covid-19	326	1,262	713	67	3.87	2.19	0.21
Post-Covid-19	559	2,600	1,392	101	4.65	2.49	0.18

Notes: TD = total documents; A = number of authors, O = number of organizations; C = number of countries; pre-Covid-19 = 2018–2019; post-Covid-19 = 2020–2022 (cut-off) refers to the period. Cut-off date is 11th July 2022

Source: *Web of Science (WOS) database and author's compilation

Table 3.

General trends in the HMS dataset pre-and post-Covid-19, based on the total number of documents, number of authors, organizations and countries*



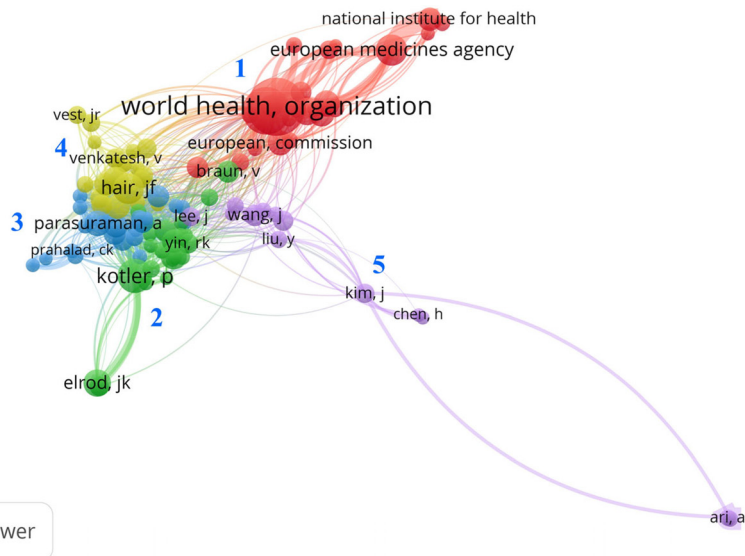
Source: Web of Science (WOS) database and authors own compilation

Figure 8. Plot showing trends in terms of total documents (TD), number of authors, organizations and countries between pre-Covid-19 (2018–2019) and post-Covid-19 (2020–2022) periods

4.4.2 *Bibliographic coupling.* Figure 10 below depicts the cluster map based on the bibliographic coupling of countries, and Figure 11 shows a network of coupling between institutions. We use a minimum threshold of three documents and 20 links to analyse the above two scenarios. The cluster map in Figure 10 shows that USA and England strongly influence research in HMS. Further, other major countries such as India, China, Australia, Germany, Italy, France, South Africa and Taiwan have strong coupling with USA and England. The cluster map shows some degree of heterogeneity, including other smaller nations such as Kenya, Ghana, Zimbabwe, Nigeria, UAE, Hungary, Mexico, Indonesia and Thailand, highlighting the research progress made by these countries in HMS.

Bibliographic coupling of institutions occurs when documents from two institutions reference documents from a third common institution. We observe six key institutions (see Figure 11) dominating the coupling and anchoring the clusters: Harvard Medical School (USA), Monash University (Australia), Lund University (Sweden), Imperial College London (England), University of Oxford (England) and Kaohsiung Medical University (Taiwan).

Figure 9. Author co-citation analysis (ACA) of the HMS dataset: minimum citation threshold of 5, minimum link strength of 10 and minimum cluster size of 10. Cluster 1: macroeconomic and demographic determinants of healthcare service delivery; cluster 2: strategies in healthcare marketing; cluster 3: socioeconomic in healthcare service delivery; cluster 4: data analytics and healthcare service delivery; cluster 5: healthcare product and process innovations



Source: VOSviewer (www.vosviewer.com/)

