

Mapping the research on healthcare students' empathy: Insights from a bibliometric analysis

Hening Pratiwi¹, Susi Ari Kristina², Anna Wahyuni Widayanti², Yayi Suryo Prabandari³

¹ Department of Pharmacy, Faculty of Health Sciences, Universitas Jenderal Soedirman, Kampus Karangwangkal, 53122, Purwokerto, Indonesia

² Department of Pharmaceutics, Faculty of Pharmacy, Universitas Gadjah Mada, Sekip Utara, 55281, Yogyakarta, Indonesia

³ Department of Health Behavior, Environment, and Social Medicine, Faculty of Medicine, Public Health, and Nursing, Universitas Gadjah Mada, 55281, Yogyakarta, Indonesia

Corresponding author: Susi Ari Kristina (susiari_k@ugm.ac.id)

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Abstract

Empathy is required not only by healthcare professionals but also by students as healthcare professionals' candidates. The research into the development of empathy in healthcare students is essential in the field of health education. This study aimed to investigate research trends in the topic of healthcare students' empathy using bibliometric analysis. We used the Scopus database on June 17, 2023, and "empathy" AND "students" AND "pharmacy" OR "medical" OR "dentist" OR "nurse" OR "nutritionist" are the search keywords. The remaining articles were examined using VOSviewer software. The results demonstrated a rapid increase in research on the topic of healthcare students' empathy between 2014 and 2023. The most prolific authors were Hojat, M., and Diaz-Narváez. The United States has the most publications and citations in this discipline. The keywords used in the current study were grouped into 7 clusters, and the term "human" is most frequently used. Our study contributes significantly to the developing literature on empathy for healthcare students.

Keywords

empathy, students, bibliometric, education, healthcare

Introduction

Empathy in the healthcare context is the process of comprehending patients' feelings, difficulties, and situations, communicating that comprehension to the patient, and acting on that comprehension (Lor et al. 2015; Pratiwi et al. 2022; Yu et al. 2022). It is an important part of the therapeutic relationship and is vital to patients' perceptions of high-quality healthcare (Barker et al. 2022). Empathy is required not only by healthcare professionals but also by students as healthcare professionals' candidates because they have limited experience with patients or disease-related difficulties (Pratiwi et al. 2022).

Education is primarily acknowledged as the best strategy for ensuring the long-term growth of a discipline. Education research is crucial since it can help to promote logical curriculum design, enhance evaluation processes, and modernize study areas for students (Huang et al. 2022). For healthcare students to comprehend the value of empathy and to develop empathy, it is also crucial to give them with learning and experience opportunities. The research into the development of empathy in healthcare students is very essential in the fields of health education and healthcare settings.

Bibliometrics is the quantitative and qualitative evaluation of research and scientific progress. This field has

gained popularity in recent years because of the demand to analyze research outcomes at the individual, institutional, and geographic levels (Ejaz et al. 2022). The researchers utilize bibliometric analysis for a variety of purposes, including to identify new trends in the performance of articles and journals, collaboration patterns, and research elements, as well as to investigate the intellectual framework of a specific area in the existing literature (Donthu et al. 2021).

There are early publications that conducted bibliometric analysis on empathy but did not further specifically into healthcare students' empathy (Sousa et al. 2022; Yi et al. 2022; Manjarres et al. 2023). It is important and required to conduct a study on the development and state of the healthcare student's capacity to empathize. This study aimed to investigate research trends and hubs in the topic of healthcare students' empathy from 2000 to 2023 using bibliometric analysis. A comprehensive bibliometric overview of the relevant research developments was presented in this study to achieve the research objective.

Materials and methods

This study used bibliometric analysis to investigate current trends in healthcare students' research on empathy. The most essential bibliometric analysis includes content analysis and descriptive analysis. The descriptive analysis examines several publications' indices to assess the efficiency of authors' and sources' articles. In contrast, content analysis revealed the theoretical foundations of disciplines through keyword and citation analysis that identifies popular topics, thematic development, and research interests (Ejaz et al. 2022). According to Donthu et al. (2021), there are four processes for doing bibliometric analysis, along with the general guidelines, which include 1) defining the aims and scope of the bibliometric study, 2) Select the approaches for bibliometric analysis, 3) Gather the data for bibliometric analysis, 4) Execute a bibliometric analysis and report the results.

