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Bibliometric analysis of the 200 most cited papers in the journal *Vojnosanitetski pregled*

Bibliometrijska analiza 200 najcitiranijih radova časopisa *Vojnosanitetski pregled*

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Abstract

Background/Aim. *Vojnosanitetski pregled* (VSP) is the official scientific and professional journal of the University of Defence in Belgrade, Serbia. VSP is a peer-reviewed journal that publishes a wide range of scientific and professional articles. The aim of the study was to perform a bibliometric analysis of the 200 most cited articles published in VSP, and to as-sess the impact, significance, and scientific contribution of the journal. **Methods.** Using the Web of Science (WoS) Core Collection (WoSCC) database, 2,664 articles published from 2008 to December 31, 2022, were analyzed, focusing on citation counts, author productivity, and collaboration networks. **Results.** The analysis revealed that the majority of the most cited articles came from Serbian institutions, with the University of Belgrade being the most prolific contributor. The top five most cited authors as well as the most cited article were identified, and a trend of increasing significance of research on bioactive compounds was noticed. The study also observed a shift in key word usage over time, reflecting changes in research trends within the journal. The collaboration network analysis showed a strong clustering among the leading authors, indicating a collaborative culture that contributes to the journal's influence. **Conclusion.** Emphasizing the importance of targeted collaborations makes it evident that maintaining and expanding the journal's impact on the scientific community is the key to improving medical research. Despite limitations such as reliance on a single database, the findings provide valuable insights into the journal's role in advancing medical research and highlight the importance of targeted collaboration.

Key words:
bibliometrics; interdisciplinary communication; journal impact factor; research.

Apstrakt

Uvod/Cilj. Vojnosanitetski pregled (VSP) je naučni i stručni časopis Univerziteta odbrane u Beogradu, Srbija. VSP je časopis sa recenziranim radovima, koji objavljuje širok spektar naučnih i stručnih članaka. Cilj studije bio je da se izvrši bibliometrijska analiza 200 najcitiranijih članaka objavljenih u VSP-u, i da se procene uticaj, značaj i naučni doprinos časopisa. **Metode.** Korišćenjem baze podataka *Web of Science* (WoS) *Core Collection* (WoSCC), analizirano je 2 664 članaka objavljenih od 2008. do 31. decembra 2022. godine, sa fokusom na broj citata, produktivnost autora i mreže saradnje. **Rezultati.** Analiza je pokazala da je većina najcitiranijih članaka potekla iz srpskih institucija, pri čemu je Univerzitet u Beogradu imao najplodniji doprinos. Identifikovano je prvih pet najcitiranijih autora kao i najcitiraniji članak, i zapažen je trend porasta značaja istraživanja bioaktivnih jedinjenja. Uočena je i promena u korišćenju ključnih reči tokom vremena, koja odražava promene u istraživačkim trendovima u okviru časopisa. Analiza mreže saradnje pokazala je snažno grupisanje vodećih autora, što ukazuje na kulturu saradnje koja doprinosi uticaju časopisa. **Zaključak.** Isticanjem važnosti ciljanih saradnji evidentno je da je održavanje i proširivanje uticaja časopisa na naučnu zajednicu ključno za unapređenje medicinskih istraživanja. Uprkos ograničenjima, kao što je oslanjanje na samo jednu bazu podataka, nalazi pružaju dragocene uvide u ulogu časopisa u unapređenju medicinskog istraživanja i naglašavaju važnost ciljanih saradnji.

Ključne reči:
bibliometrija; komunikacija, interdisciplinarna; časopis, impakt faktor; istraživanja.

