BIBLIOMETRIC ANALYSIS OF FACTORS AFFECTING PERFORMANCE AND COMPLETENESS OF ELECTRONIC MEDICAL RECORDS (EMR) IN PRIMARY HEALTH SERVICES

Gendis Ratri Kusuma Wardhani[1]*, Rosihan Adhani[2], Abdullah Oski Illiandri[3], Musafaah[4], Iwan Alfanie[5]

[1-5]Faculty of Medicine and Health Sciences, Lambung Mangkurat University

Email Korespondensi: gendisratri64@gmail.com

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ABSTRACT

Electronic Medical Records (EMR) completeness and accuracy are fundamental to effective patient care, clinical decision-making, and overall healthcare management. In recent years, there has been increasing attention to improving EMR documentation by healthcare professionals to improve data quality and patient care outcomes. This bibliometric study aimed to explore the trends, research focus, and gaps in the literature regarding EMR completeness from 2019 to 2024. The study used Publish or Perish software to collect data from Google Scholar with specific keywords such as Performance, Factors, Electronic Medical Record (EMR), EMR Completeness, Primary Healthcare, Filling, Documentation, and Medical Record Accuracy. The analysis included the 30 highest ranked journals. In addition, VOS Viewer was used for network visualization, overlay, and density to analyze thematic linkages and identify potential research gaps. Bibliometric analysis showed that Indonesia, the United States, and Ethiopia were the main contributors in EMR-related publications. Frequent themes such as data completeness, quality, and accuracy, emphasize their crucial role in the EMR research field. These findings emphasize the importance of continuously improving EMR data completeness and accuracy, which are critical for reliable clinical decision making and effective healthcare delivery. Future research should focus on developing methodologies to improve data quality and integration of EMR systems with other health information systems. In addition, exploration of policy and regulatory implications related to EMR completeness may provide valuable insights for healthcare practice.

Keywords: EMR Completeness, Data Quality, Bibliometric Analysis, Health Documentation, VOS Viewer.

INTRODUCTION

In the era of growing digitalization, digital transformation in the healthcare sector is a necessity. One important innovation in this field is the use of Electronic Medical Records (EMR). EMR plays a crucial role in efficiently storing, managing, and accessing patient data, which in turn can improve the quality of primary healthcare.

The use of Electronic Medical Records (EMR) in primary healthcare has become an urgent need as information technology develops in the healthcare field. An effective and complete RME is essential to support rapid and appropriate clinical decisions, reduce medical errors, and improve coordination between health care providers. The completion of a complete Medical Record is important for Health Service Agencies because it can affect the assessment of the quality or effectiveness of medical services provided

to patients. A Medical Record is said to be complete if all aspects of the data in the Medical Record have been filled in completely and accurately (Muhlizardy & Meisari, 2022).

EMR provides various benefits, such as the reduction of medical errors, improved coordination between healthcare providers, and ease in monitoring and evaluating patient health. However, EMR implementation is not free from challenges that affect its performance and comprehensiveness.

Factors such as technology infrastructure, adoption rate by healthcare workers, health policy, and digital competency of medical staff are some of the aspects that play an important role in the success of EMR implementation. There are various factors that influence EMR performance and completeness. Through bibliometric analysis, this study aims to identify and understand these factors based on existing scientific literature. The study also aims to evaluate research trends and identify research gaps that may exist in this area. This study aims to conduct a bibliometric analysis of the factors affecting EMR performance and completeness in primary healthcare. Bibliometric analysis is a method used to identify research trends, collaboration between researchers, and evaluate the impact of research based on bibliographic data. Through this approach, this study will compile a map of the scientific literature related to this topic, identify key themes, and uncover remaining research gaps.

By understanding the factors that influence EMR performance and completeness, it is expected to provide deeper insights for policy makers, health practitioners, and researchers in optimizing the use of EMRs in primary health care. This study is also expected to contribute to the development of more effective strategies and policies in EMR implementation in the future.

LITERATURE REVIEW

The use of technology in hospital services has been shown to improve the efficiency and performance of medical services, as it enables faster processes compared to traditional manual systems (Lestari et al., 2020). In order to ensure the quality of health services, every individual who undergoes a health examination is required to have a medical record that is recorded in a complete, clear, accurate and timely manner. This recording must be carried out in an integrated manner by health workers in accordance with the Minister of Health Regulation No. 24 of 2022 concerning Electronic Medical Records (RME).

