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ANALYSIS OF WORKLOAD IN HOSPITAL : A BIBLIOMETRIC STUDY

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ABSTRACT

This research explores hospital patient safety programs as critical to safe patient care, aiming to prevent malpractice-related deaths and medical errors that cause harm to patients. Focusing on hospital workload analysis, this study considers factors that affect response time, such as the availability of tools, infrastructure, emergency conditions, and manpower issues. Using a qualitative approach, this study examined teamwork among nurses from 2019 to 2023 using the Scopus and VOSviewer databases. With 2,602 documents, 2021 stood out with 794 studies, indicating the peak of Scopus-indexed hospital research publications on workload. Six clusters, mainly "Volume," were identified through VOSviewer. This research was very useful, but recognizing the limitations in data sources (scope only) and keyword restrictions, future research should include diverse databases such as Web of Science for a more comprehensive understanding.

Keywords: ER,Hospital,Patient safety,Response time,Workload.

ABSTRAK

Penelitian ini membahas program keselamatan pasien di rumah sakit sebagai hal yang sangat penting dalam memberikan pelayanan yang aman kepada pasien, yang bertujuan untuk mencegah kematian akibat malapraktik dan kesalahan medis yang membahayakan pasien. Berfokus pada analisis beban kerja rumah sakit, studi ini mempertimbangkan faktor-faktor yang memengaruhi waktu tanggap, seperti ketersediaan alat, infrastruktur, kondisi darurat, dan masalah ketenagakerjaan. Dengan menggunakan pendekatan kualitatif, penelitian ini meneliti kerja tim di antara para perawat dari tahun 2019 hingga 2023 dengan menggunakan database Scopus dan VOSviewer. Dengan 2.602 dokumen, tahun 2021 menonjol dengan 794 penelitian, yang menunjukkan puncak publikasi riset rumah sakit yang terindeks Scopus tentang beban kerja. Enam klaster, terutama "Volume", diidentifikasi melalui VOSviewer. Studi ini harapannya dapat bermanfaat, tetapi mengingat keterbatasan sumber data (hanya Scopus) dan pembatasan kata kunci, penelitian di masa depan harus menyertakan database yang beragam seperti Web of Science untuk pemahaman yang lebih komprehensif.

Kata kunci: Beban Kerja, IGD, Keselamatan pasien, Respon time, Rumah sakit.

INTRODUCTION

Emergency services are the human rights of every community and obligations that must be carried out by health care providers. The government and the community are responsible for maintaining and improving the quality of health services in emergencies as the main part of health development so that its implementation becomes a structured system (Mahrur and Yuniar, 2016). In the emergency room, patients are handled and served not based on queues or sequence numbers as well as services in poly or general practitioners or at health centers. IGD services refer to the concept of a system of being served based on the severity of the ESI Kurn where the patient will be treated (Tasa, 2022). This is in accordance with the (Istiningtyas, 2020), A person's situational awareness reflects how well they are able to adapt to their surroundings. According to (Lambrini et al., 2021), quality health services are those that aim to satisfy both the average and individual levels of satisfaction with the service. Customers are satisfied when their wants, desires, and expectations are met by the products offered. Contentment or dissatisfaction is the emotion that develops when one evaluates the product or service's actual performance in relation to one's expectations (World Health Organization, 2020).

Based on data from the Indonesian Minister of Health, in 2014 patient visits to the Indonesian emergency room reached 4 million patients (13.3%) of the total visits in public hospitals (Alshathri, n.d.). Meanwhile, IGD visits in Bantul Regency in 2020 were 64,094 patients (health profile of Bantul Regency) and in 2021 the number of patient visits was 2,081,975 (Christos Iliadis et al., 2021). Every year Emergency patients experience an increase that will cause various problems for both sufferers and health professionals and the Hospital (Gu et al., 2022). The World Health Organisation lists ischemic heart disease as one of seven "emergency diseases" that are among the leading causes of death globally. 7.3 million (or 13.2% of the total), 76.7 million (or 11.9% of the total), 3.1 million (or 5.6% of the total), 3.1 million (or 5.5% of the total), and 1.6 million (or 2.9% of the total) died from cancer. Even in Asean countries, the disease's urgency is a major concern.