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Introduction

Vojnosanitetski pregled (VSP) is the official scientific and professional journal of the University of Defence in Belgrade, Serbia [1]. It is a peer-reviewed journal that publishes original research, review articles, and case reports on a wide range of topics related to military medicine, including surgery, internal medicine, neurology, otorhinolaryngology, dermatology, radiology, and anesthesiology [2]. The journal also publishes editorials, book reviews, and reports on scientific meetings and conferences. VSP is published in English, but the abstracts are written both in Serbian and English. The journal is available online through the website https://www.vsp.mod.gov.rs. It is indexed in several databases, including PubMed (1950-2017), Web of Science (WoS) Core Collection (WoSCC), and Scopus [3]. Several factors can influence the impact and influence of a scientific journal, such as the quality of the research published, the journal's reputation, the editorial board, the number of citations received by its articles, and the journal's visibility and accessibility. Other influential factors include the journal's impact factor (citation frequency of the journal's articles) and the submission and acceptance rates, which indicate the journal's competitiveness and selectivity [4, 5]. Ultimately, the influence of a scientific journal depends on the recognition and respect it garners from the scientific community, influenced by various factors [6]. Bibliometric analysis is a study of publication characteristics, such as citation counts or impact factors, that can be used to evaluate the quality and significance of the work. Bibliometric analyses are often employed to assess the impact of research or identify trends in a particular field [7, 8]. They are useful for identifying influential scholars, institutions, or research topics and comparing the relative importance of different publications. Common metrics used in bibliometric analysis include citation counts, impact factor, and the H-index, which measures the productivity and impact of a researcher's work [9, 10]. However, it is important to acknowledge that bibliometric analyses have limitations and should be used with caution, as they do not always accurately reflect the quality or importance of a publication. Conducting a bibliometric analysis of VSP can serve several purposes. For instance, such an analysis can provide insight into the journal's impact and influence, its authors' productivity and citation patterns, and broader trends within the field. This information is valuable for researchers, institutions, and funding agencies because it can help them evaluate the quality and significance of the research published in the journal and identify emerging trends and patterns in military medicine and related fields.

This study presents a bibliometric analysis of the 200 most cited articles in VSP. The primary aim was to evaluate the impact and influence of the journal, as well as to understand the scholarly contributions and citation patterns.

Methods

The WoS database analysis was performed from January 1, 2008 to December 31, 2022, for manuscripts published in VSP. The search of the WoSCC using the search term "vojnosanitetski pregled" returned 2,664 articles. The year 2008 was selected to align with the impact factor (IF) calculation process, which considers citation data from two years prior. This choice allows us to capture the earliest relevant citation activity that contributes to the journal's IF, offering a comprehensive view of its scholarly impact from the beginning of the IF assessment period. Starting in 2008, we ensure a more accurate and representative analysis of the journal's influence over time. Manuscripts were ranked according to citation count, and the 200 most cited articles, along with their publishing data assorted into digital files, were analyzed. The top 200 most cited articles were selected as they represent the most impactful and frequently referenced studies within the journal, providing a focused view of the core contributions that have shaped its academic reputation. Analyzing this subset allows for a meaningful evaluation of the journal's influence on the scientific community by highlighting the research that has gained the greatest recognition and citation over time. This text file was imported into Bibliometrix [11] software, where a detailed analysis was performed. The results were presented in tables and figures. The WoS database was chosen for its high recognition and established credibility in assessing journal impact and citation metrics. The WoS is considered a more selective database, indexing only journals that meet stringent quality standards, which makes it particularly suitable for evaluating the global influence of a journal. Additionally, using the WoS provides consistent and comparable citation data, aligning with the aim of the study to provide a robust bibliometric analysis based on the most authoritative source. Within this analysis, a directed graph visualizes elements as nodes, with the connections between them represented by links. Nodes that share the same color are grouped into clusters or communities. The size of each node and its labels reflect its significance, with larger nodes indicating a greater number of connections to others. The length of the links demonstrates the strength of the relationship between nodes, and shorter links denote stronger connections.

Results

A total of 200 VSP publications with the highest citation count were mostly written by authors from Serbia (178 articles, 2,233 citations), followed by authors from Montenegro (6 articles, 62 citations), North Macedonia (4 articles, 50 citations), Bosnia and Herzegovina (4 articles, 46 citations), and Romania (2 articles, 35 citations) (Figure 1).