Step 1. Defining the aims and scope of the bibliometric study

This study aimed to investigate research trends and hubs in the topic of healthcare students' empathy from 2000 to 2023 using bibliometric analysis. We described how bibliometric analysis can be used to identify conceptual, intellectual, and social frameworks relevant to the topic of empathy in healthcare students. Then, we evaluated the most recent advances in research on healthcare student empathy and discussed its myriad applications in author selection. Its primary foundation is a statistical examination of published articles and the citations they have garnered (Rejeb et al. 2022). Researchers may examine the content of literature in their field of study, highlighting major themes and evaluating the development of a particular academic discipline.

Step 2. Select the approaches for bibliometric analysis

The second stage involves designing the bibliometric study and selecting procedures that align with the study's aims and scope (Donthu et al. 2021). We used the Scopus database on June 17, 2023, due to its extensive coverage and outstanding quality, which makes it the most preferred database for bibliometric analyses. "Empathy" AND "students," AND "pharmacy," OR "medical," OR "dentist," OR "nurse," OR "nutritionist" were the search keywords to use. The titles, abstracts, and keywords of research papers all contained these keywords. The following were the inclusion criteria: literature from the Scopus database, published from 2000 to 2023, in English only, original articles, reviews, conference papers, book chapters, and topics about healthcare students' empathy. We excluded all of those studies that included letters to the editor, comments, and irrelevant topics.

Step 3. Gather the data for bibliometric analysis

After checking the inclusion criteria. The data were then eliminated and rechecked to avoid data duplication and to guarantee that the data obtained highlighted empathy among healthcare students. The complete set of bibliographic data was downloaded in .csv format from the Scopus database. To ensure that the correct article was selected, abstract and/or article searches were performed. The remaining articles were examined using VOSviewer software (version 1.6.18) by a citation report after the non-English articles, letters to the editor, and irrelevant topics had been eliminated. The appropriate articles from the Scopus database were saved as ".CSV" files and imported into VOSviewer 1.6.18 for bibliometric analysis. This program assessed publication patterns, co-authorship, influential countries, organizations, networks of authors, networks of documents and co-citations, and networks of keyword co-occurrence (Yu et al. 2020; Arifah et al. 2023). VOSViewer could show and represent specific data on the Bibliometrics graphic map. A large bibliometric map makes it simple for academics to understand a relationship, and many prior studies have used this software for bibliometric analysis (Fan et al. 2020).

Step 4. Execute a bibliometric analysis and report the results

This study used two approaches for bibliometric analysis: performance analysis and science mapping. Performance analysis evaluates the contributions of research constituents, whereas science mapping focuses on their relationships (Rejeb et al. 2022). Performance analysis is a common practice in reviews, even in those that do not use science mapping. This is because it is similar to the background or participant profile that is typically presented in empirical research, but more analytically presented,

and it presents the performance of various research constituents (e.g., authors, institutions, and countries). In this study, we conducted a performance analysis that included publication time, author, countries, and institutions. Science mapping focuses on the connections between the components of research. The study focuses on the structural relationships and intellectual exchanges between the research's parts (Donthu et al. 2021). In this study, we conducted science mapping that included keywords' co-occurrence analysis and co-citation analysis.

Results and discussion

Our initial search found 1900 articles from Scopus. Fig. 1 demonstrates the process of selecting the procedure overall. Only 1796 articles were included for bibliometrics analysis after inappropriate articles were removed (non-English article 46, irrelevant topic 54, and letter to the editor 4) (see Fig. 1).

Performance analysis

Distribution of publication time

It is clear from the study conducted in 2020 that there is a growing interest in the topic of healthcare students' empathy, which suggests that this interest started developing around the turn of the millennium. Between 2014 and 2023, research on the topic of healthcare students' empathy expanded rapidly. In 2022, 164 papers were published. As of June 2023, 68 papers have been published (Fig. 2A). It is expected that this number will rise quickly. In general, it was indicated that the field's interest in further research was expanding.