Amidst the ever-evolving dynamics of the healthcare system, hospitals as healthcare centers are facing major challenges related to the increasing workload of medical professionals and healthcare staff (Adha & Aini, 2023). This phenomenon includes not only an increase in patient volume but also changes in disease complexity, evolving medical technology, and increasingly stringent regulatory demands. This creates an environment where patient care requires additional effort, more efficient coordination, and optimal resource management (Birhanu et

al., 2018). The increased workload in hospitals has created a series of impacts that can affect both medical personnel and patients. The first impact is a potential decrease in the well-being and satisfaction of medical personnel (Yeyi Gusla Nengsih, 2023). The increased amount of work, heavy workload, and time pressure can lead to physical and mental fatigue, increased stress levels, and reduced job satisfaction among healthcare professionals (Junaidah et al., 2023). This can affect the quality of care provided and increase the risk of burnout among healthcare staff.The second impact is a potential decrease in the quality of care provided to patients (Macphee et al., 2017).

High workloads can hinder the coordination of medical teams, result in delays in the treatment process, and increase the risk of medical errors (Alfian & Rahmana, 2023). Patients may experience longer waiting times, decreased individual attention, and a decreased quality of communication between health workers and patients (Lestari et al., 2023). Another significant impact is related to the sustainability aspect of the health system. Poorly managed workloads can lead to inefficient use of resources, increased operational costs, and potential unsustainability in delivering quality healthcare. Thus, the importance of workload analysis in hospitals is to improve the demands of health services and patient welfare (Cortez et al., 2017).

These issues not only affect the well-being of medical and healthcare staff but can also impact the quality of care provided to patients. Therefore, an in-depth understanding of workload in hospitals is essential to designing effective management strategies, improving operational efficiency, and ensuring quality health services.In the context of bibliometric studies, this research is expected to make an important contribution in summarizing, analyzing, and presenting the latest scientific information related to workload in hospitals (Pedersen et al., 2023). Through this approach, researchers can identify research trends, key concepts, and best practices that have emerged in the scientific literature. Thus, the results of this study are expected to provide an in-depth and sustained view of this important issue while also laying the foundation for improving the health system in hospitals.

METHOD

This study employs the Scopus search engine to identify literature on hospital workload. The research is a quantitative study that utilizes a bibliometric analysis approach (Donthu et al., 2021). The Scopus database will be the primary source for this inquiry. The data collection took place on February 14, 2023. SCOPUS is a comprehensive database that aggregates and curates a wide range of peer-reviewed scientific papers from throughout the globe (Aksnes & Sivertsen, 2019). The characteristic analysis technique utilized data extracted from review articles and publications published within the timeframe of 2019 to 2023. The data is categorized and displayed according to many criteria, including year, nation, type of publication, publishing institution, name of researcher, and research subject(Effendy et al., 2021). A grand total of 2602 reviews and journal articles were acquired, encompassing publication details, abstracts, bibliographies, and other pertinent information. The Scopus Analyzing Tools scrutinized the search results based on the criteria of year, country or region, subject, author, and source (Kirby et al., 2023). The VOS viewer version 1.6.18 was utilized for the purpose of visualizing and creating bibliometric maps. The process of collecting and analyzing data is depicted here.

Research Stage

The following are the stages of the analysis process in this study.