Comprehensive and integrated medical records provide important data that is not only useful for monitoring individual patient care, but also for clinical audit purposes. This information is invaluable in assessing the pattern of care provided, enabling a more in-depth evaluation of the effectiveness and efficiency of healthcare services provided by hospitals (Garba & Harande, 2016). Data collected through medical records can be used to identify trends and community health needs, assisting in better evidence-based decision-making by hospital management.

In addition, well-filled medical records assist in the preparation of accurate and complete health reports, which are the basis for future healthcare planning and development. The implementation of electronic medical records (RME) supports these efforts by providing a digital platform that facilitates easy access and analysis of health data. This not only improves the hospital's operational efficiency, but also enhances patient satisfaction through more responsive and high-quality services.

Overall, the integration of technology in the recording of medical records and the utilization of data generated from medical records is an important step towards improving a more modern and efficient health system. The implementation of this technology

requires commitment from all relevant parties to ensure that all aspects of medical records are managed properly, so that the main goal of improving the quality of health services can be achieved.

Complete and accurate medical record filling is a crucial aspect for health care institutions. This is very important because it can affect the assessment of the quality and effectiveness of medical services provided to patients. According to Muhlizardy and Meisari (2022), medical records are considered complete if all the required data has been filled in correctly and in detail. The responsibility for filling out this medical record lies with the doctor who provides the service and all medical personnel involved in patient care. If the filling of medical records is not done completely, for example not including the exact diagnosis of the disease or not including the name and signature of the doctor in charge, it will be difficult to account for misdiagnosis from a legal point of view if problems occur in the future (Lisnawaty & Andisiri, 2018).

Other factors affecting the completeness of medical records include the lack of motivation of medical staff in filling out documents, the absence of sanctions for health workers who do not fill out documents completely, and ineffective monitoring and evaluation. In addition, the lack of socialization regarding Standard Operating Procedures (SOP) for filling out medical records, the structure of medical record forms that are less systematic or not well integrated, and limited financial resources to support the evaluation of medical record completeness are also significant contributing factors (Mukarom & Septiawan, 2022). All of these factors show how important it is to fill out complete medical records to ensure data accuracy and improve the quality of health services.

Often, the problems that arise in filling out medical records are related to the lack of completeness, diagnoses written by doctors that are not specific enough, unclear identification of the examining doctor, and writing that affects readability. This situation can have an impact on both internal and external hospitals, as the results of data processing are used as the basis for creating reports related to various hospital planning and decision-making by management. In particular, the evaluation of services that have been provided is expected to be improved based on the results of the evaluation (Wirajaya, 2019).

The implementation of medical records can improve the achievement of quality objectives in the field of medical records, reduce delays in medical record files and shorten the service process so that it is time and labor efficient (Saputro, 2020). The use of RME is expected to produce complete medical record records to support the needs of service activities and service management and be able to produce information and reports according to needs (Sudra, 2021). The implementation of RME has an impact not only on providing benefits to patients for documenting patient data, but also provides benefits for health workers and health service providers (Ilmi, 2016).

Inaccurate data will affect the quality of information in the Medical Record. The accuracy of filling in Electronic Medical Record data is very necessary because this information is a source of data that can be used as legal evidence (Silva & Dewi, 2023). Incomplete filling of Electronic Medical Records greatly affects patient safety because this data can be used to confirm diagnoses and make decisions on medical actions to be taken. In addition, incomplete filling of Electronic Medical Records can hamper the administrative process and cause rejection of BPJS claims (Karmila, 2020).

Another possibility is that officers will find it difficult to assess the services provided. This results in Medical Record documents that cannot be used as legal evidence in court if needed (Lestari et al., 2021). As stated (Alif, 2019) if there is a problem with both the doctor and the health agency, proof of Medical Record recording can be used as a legal means of accountability. Besides, Medical Records

play an important role as one of the standards that must be met in an accreditation assessment (Simbolon, 2015).

In implementing the RME system, evaluation is needed for a process that provides information about the progress of an activity that has been carried out, as well as how to distinguish achievements from certain standards in order to determine whether or not there is a difference between the quality of the system and system users, and the form of benefits that are completed when compared to the desired expectations (Kinanti et al., 2021).