Authors from the University of Belgrade contributed to 161 articles, the University of Defence in Belgrade to 105 articles, the University of Novi Sad, Serbia to 46 articles, and the University of Kragujevac, Serbia and the University of Niš, Serbia to 43 articles each (Table 1).

The top five authors were Jovanović Milan (13 publications, 174 citations, H-index 10), Lazić Zoran (8 publications, 103 citations, H-index 8), Janković Slobodan (6 publications, 96 citations, H-index 8), Stojanović Miodrag (6 publications, 75 citations, H-index 6), and Pekmezović Tatjana (5 publications, 65 citations, H-index 5) (Table 2). The authorship timeline is given in Figure 2.

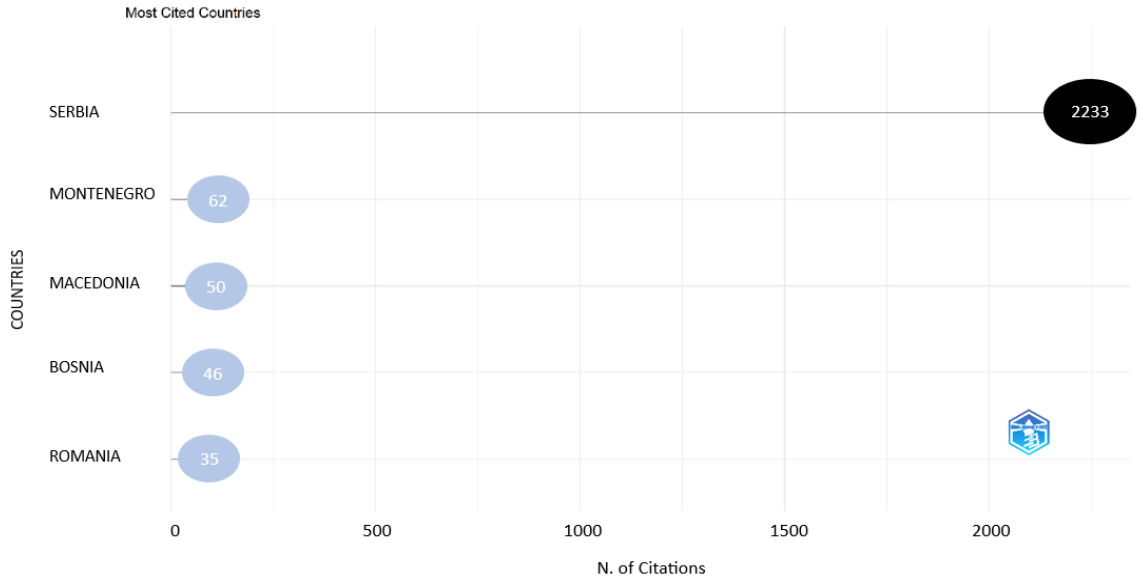

Fig. 1 – Most cited countries.

Table 1

Institutional contribution

Institution	Publication count
University of Belgrade, Belgrade, Serbia	161
University of Defence, Belgrade, Serbia	105
University of Novi Sad, Novi Sad, Serbia	46
University of Niš, Niš, Serbia	43
University of Kragujevac, Kragujevac, Serbia	43

Table 2

Top 5 authors

Author	Publication count	Citation count	H-index
Jovanović Milan	13	174	10
Lazić Zoran	8	103	8
Janković Slobodan	6	96	8
Stojanović Miodrag	6	75	6
Pekmezović Tatjana	5	65	5