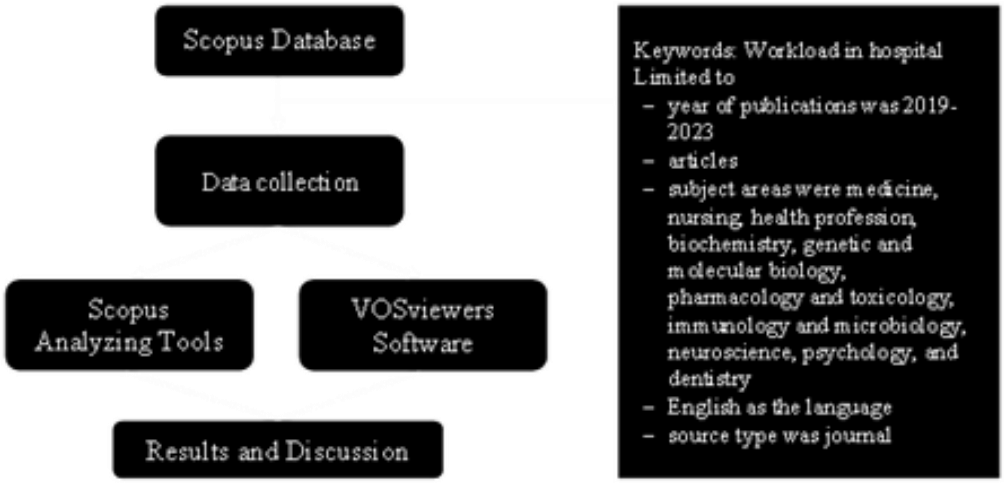

Figure 1. Research Flow Stages

RESULT

Analysis document by year

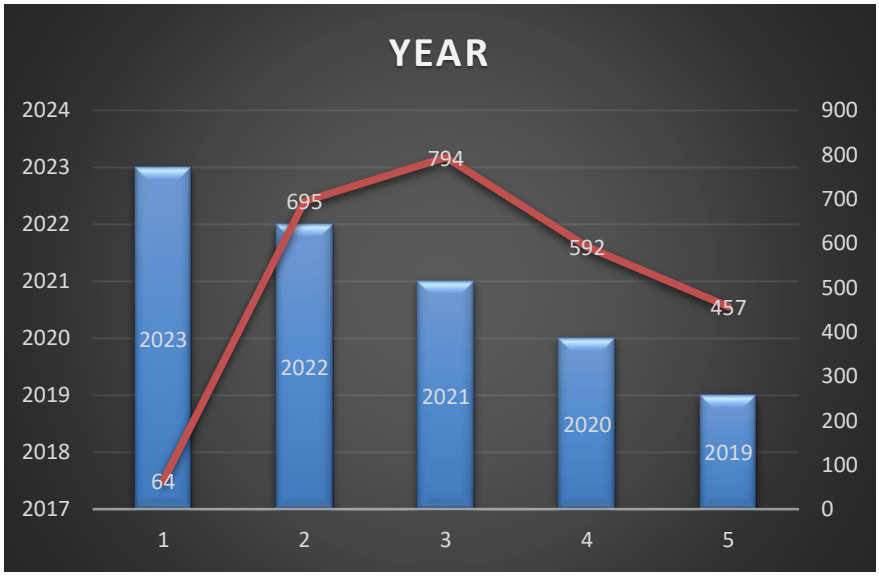

Figure 2. Documents by year

Illustrates the pattern of publication in this study. In 2021, there were 794 pieces of research published, making it the year with the highest number of publications. The number of publications has declined from 695 studies in 2022 to 592 studies in 2020 and 2019. The minimal threshold for keyword occurrences in all evaluated research publications using VOS Reader was set at 15.

Analysis document by country

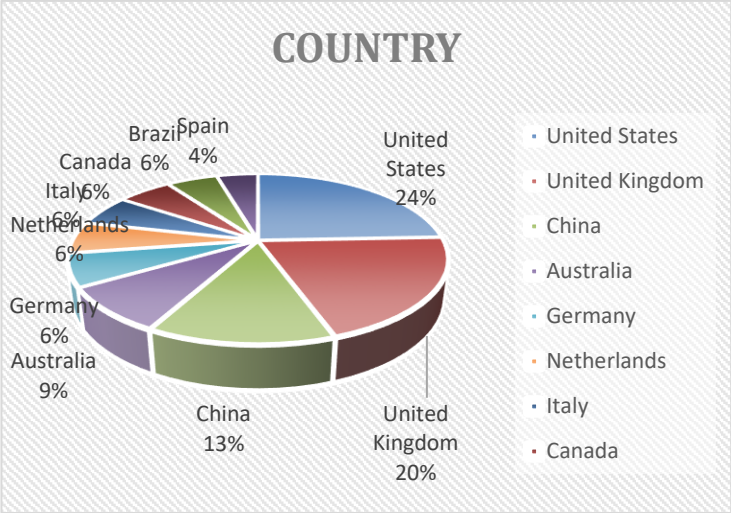

Figure 3. Document by country

The top 10 countries were determined by analyzing the country of origin of publications that were included in the Scopus database between 2019 and 2023. Multiple nations made contributions to the publications linked to this research. Figure 3 indicates that the United States is the leading country in terms of publication contribution, accounting for 24% of the total. Following closely behind is the United Kingdom, with 20% of the documents.