Evaluation needs to be done to determine the success rate of electronic medical record implementation. Factors that can be used as variables to measure the successful implementation of an information system according to Delone & McLean's theory are system quality, information quality, service quality, user satisfaction, individual impact and organizational impact (Purwandani, 2018). System quality, information quality, and service quality have a significant effect on system user satisfaction. The better the perception of system quality, information quality, and service quality, the more user satisfaction will increase (Pawirosumarto, 2016).

Information system evaluation can be done with several analysis models, one of which is PIECES. According to Flora et al. (2022) that the use of e-puskesmas using the PIECES method, from the performance aspect makes it easier for health workers to work, the information aspect in the process of entering data into the system is still complicated, but from the economic aspect there are computer limitations because the system is only used in the service sector, the control aspect often experiences errors and is not free from viruses, while the efficiency aspect has not provided the efficiency of health workers but from the service aspect the system is easy to access and use.

Research conducted by Leonard et al. (2018) system deficiencies were found in the aspect of information that did not meet the needs, the economic aspect did not provide benefits, the unrestricted control aspect, the efficiency aspect of the burden on health workers twice the work, and the service aspect that needed system development to be easy to use.

Therefore, an evaluation needs to be carried out to assess the performance of the system whether it is running as expected, so the PIECES method is used to assess the performance of the current system. The PIECES framework has aspects of performance, information, economics, control, efficiency, and service. The use of the PIECES framework as a system analysis is carried out to determine the advantages and disadvantages of the system (Kinanti et al., 2021). This analysis will help in knowing how the RME picture is running. The utilization of RME at the puskesmas has not been fully carried out and so far no evaluation has been carried out, so researchers are interested in knowing the advantages and disadvantages in the RME system.

Completeness of medical records of hospitalized patients is influenced by various complex and interrelated factors. Research conducted by Ulfa revealed several main causes of incomplete medical records. One of the main factors is the limited time health workers have to fill out medical records thoroughly. Many health workers are under time pressure due to high workloads, so filling out medical records is often not a top priority. In addition, the absence of sanctions or consequences for health workers who do not complete medical records also contributes to this problem. Lack of socialization and understanding of the Standard Operating Procedures (SPO) for filling out medical records is also an important cause. Health workers often do not receive adequate training on the importance of the completeness of medical records and how to fill them in correctly. The lack of discipline among nurses and doctors in filling out medical records completely and on time adds to

the complexity of this problem (Siti Nadya, 2017).

On the other hand, research by Anggraini highlighted different aspects that influence the incompleteness of medical records. She found that the lack of adequate facilities and infrastructure is one of the main barriers. Many health facilities do not have the necessary tools or technology to support the efficient completion of medical records. In addition, the absence of clear and specific Standard Operating Procedures (SOPs) for medical record filling is also a significant factor. Unclear or non-existent SOPs cause uncertainty among health workers regarding the standards to be followed, potentially leading to incomplete medical records (Anggraini, 2017).

Overall, these studies show that to improve the completeness of inpatient medical records, a comprehensive approach is required. This includes increasing the time allocated for medical record completion, implementing sanctions for non-completion, better socialization and training on SPOs, and improving supporting facilities and infrastructure. Thus, the quality of medical documentation in hospitals can be significantly improved, which will ultimately contribute to improving the overall quality of health services.

RESEARCH METHODOLOGY

This research method is designed as a bibliometric study that aims to analyze the completeness of electronic medical record (EMR) filling and health by health workers. The study started with data collection using Publish or Perish software. We conducted a literature search with specific keywords including "*Performance", "Factors", "Electronic Medical Record (EMR)", "EMR Completeness", "Basic Health Services", "Filling", "Documentation",* and "*Medical Record Accuracy*" on Google Scholar. The publication year range that this study focused on was 2019-2024. We selected the 30 highest-ranked journals based on the number of citations to ensure that the analyzed research has significant relevance and impact in the field.

After the data was collected, the next step was to classify the articles found. This classification was done based on several important categories, namely year of publication, journal type, number of citations, and country of origin. This classification aims to provide a more structured picture of the distribution of existing research. This information also allows us to analyze temporal trends, dominant research types, as well as geographical influences within the field of study.