Web of Science (WOS) data set

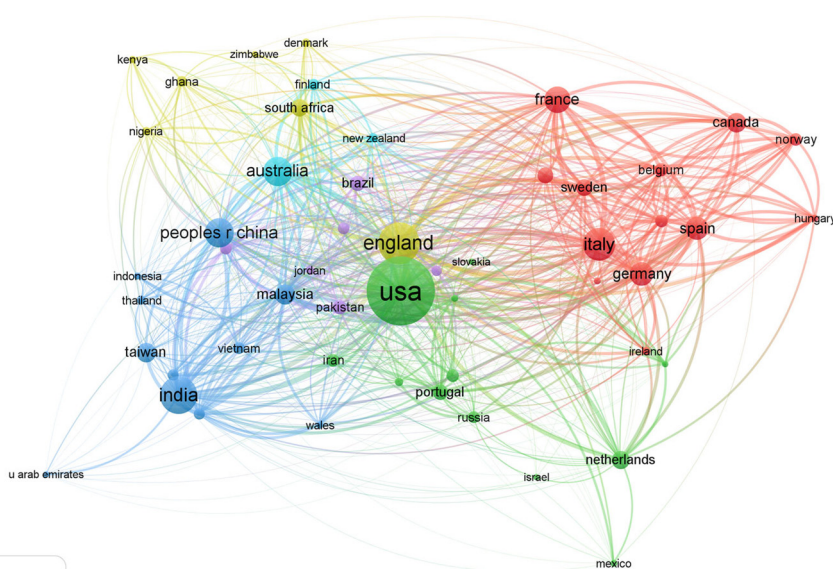


Figure 10.
Bibliographic
coupling of the HMS
dataset by country.
Minimum threshold
of three documents
and 20 links



Source: VOSviewer (www.vosviewer.com/)

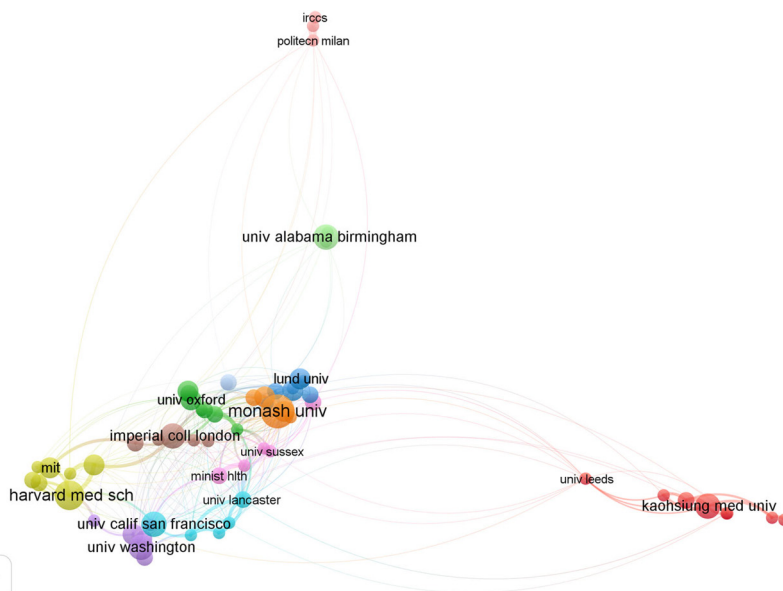


Figure 11.
Bibliographic
coupling of the HMS
dataset by institution.
Minimum threshold
of three documents
and 20 links



Source: VOSviewer (www.vosviewer.com/)

5. Discussion

The Covid-19 pandemic proved to be more community-driven than single-patient-driven, pushing the worldwide healthcare infrastructure on the brink of a complete breakdown. Additionally, the pandemic highlighted the importance of revisiting and re-evaluating the current health-care system and addressing the existing challenges. It became evident that an efficient healthcare service delivery system must place individuals at the core of all decisions (D'Ambrosio *et al.*, 2020), and hence, a one-size-fits-all strategy may not be optimal, especially in developing nations where impediments to health-care access and utilization exist. HMS in this context has an important role to play in establishing how and in what capacity basic healthcare services may be made accessible to the wider population. Therefore, a comprehensive understanding of the progress made in this domain is advantageous to numerous stakeholders. However, no study has provided a comprehensive overview of where most research on this topic has concentrated over the years. Moreover, despite the negative impact of the pandemic on people's livelihoods and general health, very limited information is available in extant literature regarding the evolution of HMS research before and after the pandemic. Our study addressed this gap by providing a comprehensive overview of the developments and trends in HMS research from 2018 to 2022. Our findings illustrate both the pre- and post-pandemic influences on research in this field.

Using descriptive and bibliometric analysis, we examined the development and trends of HMS research, and our findings are highly beneficial to the researcher(s) working in the HMS domain and to other interested study groups, policymakers and firms. Before and after the pandemic, our findings indicate an increase in the number of publications in WOS as well as the number of authors, organizations and countries. The pandemic provided a reality check regarding the acute need to enhance the current healthcare infrastructure by making it more robust to bear the burden of future catastrophes. This may have accounted for the increase as more stakeholders (authors, organizations and countries) continue to engage in HMS-based research. Nonetheless, overall, our findings indicate that HMS is still an emerging area of research and, hence, provides a lot of incentives for interested parties to explore this domain.