According to the distribution of publications, there is an increasing interest in further research on healthcare students' empathy capacities. Based on the growing trend in the number of articles published over the past ten years, more articles may be published in 2023 and beyond. In addition, the publication trend is expanding and focusing more on the development of educational interventions that can enhance the empathy of healthcare students.

Distribution of author

Author analysis in a particular subject reveals researchers who have significantly advanced a field of study and describes patterns of collaboration and the idea of collaboration among researchers (Tan et al. 2021; Arifah et al. 2023). A total of 5755 authors conducted research on the topic of empathy in healthcare students. Hojat M and Diaz-Narváez, VP, were the most productive authors, with the most significant frequency peak for citations (Hojat M = 1347), followed by Calzadilla-Núñez A. The total link strength (TLS), which was obtained via VOSviewer, indicates the number of co-authorship linkages (Tan et al. 2021). In particular, the author concentrated on the empathy of medical, nursing, pharmacy, nutritionist, and dental students. Fig. 3B illustrates the co-authorship network for articles relating to healthcare student empathy. The number of coauthored publications is indicated by the size of each node, which represents an author. Collaborations are represented by links between the nodes, with more comprehensive links indicating deeper collaborations between authors. Different colors stand for various author collaborative interaction groups (Yang et al. 2022). Several clusters of authors who work closely together are seen in Fig. 3B, including Hojat M, Mangione S, Sullivan J, Cohen M, and Rosenthal S.

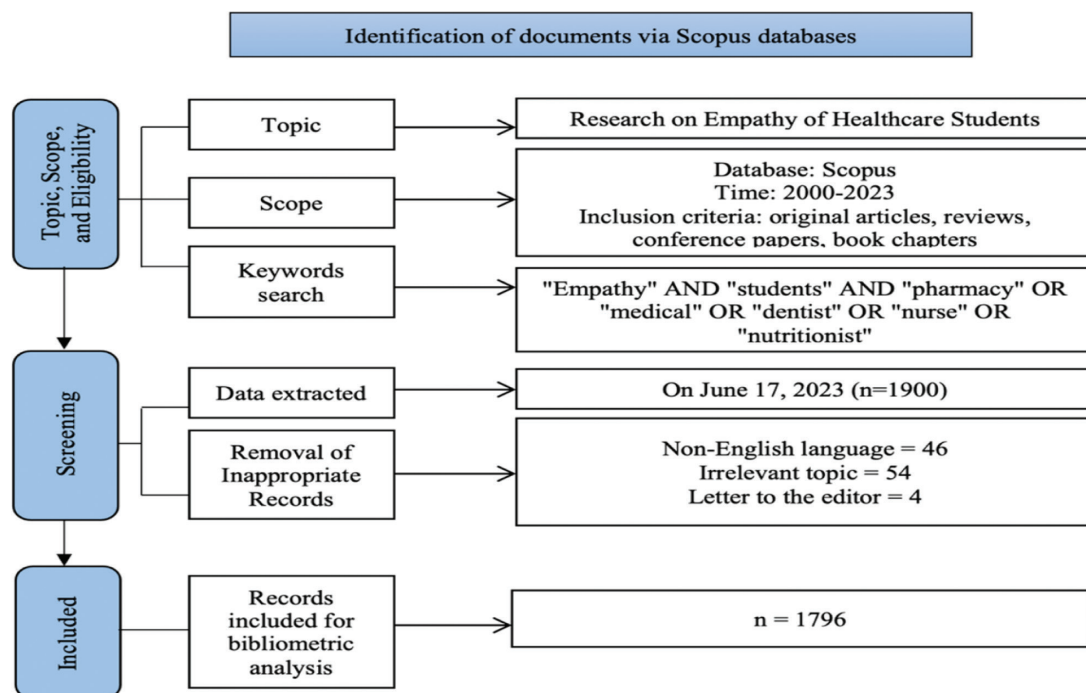


Figure 1. Flow chart of the search process.