For further data analysis, we used VOSviewer software. The collected data was inputted into VOSviewer to produce informative visualizations. In this software, we set a minimum occurrence parameter of 3 and a minimum term of 18 to map the relationship between terms found in the literature. The visualizations generated by VOSviewer include three main forms: networking, overlay, and visual density. Each of these forms of visualization provides a different perspective in understanding the data. Networking visualizations were used to display the interrelationships between different terms and concepts that appear in the literature. This visualization helps identify the relationships between different studies as well as how related topics are evolving in the context of EMR. By looking at how the terms are connected, we can identify research networks that may influence and reinforce each other.

The overlay visualization provides a temporal overview of how certain topics emerge and evolve over time. In this way, we were able to identify recent research trends in the topic of EMR charging completeness. This visualization allowed us to see the shift in research focus from year to year and how certain issues gained greater attention in certain periods. Meanwhile, the density visualization shows the density of research around a particular topic. This visualization makes it easier to identify areas that have been extensively researched as well as find research gaps

that may not have been widely explored. By knowing the areas that are dense with research, we can avoid duplication and instead, focus on under-researched areas to make more meaningful contributions.

Based on the visualization results generated, we conducted data interpretation to identify relationships between concepts and find potential research gaps for further study. This interpretation not only provides a comprehensive overview of the research landscape related to EMR completion by healthcare workers, but also reveals the factors that influence completion. With a bibliometric approach integrated with visual analysis, this research is expected to identify relevant trends, linkages, and research gaps to be examined in more depth in future studies. This approach ensures that research in the field of EMR can continue to develop with a strong foundation and be supported by solid empirical evidence.

RESULTS RESSEARCH AND DISCUSSION

This study provides an in-depth analysis of publication trends related to the completeness of electronic medical record (EMR) filling and health by health workers. The analysis was conducted on journal articles published between 2019-2024 using Publish or Perish and VOSviewer software. The results of this analysis not only provide an overview of the temporal and geographical distribution of the research, but also reveal the journals with the highest number of citations, reflecting the influence and importance of the research in the scientific community. In this discussion, we will outline publication trends by year of publication, country of publication, and journals with the highest number of citations. Through this analysis, we hope to provide a comprehensive insight into the development and direction of research in the field of EMR.

Years	Total
2019	4
2020	6
2021	6
2022	9
2023	1
2024	4
	30

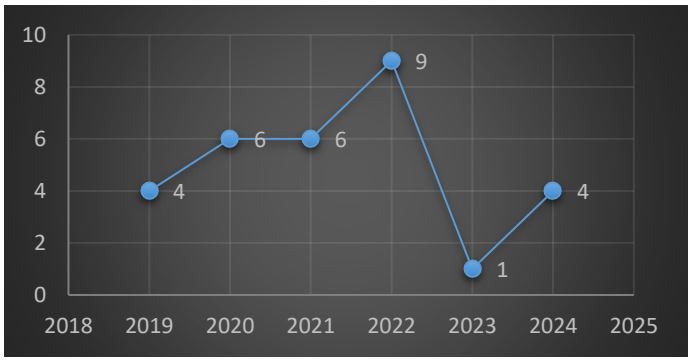

Figure 1. Related Publication Trends From Google Schollar Databases Using Pop Application

Publication Trends by Year

Based on publication trend data from 2019 to 2024, there were fluctuations in the number of articles published related to the completeness of filling in electronic medical and health records by health workers.

In 2019, the number of publications was recorded as 4 articles. This figure has increased in 2020 and 2021, with 6 articles each. This increase indicates a consistent interest from researchers in the topic for two consecutive years. The peak number of publications occurred in 2022 with a total of 9 articles, reflecting a significant peak of attention and research in this field. However, in 2023, there was a drastic drop with only 1 article published. This decline could be due to a variety of factors, including a possible shift in research focus or obstacles in the publication process. Entering 2024, the number of publications increased again to 4 articles, indicating a recovery in interest in this research. Overall, this trend reflects the dynamics and fluctuations in research attention to

the completeness of electronic medical record completion by health workers, with a peak of attention in 2022 and a sharp decline in 2023, before finally experiencing a recovery in 2024.