Analysis document by subject

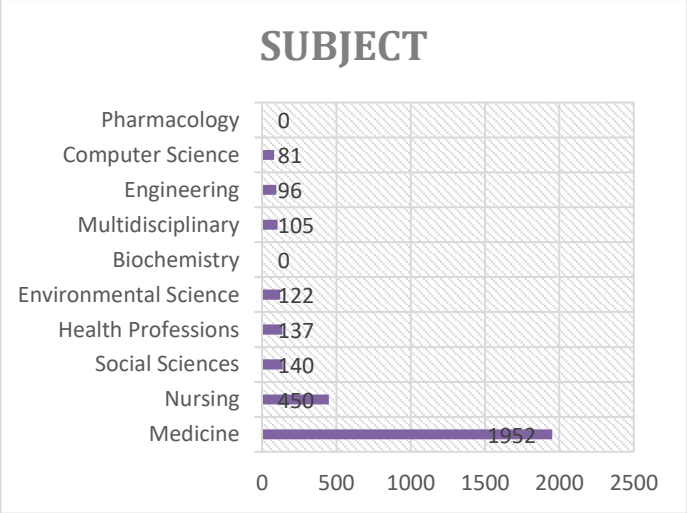

Figure 4. Document by subject area

According to Figure 4, medicine has published the most research, totaling 1952, on the topic of workload in hospitals. Nursing ranks second in terms of research output, with a total of 450 studies.

Analysis document by author

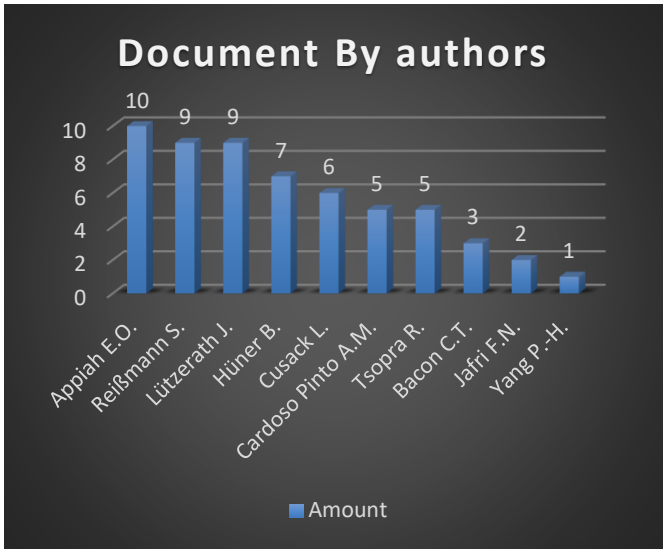

Figure 5. Documents by authors

According to the analysis conducted by researchers studying the impact on hospital workload, it was discovered that the top 10 researchers had the highest number of publications. Appiah E.O was the most prolific researcher, having authored 10 papers.

Analysis document by affiliation

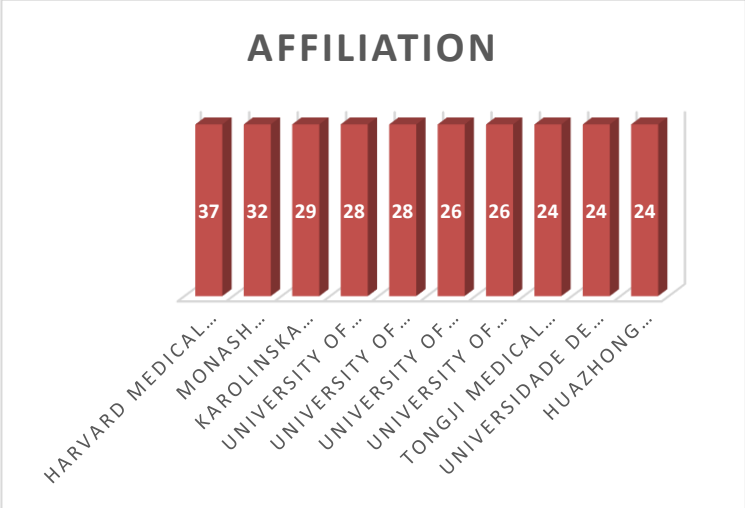

Figure 6. Document by affiliation

The researcher chose the top 10 affiliations as the place of publication based on a study of the author's affiliation with the contribution to hospital workload. Harvard Medical School has made the greatest contribution to this topic, with 37 studies indexed by Scopus. Monash University has 32 academic programs, whereas all other universities have less than 29.