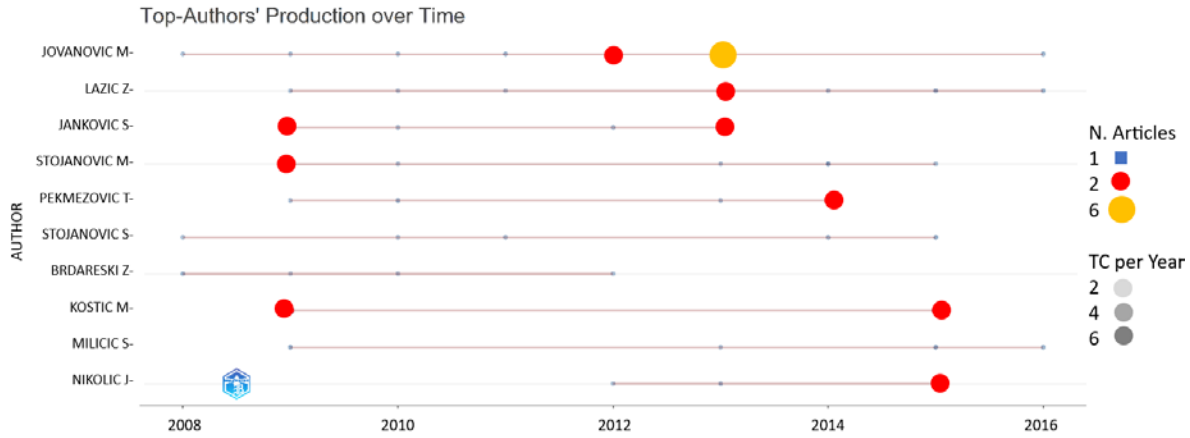

Fig. 2 – Top 10 author production timeline.

The document with the highest citation count was authored by Kuntić V, Brborić J, Holclajtner-Antunović I, and Uskoković-Marković S, titled "Evaluating the bioactive effects of flavonoid hesperidin – a new literature data survey," published in VSP in January 2014. It was cited 38 times in the WoSCC. The authors with the most co-authorship connections were Jovanović Milan and Lazić Zoran; the latter author's network inter-acted with three other networks (Figure 3). This figure illustrates the collaboration networks among the most prolific authors, highlighting the

strength and extent of their collaborative efforts. The size of the nodes indicates the number of articles published by each author, while the thickness of the links represents the strength of co-authorship connections. The five most common key words were “treatment outcome” (27 occurrences), “risk factors” (25 occurrences), “serbia” (19 occurrences), “diagnosis” (18 occurrences), and “quality of life” (17 occurrences). The timeline of word dynamics, key word evolution, and thematic mapping is presented in Figures 4, 5, and 6.