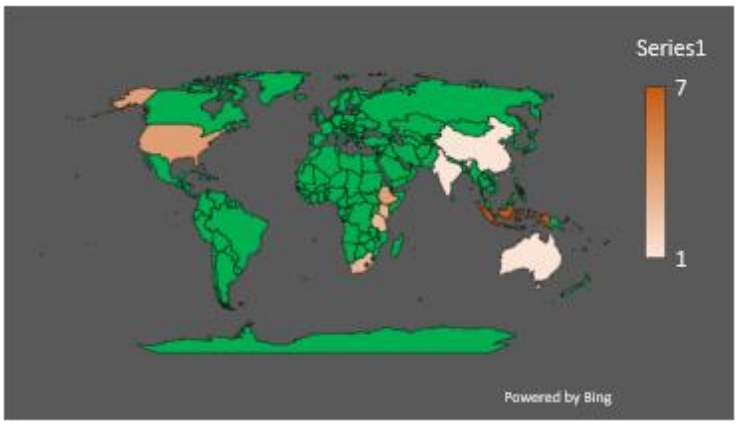

Figure 2. Distribution of countries that publish related research

Publications By Country Of Publication

Based on the available data, publication trends related to the completeness of filling in electronic medical and health records by health workers show significant variations based on the country of origin of the researchers. Indonesia topped the list with a total of 7 publications, showing the most contribution to the study. The high number of publications from Indonesia may reflect the country's significant efforts in developing and improving the electronic medical record system, as well as encouraging improved quality of medical documentation by health workers.

The United States (USA) and Ethiopia had 4 publications each, putting them in second place in terms of number of publications. The sizable contribution of the USA can be attributed to its more established health and information technology advancements, while Ethiopia showed significant developments in health research, reflecting efforts to improve the country's health system.

Other African countries, such as South Africa, Kenya and Tanzania, contributed 3 publications each. This indicates considerable interest in the region on the same topic. The publications from South Africa, Kenya, and Tanzania reflect the increased awareness and growing research in the region regarding the importance of electronic medical record completion to improve primary healthcare services. Rwanda had 2 publications, indicating active but lesser engagement compared to other African countries. Meanwhile, India, China, Australia and the West African region contributed 1 publication each. Although the contribution from these countries is relatively small, it shows that research on electronic medical record completion is also receiving attention in different parts of the world.

Overall, this distribution of publications reflects the wide and varied attention of different countries to the importance of electronic medical record completion. This research highlights that despite differences in the number of publications, countries around the world are working to improve the quality and effectiveness of their electronic medical record systems. This data illustrates the global contribution to understanding and improving the completeness of electronic medical record completion by healthcare workers, and shows the potential for international collaboration to share knowledge and best practices in this area.

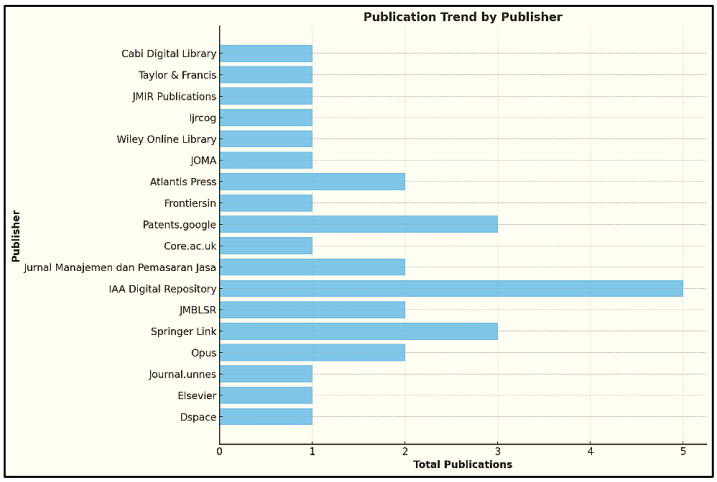

Figure 3. Distribution Of Publishers That Publish Related Research

Publication Based on publisher

Based on the available data, publication trends related to the completion of electronic medical and health records by health workers show significant variations based on journal publishers. The publisher that contributed the most publications was IAA Digital Repository with a total of 5 publications, showing dominance in disseminating research related to this topic.

Springer Link and patents.google contributed 3 publications each, demonstrating their important role in distributing relevant research. Some other publishers such as Opus, JMBLSR, Journal of Services Management and Marketing, and Atlantis Press contributed 2 publications each, which also shows their significant contribution in this field.