Nations across the globe are aware of the possibility of economic growth and development associated with research-based endeavours. Accordingly, an increase in research output is one of the primary indicators of progress for nearly every country (Dhamija and Bag, 2020; King, 2004). Recent accelerated growth in international collaborations and successful co-authorships raises the question of whether and to what extent governments gain from cooperative science. Wagner *et al.* (2018) posit that the global output of HMS-based research will be influenced by the extent to which nations participate in international co-authorships and researcher mobility. However, a dearth of financial support, particularly in low- and middle-income countries, impedes the efficient execution of research projects essential for identifying healthcare interventions and services through high-quality analysis. Unfortunately, insufficient access to research funds prevents the realisation of many exceptional concepts. It is possible to conduct research without external funding, particularly for small sample-size studies, which can result in significant contributions in case reports, case series, observational studies and small experimental studies. However, without access to external funding, research requiring multi-variable models, randomised controlled trials, experimental or observational analyses, and field experiments with a large sample size may not be feasible (Neema and Chandrashekar, 2021). Therefore, policymakers must choose their actions and strategies carefully to ensure that the necessary funding is available to core research clusters striving to develop better healthcare services, ultimately leading to greater health prosperity and development.

Our findings from the ACA reveal five clusters where HMS research concentrated between 2018 and 2022 (Figure 9). The cluster outlines global patterns and trends in research on HMS. Given various priorities and long-term goals, these patterns can take on different shapes and forms when analysed at the country level. This level of analysis is outside the scope of our investigation; however, future research may choose to investigate these associations. As discussed below, we observe strict heterogeneity among the five HMS clusters. Notably, the primary research themes of these individual clusters pertain to some of the most significant areas in which most nations must be willing to look in greater detail from a policy perspective.

5.1 Cluster 1 (red): macroeconomic and demographic determinants of health-care service delivery

This cluster is anchored by the World Health Organization. Several other national organizations are in this cluster, including the European Medical Agency, the National Institute of Health, the European Medicines Agency and the European Commission. This cluster's research examines the effect of macroeconomic (such as GDP and overall healthcare spending) and demographic factors on healthcare service delivery. This cluster's work is strategically significant in the context of both developed and developing nations. Much of the work in this cluster can be traced to the post-pandemic period, i.e. between 2020 and 2022. Some of the notable research studies emanating from this cluster include the study by [Jakovljevic et al. \(2020\)](#), who investigate the relationship between healthcare spending and real GDP growth in the G7 nations like Canada, France, Germany, Italy, Japan, the United Kingdom and the USA) and the EM7 nations like China, India, Brazil, Turkey, Russia, Mexico and Indonesia, the study by [Moorkens et al. \(2020\)](#) examining the impact of pricing strategies and national policy standards on the entry of biosimilars post-expiration of market exclusivity of branded drugs in European markets, the study by [Tong et al. \(2020\)](#) on understanding age-specific determinants of healthcare utilization and developing effective prevention strategies, and the research by [Verma et al. \(2020\)](#) that focus on identifying the relationship between the predictors of consumer satisfaction (such as quality of interaction, quality of hospital atmosphere, quality of object) and the demographic characteristics of patients in an e-healthcare setting.

5.2 Cluster 2 (green) – strategies in healthcare marketing

Author Elrod leads this cluster that concentrates on HMSs in healthcare service delivery. This cluster is significant because marketing is a critical component in the process of healthcare service delivery. Some notable works in this cluster include the critical role of marketing in health and medical organisations and the motivation to continue investing in creative marketing approaches to build a sustained competitive advantage ([Elrod and Fortenberry, 2018a, 2018d](#)), distinct marketing strategies in healthcare related to marketing communications and branding ([Elrod and Fortenberry, 2018b, 2018d](#)) and the impact of planned behaviour theory on brand equity and doctor's prescription behaviour ([Srivastava and Bodkhe, 2020](#)).