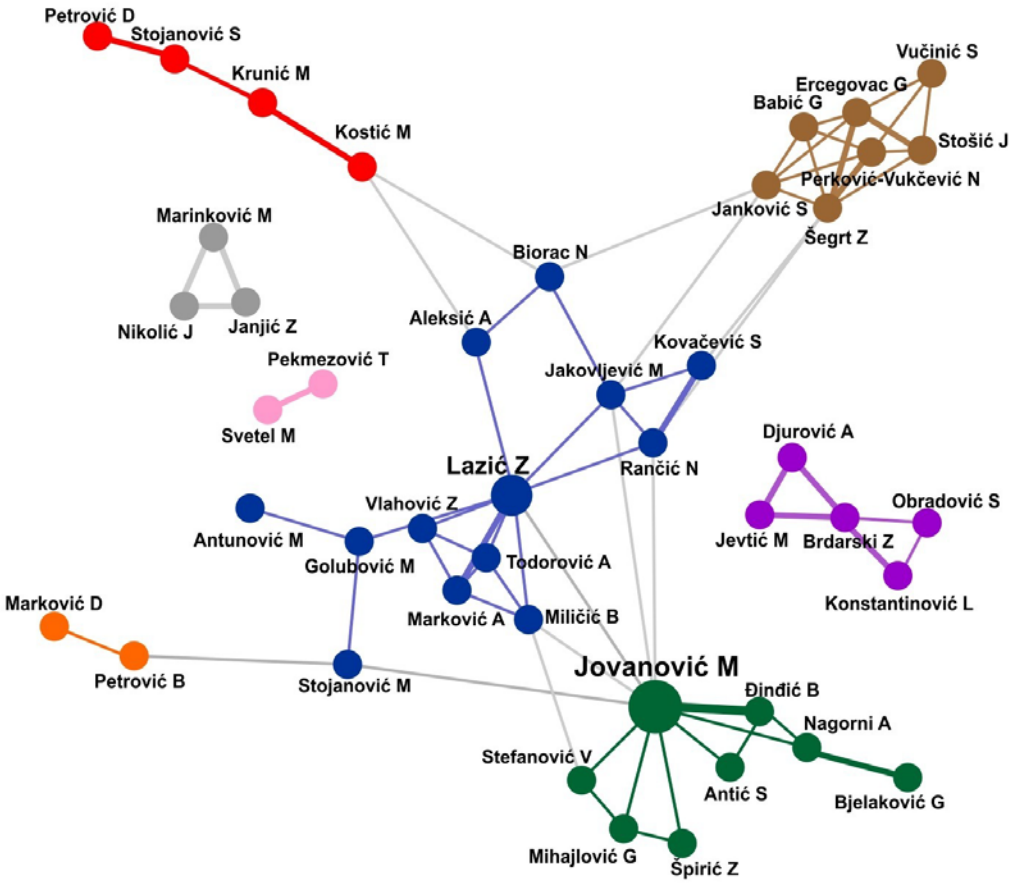

Fig. 3 – Collaboration network.

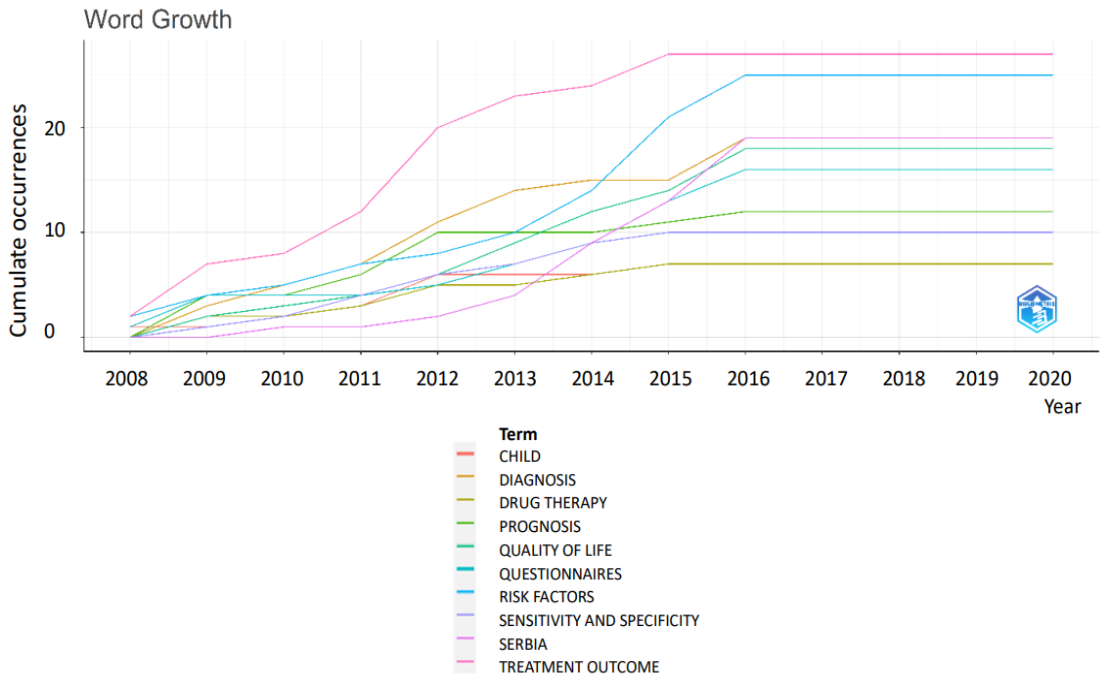

Fig. 4 – Key word dynamic.