In contrast, some publishers contributed only one publication, including Dspace, Elsevier, journal.unnes, core.ac.uk, frontiersin, JOMA, Wiley Online Library, ijrcog, JMIR Publications, Taylor & Francis, and Cabi Digital Library. Although the number of publications from these publishers is smaller, their presence demonstrates the widespread dissemination of research related to electronic medical record completeness across various publishing platforms.

This distribution of publications reflects the diversity of information sources available to researchers and practitioners in the healthcare field. The dominance of publishers such as the IAA Digital Repository, Springer Link, and patents.google indicates that there are several key platforms that are the main references in this study. However, contributions from other publishers are also important in ensuring wider knowledge dissemination and accessibility of diverse research results.

Overall, these data illustrate the contribution of various publishers in supporting research on electronic medical record completion, suggesting that this topic is receiving attention from different publishing platforms, thus enriching the available scientific literature.

Discussion of Publication Trends by Citation

Based on citation trend analysis, the paper by Lodge et al. (2020) in "Taylor & Francis," which examined the completeness of medical records of surgical and obstetric patients in Tanzania, had the highest number of citations, 18. This indicates significant interest in the completeness of medical records, which likely reflects the challenges and importance of accurate data in healthcare settings, especially for surgical and obstetric patients.

Table 1. List of Journal Publishers By Citation

No.	Author	Title	Citation	Year	Country
1	Lodge, W., Menon, G., Kuchukhidze, S., Jumbam, D. T., Maongezi, S., Alidina,	Assessing the completeness of patient medical records of surgical and obstetric patients in Northern Tanzania	18	2020	Tanzania
2	Noloyiso Makeleni; Liezel Cilliers	Critical success factors to improve data quality of electronic medical records in public healthcare institutions	17	2021	South Africa
3	Ida Sugiarti	Legal Protection of Patient Rights to Completeness and Confidentiality in Management of Medical Record Documents	14	2019	Indonesia
4	Boniface Oyugi, Winfred Kabuti, Caroline Nyongesa	Improving the management of hypertension and diabetes: An implementation evaluation of an electronic medical record system in Nairobi County, Kenya	14	2020	Kenya
5	Xin (David) Ding, Xiaosong (David) Peng	The Impact of Electronic Medical Records on the Process of Care: Alignment with Complexity and Clinical Focus	9	2020	China

Next in line, a study by Makeleni and Cilliers (2021) published in "Sielo," discussing key factors for improving data quality in electronic medical records in South Africa, received 17 citations. It highlights the increasing focus on data quality in health systems, which is essential for effective patient management and health outcomes.

Ida Sugiarti's (2019) work on the legal protection of patient rights regarding medical records in Indonesia, published in "Atlantis Press," has 14 citations. This shows the growing concern and academic interest in the legal aspects of medical record management, emphasizing the importance of confidentiality and completeness in protecting patient rights.

Similarly, a publication by Oyugi, Kabuti, and Nyongesa (2020) in "Elsevier," which evaluated the application of electronic medical record systems to manage chronic diseases such as hypertension and diabetes in Kenya, also had 14 citations. This indicates a broader interest in utilizing technology to improve health outcomes in managing chronic conditions in developing regions. Finally, a paper by Ding and Peng (2020), published in "Wiley Online Library," which explored the impact of electronic medical records on the care process in China, received 9 citations. While this is the lowest among the listed papers, it still reflects meaningful engagement with the topic, especially regarding the alignment of electronic medical records with clinical complexity.

Overall, trends in citations indicate a strong academic and practical interest in the completeness, quality, and legal implications of medical records, as well as the role of electronic systems in improving healthcare in different regions. This focus likely reflects a broader global trend in healthcare towards improved data management, patient rights, and

integration of technology within the Healthcare system.