Analysis document by source

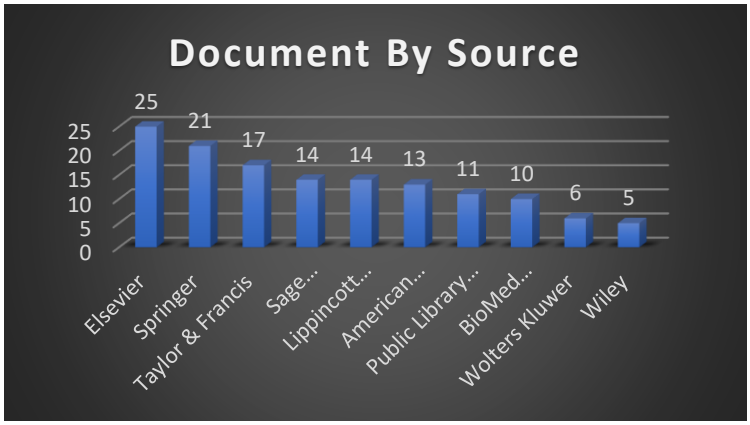

Figure 7. Document by source

The researchers embarked on an extensive investigation into the landscape of journal publishing to discern the critical insights surrounding hospital workload from 2019 to 2023. The findings revealed a comprehensive list of the top 10 most prolific journal publishers, shedding light on the magnitude of scholarly contributions in this field. Topping the list is Elsevier, emerging as the leading publisher with a substantial 25 publications during the specified period. Following closely behind, Springer secured the second position with 21 publications, while Taylor & Francis claimed the third spot with 17 publications. Notably, Sage Publications and Lippincott Williams & Wilkins shared the fourth position, each boasting 14 publications. The American Medical Association (AMA) made a significant contribution with 13 publications, further underlining its influence in disseminating knowledge on hospital workload. Public Library of Science (PLOS) and BioMed Central (BMC) secured the seventh and eighth positions with 11 and 10 publications, respectively. Wolters Kluwer, with 6 publications, and Wiley, with 5 publications, completed the top 10 list. This comprehensive analysis not only highlights the major players in publishing but also underscores the depth and breadth of research dedicated to understanding and addressing the intricacies of hospital workload within the specified timeframe.