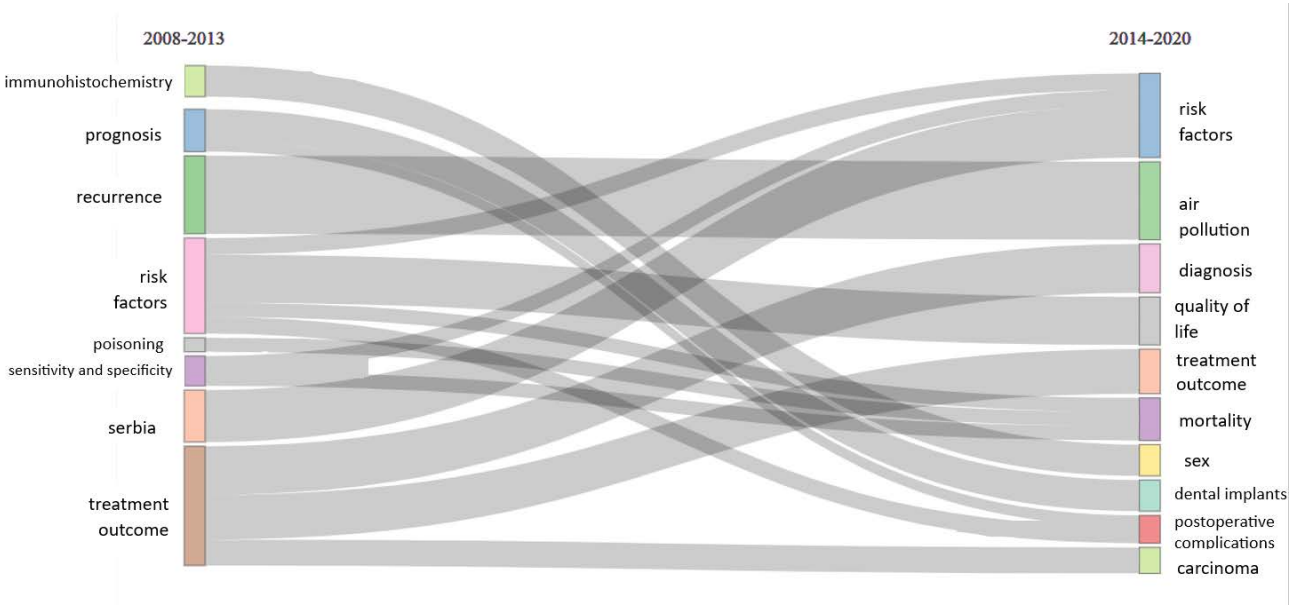

Fig. 5 – Key word evolution.