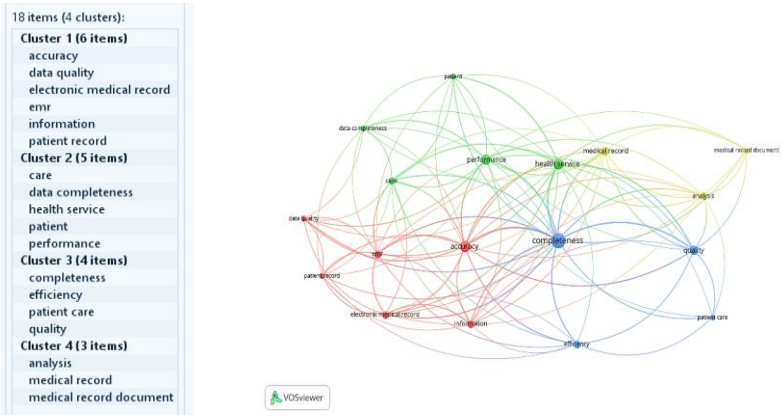

Figure 4. Network Visualization Overview Publications

Related Vos Viewer Network Visualization Publication Overview

Network visualization using VOS Viewer provides an overview of the main themes and relationships between topics in publications related to medical records and their management. The four main clusters identified indicate the various thematic foci that dominate this literature.

1. **Cluster 1** includes themes such as "accuracy," "data quality," "electronic medical record (EMR)," "information," and "patient record." This theme demonstrates the importance of data accuracy and quality in EMR systems. The focus on this cluster reflects academic and practical attention to how accurate and high-quality data can support better medical decision-making and ensure efficient management of patient information.
2. **Cluster 2** includes "care," "data completeness," "healthcare," "patients," and "performance." This shows the close relationship between data completeness in medical records and the quality of healthcare and service performance. Data completeness is crucial in ensuring that all aspects of patient care are recorded and accessible, ultimately contributing to improved quality of care and patient health outcomes.
3. **Cluster 3** covers "completeness," "efficiency," "quality," and "patient care." This cluster emphasizes the importance of data completeness in supporting operational efficiency and quality of care in healthcare. In this context, data completeness is not only seen from an administrative point of view, but also as an important factor in ensuring that patient care runs smoothly and is of high quality.
4. **Cluster 4** focuses on "analysis," "medical records," and "medical record documents." This theme shows interest in analytical processes and documentation related to medical records. Analysis of medical record data is considered important for evaluating health system performance, identifying trends and patterns in patient data, and improving medical information management and documentation processes.

Overall, this visualization highlights the importance of data integration and management in medical record systems, with a strong focus on quality, completeness and efficiency. This reflects the increasing need to effectively utilize health information technology, to support better healthcare delivery and improve patient health outcomes.

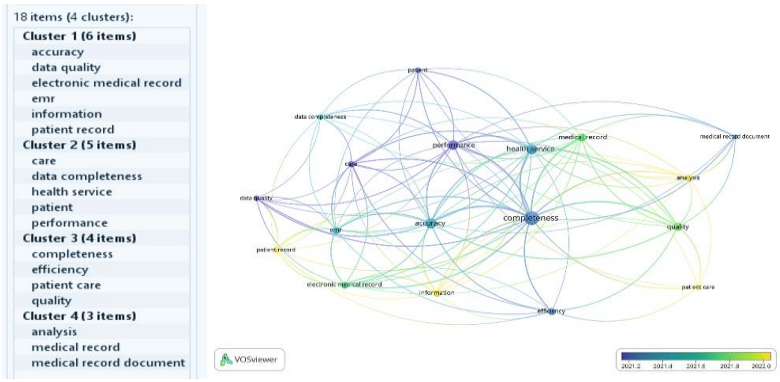

Figure 5. Overlay Visualization Overview Publications

VOSviewer Overlay Visualization Publication Overview

The overlay visualization of the VOS Viewer provides insight into the temporal progression of key themes in publications related to medical records and their management. Colors on the grid indicate the time of publication with a spectrum from blue (earlier) to yellow (more recent).

Topics such as "data quality" and "electronic medical record (EMR)" tend to be on the earlier side (blue), indicating that these are areas that have received significant attention early in the study period. The focus on data quality and EMR reflects early efforts to improve the reliability and efficiency of health information systems through technology.

On the other hand, themes such as "analysis," "medical records," and "quality" lean more towards the yellow color, indicating that these are topics that have received more recent attention. This indicates a growing interest in the analytical aspects of medical records management and how data can be used to evaluate and improve the quality of healthcare.

The centerpiece of the visualization, "completeness," emerged as a consistently important topic over time, suggesting that data completeness remains a major concern in the literature. Its strong relationship with other themes such as "accuracy," "efficiency," and "quality of patient care" suggests that data completeness is a fundamental element in effective health information management.