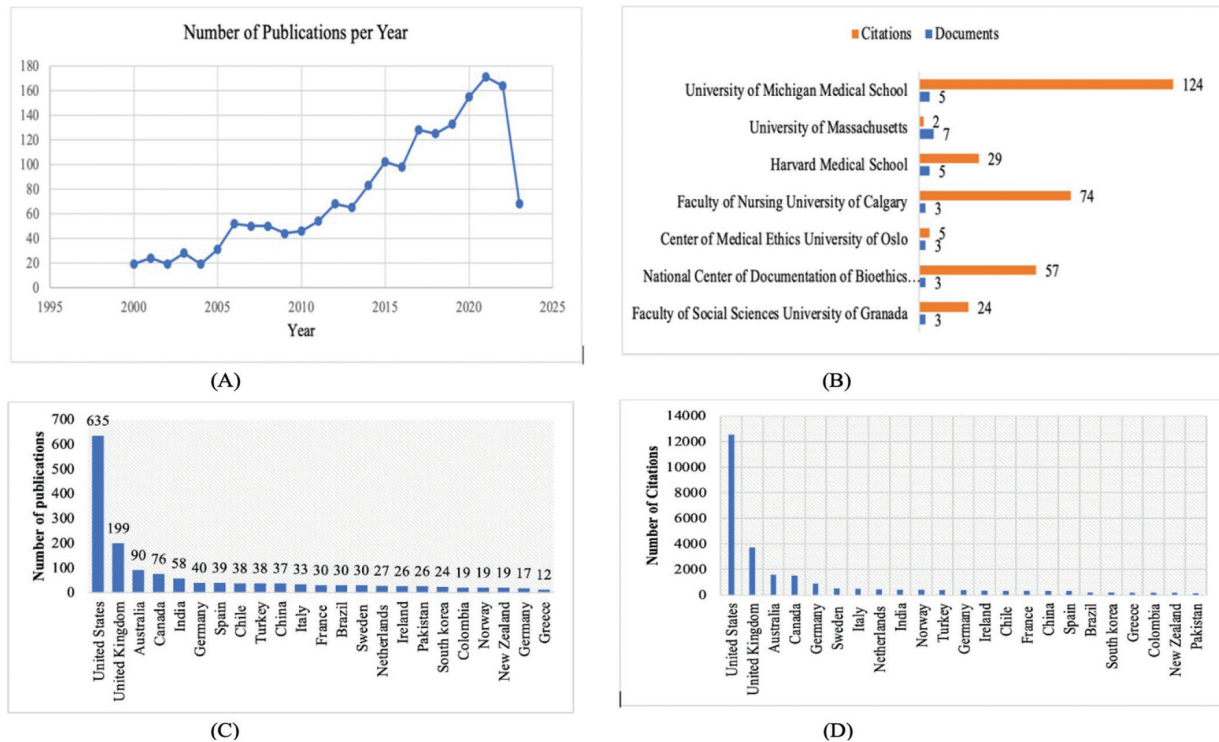


Figure 2. A. Number of Publications per Year; B. Distribution of Institutions; C. Number of Publications per Country; D. Number of Citations per Country.

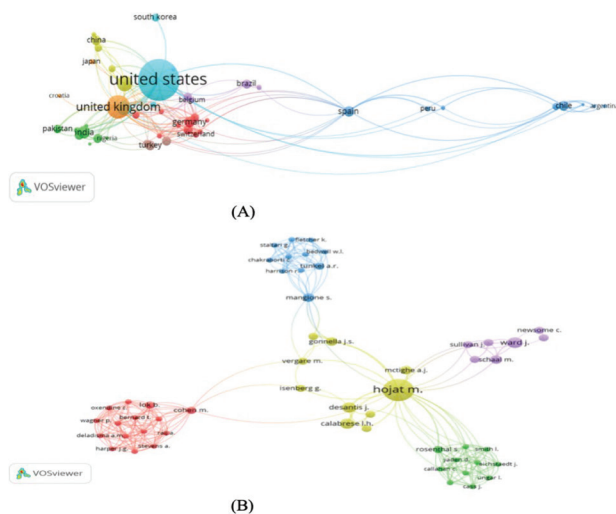


Figure 3. A. The country co-authorship network; B. Mapping publications of co-authors