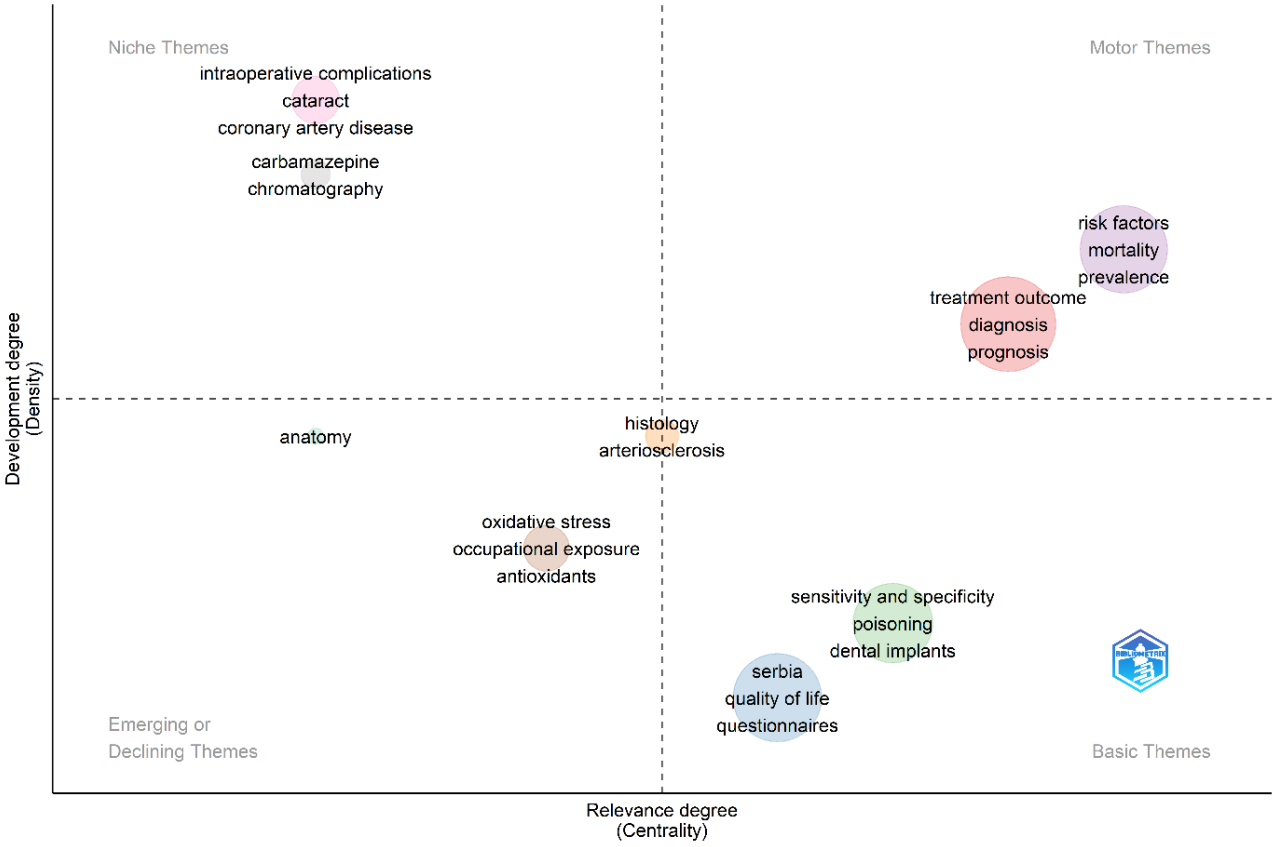

Fig. 6 – Key word thematic map.

Discussion

The analysis identified Jovanović Milan as the most cited author, with the highest number of publications and the highest H-index. The most cited individual article was authored by Kuntić V et al. [12], highlighting the influence of research on bioactive compounds in the journal's citation landscape. The key word analysis revealed a shift from general key words (e.g., "risk factors," "outcome") used between 2008 and 2013 to more specific key words (e.g., "quality of life," "dental implants") from 2014 to 2020. This shift likely reflects the evolving focus of the journal in response to global and national trends in medical research. For instance, the increased use of "air pollution" as a key word after 2014 aligns with Serbia's national efforts to address air quality issues and public awareness

campaigns [13]. The collaboration network analysis demonstrated the interconnectedness of the leading authors, with significant clustering around a few key individuals, such as Jovanović Milan and Lazić Zoran. This suggests a strong collaborative culture within the journal, which may contribute to its influence in the field.

While this bibliometric analysis provides valuable insights into VSP, the method has inherent limitations. The limitation of the study was that the analysis was restricted to articles indexed only in the WoSCC, potentially excluding relevant papers not captured by this database [14]. Despite this limitation, using a reputable and widely recognized database like the WoSCC ensures that the results represent the impact of the journal in the broader scientific community.

Conclusion

This bibliometric analysis offers a detailed overview of the most cited articles in *Vojnosanitetski pregled*, highlighting key contributors, evolving research trends, and the impact of the journal on the medical field. Further studies could expand on this work by incorporating additional databases and exploring the relationship between bibliometric indicators and the journal's influence over time. Future research could explore the evolving role of collaborative networks in enhancing the visibility and impact of research published in the journal, particularly in emerging fields of study. The findings underscore the importance of collaboration and targeted research in advancing both clinical practice and academic knowledge.

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