Overall, this visualization illustrates the shift in focus from implementation and basic quality data towards data analysis and strategic use of medical records to improve healthcare performance and quality. This reflects the evolution in the literature from technical and operational aspects towards a more strategic and data-driven approach.

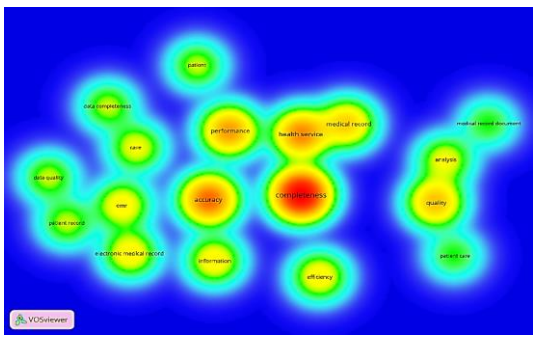

Figure 6. Density Visualization Overview Publications

VOSviewer Density Visualization Publication Overview

Density visualization using VOS Viewer reveals the intensity and frequency of research on various medical record-related topics, with color variations from blue (low density) to red (high density) reflecting how often the topic is covered in the literature.

The red center of the visualization shows that "completeness" is the most discussed topic, highlighting the importance of data completeness in medical records to support effective clinical decisions, accurate reporting, and comprehensive patient case management. Topics such as "precision," "healthcare," and "performance" also show high density, indicating a focus on using medical records to improve quality of care and operational effectiveness in the health system.

Data accuracy is crucial for proper diagnosis and treatment, while performance and health service evaluation are closely related to efforts to improve health outcomes through good data management. Furthermore, medium- to high-density themes such as "analysis," "quality," "patient care," "EMR," and "data quality" show great attention to how data is used to improve quality of care and system efficiency. Analysis of medical record data is becoming an important tool in evaluating and optimizing clinical processes, while the focus on EMR reflects the shift towards digitization of medical data for ease of access and integration. On the other hand, topics such as "medical record documents" and "information" that show lower density may reflect areas that require further research or less attention compared to other core topics.

This indicates that while clinical and technical aspects have been the main focus, there is still room for more exploration in the administrative and legal aspects of medical records management. Overall, this visualization reflects the importance of data completeness and accuracy in medical records, and shows a strong trend towards the use of information technology and analytics in improving the efficiency and quality of healthcare. It also indicates that while much attention has been paid to technical and clinical aspects, there is a need to expand research into other areas such as documentation and information management to achieve a more holistic and integrated health system.

CONCLUSIONS

This study aims to analyze bibliometrics related to the completeness of electronic medical record (EMR) filling by health workers using the Publish or Perish application with relevant keywords. The data collected came from Google Scholar, covering 30 journals with the highest rankings in the 2019-2024 period. The analysis was carried out on the distribution of journals based on the year of publication, type of journal, number of citations, and country of origin of the researchers. In addition, the analysis also used the VOS Viewer application to explore the interconnectedness of key themes and identify future research gaps.

From the results, it was found that the highest number of publications came from Indonesia, followed by the United States and Ethiopia, indicating geographical differences in the focus of research on EMR. The publisher that published the most articles was IAA Digital Repository, followed by Springer Link and patents.google, reflecting the diverse publication sources and distribution of the journal.

Temporal analysis showed an increase in the number of publications each year, with a peak in 2022. This trend reflects the increasing academic and professional interest in the topic of EMR completeness, which may be driven by developments in health information technology and the need for more accurate and complete patient data.

The VOS Viewer visualization with occurance 3 and term 18 showed key themes such as "completeness," "accuracy," "data quality," and "healthcare" to be strongly associated. The themes of

"completeness" and "accuracy" emerged as the center of the research network, indicating the importance of these aspects in electronic medical record management. Overlay and density analysis also revealed that this research has moved from a focus on technical aspects towards analyzing quality and efficiency in EMR use.

Overall, this study identified that there is an ongoing need to improve the completeness and accuracy of data in EMRs to support better clinical decision-making. Identified research gaps include further exploration of data quality improvement methods and integration of EMRs with other health information systems. Further research should also focus on policy and regulatory implications related to EMR completeness and its impact on healthcare quality and patient safety. The findings are expected to inform the development of better policies and practices in electronic medical record management in various global contexts.

LITERATURE

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