Mapping Visualisation Networking

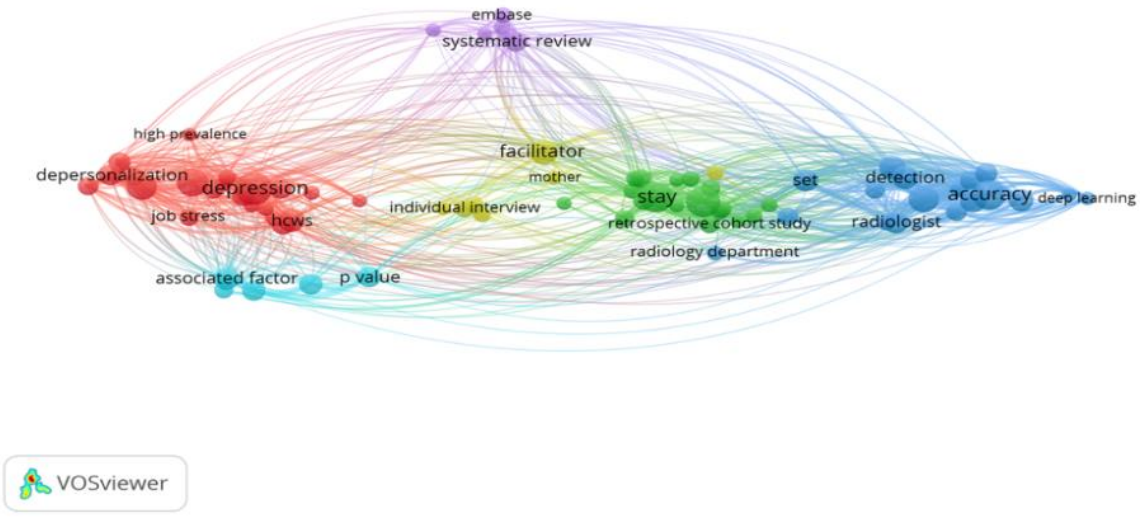

Figure 8. Mapping Visualization Networking

The colors symbolize the clusters. The magnitude of the point corresponds to the frequency of the occurrence of the keyword. Each point is connected by a line that reflects the co-occurrence of terms within the same article (Susilawati et al., 2023). Clustering is employed to delineate bibliometric grouping, whereas mapping is utilized to obtain a holistic depiction of the bibliometric network. Table 1 provides a description of each cluster and its corresponding components.

Cluster	Keywords	Colour
1	Burnout syndrome,cross sectional design,depersonalization, depression,emotional exhaustion,frontline,hcw,hcws,high level, high prevalence,higher level,higher score,insomnia,job stress, low level,maslach burnout inventory,occupational stress, personal accomplishment,psychological distress,psychological impact,second wave (21 items)	Red
2	Adult patient,day mortality,elective surgery,hospital mortality, interquartile range,mechanical ventilation,median age, mortality rate,nursing activities score,patient characteristic, retrospective cohort study,secondary outcome, significant reduction, stay, time period,volume,week period,year period (18 items).	Green
3	Accuracy,algorithm,artificial intelligence,classification,dataset, deep learning,detection,image,machine,pneumonia,precision, radiologist,radiology department,retrospective study,sensitivity, set,specificity,validation. (18 items)	Blue
4	Acceptability,facilitator,individual interview,interview guide, main theme,mother,qualitative approach. (7 items)	Yellow
5	Cinahl,embase,medline,meta analysis,pubmed, systematic review. (6 items)	Purple
6	Aor,associated factor,Ethiopia,p value,spss version. (5 items)	Tosca

Table 1. The Clusters of Bibliometric Analysis

Cluster 2 exhibits the greatest frequency of occurrences and has the highest total connection strength. According to Table 2, cluster 1 had a total of 63 incidences of emotional exhaustion. Next in line is Volume, which likewise experienced 81 events from Cluster 2. The top-ranked keyword in Cluster 3 is "accuracy," with a total of 70 instances

Keyword	Occurrences	Total Link Strength
Volume	81	111
Accuracy	70	202
Emotional exhaustion	63	191
Facilitator	52	70
Associated factor	43	102
Systematic review	33	85

Table 2. The Top 6 Occurrence and Total Link Strength of Keywords

Conversely, VOS viewers employ the fundamental hues of red, green, and blue (RGB) in all of their visualizations. Density visualization is employed to observe the level or quantity of density pertaining to the subject being examined. The level of yellow coloration in a node directly corresponds to the extent of research that has been carried out on that particular topic. On the other hand, nodes that are more green indicate a lower amount of research conducted on that particular issue. Figure 8 illustrates the mapping density of the topic of this research using Scopus.