Distribution of countries

An essential type of co-authorship analysis is country co-authorship analysis. It may be an indicator of the level of international communication as well as the dominant nations in this field (Liao et al. 2018). The countries with the highest number of articles can be found in Fig. 2C. The United States published 635 papers, the United Kingdom published 199 papers, while Australia, Canada, and India contributed 50–90. Furthermore, the United States also had the highest citation acquisition with 12,540 citations, followed by the United Kingdom with 3,715 citations and Australia with 1,563 citations (Fig. 2D). It seems that the leading countries developing empathetic

healthcare students research papers were industrialized economies country with large populations (Kruk et al. 2018). Additionally, these countries had significantly greater resources for their national healthcare systems and would prioritize the need for educational development to improve student empathy and skills.

The map has a variety of colors on the vosViewer visualization, which illustrates how the directions of research are varied. The large nodes remain in the dominant countries. The collaboration among institutions is represented by the links between nodes (Fig. 3A).

Distribution of institutions

The published papers were contributed by 4169 institutions, and 7 of those met the threshold for publishing more than three publications. The seven institutions are the Faculty of Social Sciences University of Granada, the National Center of Documentation of Bioethics Spain, the Center of Medical Ethics University of Oslo, the Faculty of Nursing University of Calgary, Harvard Medical School, the University of Massachusetts, and the University of Michigan Medical School (Fig. 2B). Three of the countries are located on the European continent. In contrast, four are located on the American continent.

The institutions that contribute the most to publications on the topic of empathy for healthcare students are the University of Massachusetts, The University of Michigan Medical School, and Harvard Medical School. The University of Michigan Medical School received the most citations previously, with the University of Calgary Faculty of Nursing and the National Center of Documentation of Bioethics Spain coming in second and third place, respectively.

Figure 4. A. Keywords co-occurrence network of the healthcare students' empathy; B. Density visualization of keywords co-occurrence.

The co-citation analysis

Co-citation analysis selects a small number of representative types of literature as the analysis object and employs network analysis to aggregate this literature into distinct groups. It is possible to learn the structure and characteristics of a particular domain in this manner. The significance of nodes in the reference co-citation network reveals research issues that are strongly related to the topic of healthcare students' empathy rather than revealing the high number of citations. In this study, of the 47683 cited references, 27 meet the threshold. The most co-cited document was Hojat et al. (2009) with the title "The Devil Is Third Year: A Longitudinal Study of Erosion of Empathy in Medical School."

Bibliometric analysis is a valuable and accurate approach for examining and interpreting vast amounts of scientific data. This method is aimed at comprehending the interconnection of journal citations and summing up the existing situation in terms of a current or emerging research topic (Donthu et al. 2021). In this study, we conducted a comprehensive bibliometric analysis to investigate research trends and hubs in the topic of healthcare students' empathy from 2000 to 2023.

A total of 1796 scientific articles were retrieved from the Scopus database, and the progression of research on healthcare students' empathy over the previous 13 years was analyzed. This study highlights the development context and trends in healthcare students' empathy research and serves as a fundamental reference and guide for future research on this topic. This study identified the most producing countries, institutions, and authors. In addition, it identified the most essential study topics pertaining to the empathy of healthcare students.

According to our findings, the rise in publications on healthcare students' empathy and related themes is increasing year by year, with the highest increase in the number of publications in 2022. It is expected that the number will rise further in 2023 and beyond. Several studies (research papers, systematic reviews, and meta-analyses) on the empathy of healthcare students have been conducted by researchers from all over the world. After 2014, the research on the empathy of healthcare students entered a period of accelerated expansion, with the annual number of articles exceeding 90 and the likelihood that this number will continue to increase considerably until the end of 2023. From 2000 to 2014, the number of publications grew slowly, remaining below 90.