5.3 Cluster 3 (blue): socioeconomics in healthcare service delivery

This cluster investigates the relationship between socioeconomic factors and healthcare service delivery. Some of the seminal studies in this cluster include the study by [Agarwal et al. \(2018b\)](#) on the market driving through societal change at the Bottom of the Pyramid (BoP) and its implications for creating more inclusive healthcare markets, the study by [Agarwal et al. \(2018a\)](#) on the perception of emerging market innovation terminologies and

its socioeconomic impacts in the context of Indian healthcare innovations and the study by Philbin *et al.* (2018) on the perception of emerging market innovation. Notably, the research by Hollebeek *et al.* (2021) on socioeconomics and customer brand engagement (with essential/non-essential service) has some overlap with cluster 2's central research theme.

5.4 Cluster 4 (yellow): data analytics and healthcare service delivery

This cluster investigates the placement of data and analytics in the healthcare service value chain. As depicted in Figure 9, this cluster is connected to all other clusters, which explains the centrality of data analytics in current and prospective research on HMS. This cluster has produced notable work such as the study on health information exchange and market share, payer mix, and operating margins for strategic deployment in healthcare (Vest *et al.*, 2022), the correlation between a hospital's intra-system and inter-system information exchange (Vest and Simon, 2018), and the role of artificial intelligence in the formulation of innovative products such as cardiovascular RNA markers (Badimon *et al.*, 2021).

5.5 Cluster 5 (purple) – healthcare product and process innovations

Cluster 5 focuses on healthcare product and process innovation research. The cluster is led by the author Wang, who works on silicon-based optofluidic biosensors (Wang *et al.*, 2020). Notable works in this cluster include the study by Hall *et al.* (2020) on novel dosing strategies in cancer and their associated cost-benefits, as well as the study by Liu and Tamura (2020) on the future of smart home connectivity as a method of healthcare management for the geriatric. Author Ari, whose research belongs to this cluster and is located at a distance from other clusters on the map of clusters, focuses on aerosol-based drug delivery in minors (Ari, 2021).

6. Conclusion

The healthcare industry is dynamic; therefore, HMS remains a developing and evolving field. Changing external factors, such as pandemics, may necessitate revisions to the HMS. Covid-19 was a pandemic that significantly impacted the reordering of priorities. Our study is unique in synthesising and summarising the research progress made in HMS over the past five years. Before and after Covid-19, our findings illustrate the dynamics of the evolution of the HMS. Researchers and policymakers may view clusters more objectively and strategically due to our study's findings. This study will stimulate further investigation into the effects of pandemics on HMSs, tactics, and outcomes. This can accomplish the goals of expanding the marketing literature and generating clever insights for a broad audience. An essential consideration for these stakeholders is that each cluster must be analysed in its own right as its future scope.

6.1 Study implications

Our study has broad implications for future research, practice, and society. It allows researchers to identify market trends, comprehend patient behaviour, and prioritise research areas. It contributes to patient engagement and empowerment by educating marketers on the most effective marketing strategies, which increase patient engagement and promote healthy behaviour. In addition, through proper branding and reputation management, this paper teaches marketers how the correct HMS fosters patient trust and long-term relationships. At the societal level, the paper demonstrates how effective HMSs disseminate accurate and pertinent health information that enables individuals to make informed decisions about their health, resulting in enhanced well-being.

Our study has economic implications by stimulating growth by attracting patients, facilitating the development and adoption of innovative healthcare solutions, and supporting medical tourism. Our research bridges the gap between theory and practice by providing evidence-based insights and recommendations that can be implemented in actual healthcare settings. Insights such as the effect of macroeconomic and demographic factors on healthcare service delivery, the relationship between socio-economic factors and healthcare services, and the crucial role of data analytics in healthcare management are a few examples.

6.2 Study limitations

Our research has three significant limitations. First, documents from other databases, such as Scopus and PubMed, may provide additional insights. Future studies may analyse Scopus or PubMed documents to circumvent this limitation. Second, given our scope, we conducted our analysis at a very high level to ensure maximum coverage. Marketing is an extremely general keyword. Sales, advertising, segmentation, branding, equity, trust and targeting are some of the key aspects of marketing that may be overlooked if marketing alone is the keyword. Third, the author's keywords and title should be extremely specific and generate extremely specific papers. However, WOS and, for that reason, all other databases use computer-generated algorithms to generate keywords that might not provide optimal coverage. This can result in the use of keyword marketing in the abstract of a paper, even though the paper has nothing to do with marketing. Despite these limitations, the sample size of the HMS documents used in our study is large enough to provide valuable insights that can serve as a foundation for future research examining individual marketing components, as mentioned previously.

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