Mapping Visualization Density

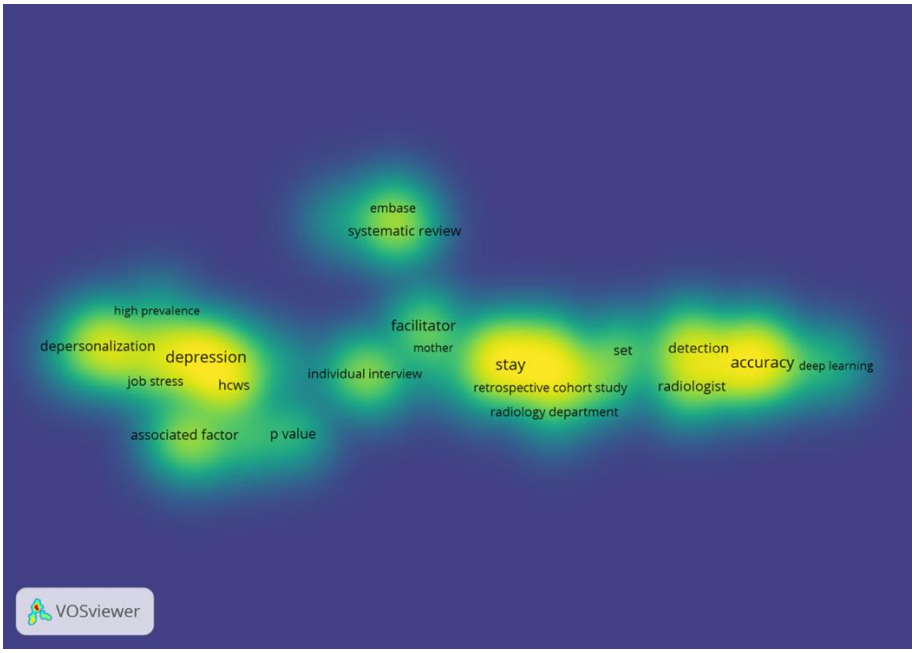

Figure 9. Mapping Overlay Density

The level of density is determined by the frequency of keywords that appear and are highlighted in yellow, such as dimension and patient safety culture; the less frequent green keyword is gender, while variance appears less frequently.

DISCUSSION

The duration between when a terminal operator finishes an inquiry and when they receive a response. Response time encompasses the duration required to send the inquiry, process it through the computer, and then deliver the response back to the terminal. Response time is commonly employed as a metric to evaluate the efficiency of an interactive system. Response time refers to the duration between the patient's arrival at the hospital entrance and the moment they receive a response or assistance from two emergency installation officials, until the emergency situation is fully addressed. Response time refers to the duration it takes for patients to receive assistance based on the urgency of their medical condition from the moment they visit the emergency room.

Response time is an indicator of the quality of service in a hospital. Response time is also grouped with priority P1 with 0 minutes of handling, P2 with <30 minutes of handling, P3 with <60 minutes of handling. This can be achieved by improving facilities, infrastructure, human resources and management of the hospital emergency room according to standards. Response time or response time is the speed of treatment time that starts from the patient coming to the emergency room until the patient gets initial action due to the health problem he is experiencing. While triage is the act of selecting and sorting patients based on the priority of their emergency level.

The appropriate execution of triage significantly impacts reaction time. If triage is not conducted correctly, it will impede the promptness of the patient's care, hence increasing the likelihood of organ damage, disability, and even mortality. Furthermore, it will also have an impact on the caliber of healthcare services provided by hospitals. Reducing triage

scale assessments or triage inaccuracies will prolong the treatment time that patients should receive according to their clinical conditions and will then risk reducing patient safety rates and the quality of health services. Emergency patients must be handled within < 5 minutes. A prolonged response time in handling emergency patients can reduce efforts to save patients.

Internal and external

Reducing triage scale assessments or triage inaccuracies will prolong the treatment time that patients should receive according to their clinical conditions and will then risk reducing patient safety rates and the quality of health services. Emergency patients must be handled within < 5 minutes. A prolonged response time in handling emergency patients can reduce efforts to save patients. Response time on a real-time system is defined as the time at which events (internal and external) occur until the first instruction of the intended service routine is executed, called the event response time. The goal of this scheduling is to minimize the response time, the delay rate for the first emergency service/emergency response time rate. The factors that contribute to delays in handling emergency cases can be categorized as internal and external. Internal factors include the patient's condition, staff allocation, the availability of stretchers, and the presence of healthcare workers. External factors include the time of patient arrival, the effectiveness of management protocols, and the chosen examination and treatment approach.

Response time strategy

Furthermore, the determinants impacting reaction time encompass response time strategies, specifically the velocity and precision of services rendered by a hospital, which can instill trust in clients and encourage their consistent utilization of healthcare services at such institutions. The response time strategy refers to the promptness and precision of services provided by a hospital, which instills confidence in clients to consistently utilize healthcare services at the hospital. The speed and accuracy of the help given to patients who come to the Emergency Room requires standards according to their competence and abilities so that they can guarantee an emergency treatment with a fast response time and proper handling. This can be achieved by improving the facilities, infrastructure, human resources and management of the Hospital Emergency Installation according to standards. The Hospital Emergency Room (IGD) has the task of providing temporary medical services and nursing care as well as emergency surgical services for patients who come with medical emergencies in a friendly, polite, orderly and responsible manner. The speed of service of emergency room staff is an indicator of hospital service standards to measure response time, which is the cumulative time required for emergency room staff to serve 5 minutes after the arrival of patients. Patients can provide fast and comprehensive service and interact with patients. emergency department.