Additionally, our analysis of national contributions found that the United States is the leader in this discipline in terms of both publications and citations. Following that, the United Kingdom, Canada, and even India became influential contributors. In terms of institutional contributions, the University of Michigan is in the lead. According to our investigation of institutional collaboration networks, the attention of this topic is gradually shifting from high-income countries to developing market countries and regions.

The analysis of keyword co-occurrence revealed seven clusters. The first cluster, consisting of 391 words, focuses on studies on medical student empathy and the development of strategies to enhance medical student empathy. The second cluster, which consists of 187 words, concentrates primarily on studies on nursing students' empathy and how to enhance their empathy through education. The 131 words represent cluster 3, which is primarily concerned with empathic research for clinical services and nutritionists. Additionally, Cluster Four focuses on enhancing pharmacy education to increase pharmacy students' empathy, Cluster Five concentrates more on dental education, Cluster Six focuses on empathy research related to psychology, and Cluster Seven concentrates on empathy research involving nonhumans or animals. This can serve as a representation of future research opportunities for developing more intriguing topics, particularly for health students in fields that lack extensive research development, such as pharmacy, dentistry, and others.

The term "human" is most frequently used (1555 times). Naturally, this has a connection with humans or the patient in the case of healthcare. Patients and healthcare professionals agree that compassionate and empathic care is of the most tremendous significance (Wenger et al. 2023). To achieve the best outcomes from therapy and encourage patient compliance, healthcare professionals need to build relationships with patients and express empathy (Williams 2010; Lown et al. 2011).

When evaluating trends over time, research on the empathy of healthcare students in the prior year only focused on measuring empathy and developing or validating empathy questionnaires. However, in more recent years, the impact of an educational intervention has started to be developed to enhance the empathy of healthcare students. In addition, this can serve as the foundation for strengthening the educational system and producing professionals who will treat patients and people around them with compassion and empathy. Higher levels of empathy among healthcare professionals not only promote better patient communication but also have positive effects on patient outcomes, such as enhanced patient self-care and greater patient satisfaction (Pratiwi et al. 2023).

In contrast to previous bibliometric articles in related fields, our study is a comprehensive bibliometric analysis that explicitly discusses the development of research on the empathy of healthcare students. There are early publications that conduct bibliometric analyses on empathy but did not further specifically into healthcare students' empathy (Sousa et al. 2022; Yi et al. 2022; Manjarres et al. 2023). Our study contributes significantly to the developing literature on empathy for healthcare students. The significant findings may provide a valuable framework for researchers, practitioners, and decision-makers in the related disciplines to progress educational institutions to improve empathy for healthcare students as healthcare candidates. Furthermore, the framework's assertions constitute an opportunity for future study that takes direction to foster empathy in healthcare students.

This study has several of limitations that must be considered before evaluating the findings. First, we limited our data collection to only the Scopus database. To find more papers, future research should search more databases. Second, the current study only made use of conventional bibliometric indicators. The study's findings may be more credible if a range of methodologies were used; as a result, more methods and indicators need to be taken into consideration in the future. Third, our study concentrated on bibliometric analysis of research on healthcare students' empathy. The study's content was not thoroughly discussed. This necessitates future literature reviews that are more organized.

Conclusion

In this study, we conducted a comprehensive bibliometric analysis to investigate research trends and hubs in the topic of healthcare students' empathy from 2000 to 2023. The number of publications on healthcare students' empathy and related topics is increasing annually, with the most

significant increase expected in 2022. It is expected that the number will rise further in 2023 and beyond. In this field, the United States is the leader in terms of both publications and citations. Following that, the United Kingdom, Canada, and even India became influential contributors. The analysis of keyword co-occurrence identified seven clusters. The keywords used in the current study were grouped into 7 clusters by VOSviewer, and the term "human" is most frequently used. Our study contributes significantly to the developing literature on empathy for healthcare students. The key findings may provide researchers, practitioners, and decision-makers in related disciplines with a valuable framework for advancing educational institutions to enhance healthcare students' empathy as healthcare candidates.

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