Based on a study by Saint Nashrah Asia factors related to the response time of handling cases in the emergency room include Availability of stretchers. The Canadian Association of Emergency Physicians writes that inadequate stretchers to treat patients in the emergency department can have serious consequences for new patients in critical condition. Therefore, the treatment of these patients will be difficult due to the lack of stretchers. The insufficiency of the availability of stretchers in the treatment of patients in the emergency room would have serious consequences for new patients where the patient is in a critical condition. Thus, the treatment of these patients will be hampered due to the inadequate availability of stretchers.

Availability of triage officers

When a patient enters the emergency department, the first step is to triage the patient and determine the priority of the intervention, but if triage staff is not available, failure to do this is very influential (Youngcharoen & Aree-Ue, 2023). Incoming patients will gather in the same room without priority. The availability of triage officers is very influential because when a patient enters the emergency room, the first time the patient will be triage grouped first to determine the priority of action, but if the triage officer is not available then this is not done so that the patients who enter will gather in one room without priority classification. handling and making the officer who will take action become a cauldron.

Characteristic level in the patient

The condition of the patient entering the ER depends on the nurse's response time, and the more serious the patient's condition, the faster the nurse's response time must be because it is related to the life and safety of the patient. Factor in the knowledge of health workers and the work experience of health workers working in emergencies.

Physical workloads

While this line of inquiry has been on the rise in recent years, the survey found that it was declining in 2022. This further establishes that American authors are the most prolific (Chandra & Putriana, 2023). The fact that half of the top ten papers are from American institutions lends credence to this idea, with Harvard Medical School contributing the most. VOSviewer, in distinction. One way to show how dense something is is through density visualization. A node's yellowness indicates the amount of study conducted on that particular issue. On the other hand, less research is being conducted on a subject whose node color is green.

CONCLUSIONS

Through a meticulous bibliometric analysis, this investigation unveils a substantial corpus of research, offering valuable insights into the intricate landscape of hospital workload studies. The findings underscore the pivotal role of the year 2021, serving as a zenith in the volume of Scopus-indexed publications dedicated to hospital workload research. Notably, the United States emerges as the primary contributor to this scholarly discourse, with the prestigious affiliation of Harvard Medical School prominently represented. Within the expansive field of medicine, a discernible concentration of research output is evident. In addition, an in-depth analysis using VOS viewers exposes the existence of six distinct clusters based on keywords. Of particular significance is the prominence of the "Volume" cluster, characterized by the highest frequency and total link strength, indicative of its central position within the broader discourse on hospital workload. Despite the richness of these findings, it is imperative to acknowledge the study's inherent limitations.

The exclusive reliance on the Scopus database as the sole source of data imposes constraints on the study's scope, and the use of predefined keywords introduces an element of restriction. Therefore, it is recommended that future investigations transcend these limitations. A more nuanced exploration can be achieved by incorporating data from alternative sources, such as the Web of Science. By expanding the dataset to include diverse global research databases, subsequent studies can transcend the confines of singular databases, providing a more holistic understanding of the multifaceted dimensions inherent in hospital workload research. This methodological enhancement ensures a more comprehensive and robust foundation for scholarly inquiry into the intricacies of hospital

workload

ETHICAL CONSIDERATIONS

Funding Statement

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- No funding was received to assist with the preparation of this manuscript.
- No funding was received for conducting this study.
- No funds, grants, or other support was received.

Conflict of Interest Statement

We would like to inform that in the process of submitting this publication, we acknowledge that we work in a hospital that has As medical personnel involved in this program, we strive to provide optimal services to patients, especially to the families of patients who are unable to be physically present to meet directly with the Doctor in Charge (DPJP). However, we also recognise that as part of the hospital team, our interests may influence the assessment and interpretation of our study results. Therefore, we are committed to transparently disclosing this and maintaining integrity and objectivity in our publication process. We hope that this study can provide a comprehensive picture of workload in hospital and an important reference in the development of future hospital service programs.

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