

Research Trends of Acupressure Applications in Surgical Nursing: A Bibliometric Analysis

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Abstract

Aim: This study intended to investigate the main research topics, evolving themes, and the development of research on acupressure applications within the domain of surgical nursing.

Method: The study included 97 articles sourced from the Web of Science database, all of which met the inclusion criteria and focused on acupressure applications in surgical nursing. Data analysis was carried out using the Bibliometrix package in the R programming environment.

Results: The findings revealed that research on acupressure in surgical nursing was conducted in 10 different countries with contributions from 411 researchers affiliated with more than 40 institutions. The earliest publication in this field was from 2002, with a significant increase in publications noted in 2021 and 2023. Yeh M.L. was recognized as the most productive author, while China, Iran, and the United States were the primary contributors to research output. The Chinese Medical University was identified as the institution with the highest activity.

Conclusion: The results highlight thematic gaps in the literature, identify prominent but under-explored areas, categorize keyword clusters, and map research collaborations. These insights also point to future research opportunities in the field of acupressure applied to surgery in nursing.

Keywords: Acupressure, bibliometric analysis, nursing, surgery.

Hemşirelik Alanında Cerrahide Akupresür Uygulamalarına İlişkin Araştırma Eğilimlerinin Bibliyometrik Bir Analizi

Öz

Amaç: Bu çalışma, hemşirelik alanında cerrahide akupresür uygulamalarına üzerine yapılan araştırmaların çalışma odağını, tematik eğilimleri ve gelişimini analiz etmek amacıyla yapıldı.

Yöntem: Çalışmanın evrenini Web of Science veritabanında araştırmanın dahil edilme kriterlerine uyan hemşirelik alanında cerrahide akupresür uygulamalarına üzerine yapılan 97 makale oluşturdu. Verilerin analizi R yazılımında Bibliometrix Paket programı kullanılarak gerçekleştirildi.

Bulgular: Cerrahi hemşirelik kapsamında akupresür uygulamalarına yönelik çalışmaların, 10 farklı ülkeden toplam 411 araştırmacı ve 40'tan fazla kurumun katkısıyla gerçekleştirildiği belirlenmiştir. İlk

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yayının 2002 yılında yayımlandığı saptanmış, yayın yoğunluğunun ise 2021 ve 2023 yıllarında zirveye ulaştığı görülmüştür. Alanda en fazla yayını bulunan yazar Yeh M.L. olurken, en üretken ülkeler Çin, İran ve Amerika Birleşik Devletleri olarak öne çıkmıştır; en aktif kurumun ise China Medical University olduğu tespit edilmiştir.

Sonuç: Elde edilen bulgular, hemşirelikte cerrahide uygulanan akupresür uygulamalarıyla ilgili literatürde mevcut tematik boşlukları, öne çıkan ve yeterince çalışılmamış alanları, anahtar kelime gruplarını, uluslararası araştırma iş birliklerini ve geleceğe dönük potansiyel araştırma fırsatlarını ortaya koymaktadır.

Anahtar Sözcükler: Akupresür, bibliyometrik analiz, hemşirelik, cerrahi.

Introduction

Around the world, traditional and complementary medicine practices are widely utilized, and in our country, they have become recognized for their safety and effectiveness in health promotion¹. These practices are employed in a variety of clinical settings, including pain management, anxiety reduction, and the enhancement of overall comfort, which positions them as an important aspect of holistic healthcare and nursing^{2,3}. In this context, acupressure has emerged as an effective treatment option that stands out as an alternative to invasive methods⁴.

Acupressure is a massage technique that involves applying pressure to specific areas of the body using the thumb or index finger, palm, hands, or a stimulating device. This technique is thought to regulate the flow of energy, help maintain homeostasis, and stimulates the body's natural healing processes^{5,6}. Acupressure is currently used by nurses in surgical clinics and is defined as a nursing intervention within the Nursing Interventions Classification (NIC)⁷. In surgical settings, this method has been reported to reduce pain, promote relaxation and comfort, prevent nausea and vomiting, and improve postoperative outcomes⁸⁻¹⁰. As a non-invasive alternative, acupressure is becoming a safer option compared to acupuncture, as it avoids adverse reactions associated with needling such as pain, bleeding, or inflammation¹¹. In recent years, acupressure has been receiving increasing attention due to its low cost, minimal side effects, and user-friendly approach⁴.

Previous studies have demonstrated the effectiveness of acupressure in various surgical populations, including reductions in postoperative pain following thoracoscopic surgery¹², decreased pain and psychological stress after perianal abscess surgery¹³, improved bowel function after coronary artery bypass graft surgery¹⁴, and enhanced sleep quality and anxiety in cardiac surgery patients¹⁵. The use of acupressure in surgical clinics and related research is steadily increasing due to its simplicity, cost-effectiveness, and non-invasive nature^{7,10}. As acupressure gains popularity, it is crucial to systematically evaluate its dissemination and impact⁴. Bibliometrics is widely used by researchers from various disciplines to improve access to knowledge and to gain deeper insight into the structure of scientific information. This analytical approach enables the systematic mapping of the development of a research field, the identification of its core knowledge sources, the detection of emerging research trends, and the evaluation of

research outputs in terms of productivity, funding, impact, and geographical distribution¹⁶. Although bibliometric analysis studies on acupressure exist in the literature⁴, no bibliometric study focusing specifically on this topic within the field of surgical nursing has been identified. Therefore, this study aims to fill this gap and provide evidence-based direction for future research, ultimately contributing to the improvement of nursing practices.

Material and Methods

Study Design

Bibliometric analysis and science mapping methods were used in this study. This study is presented in accordance with the methodological and reporting principles recommended by the EQUATOR network for bibliometric studies¹⁷.

Study Questions

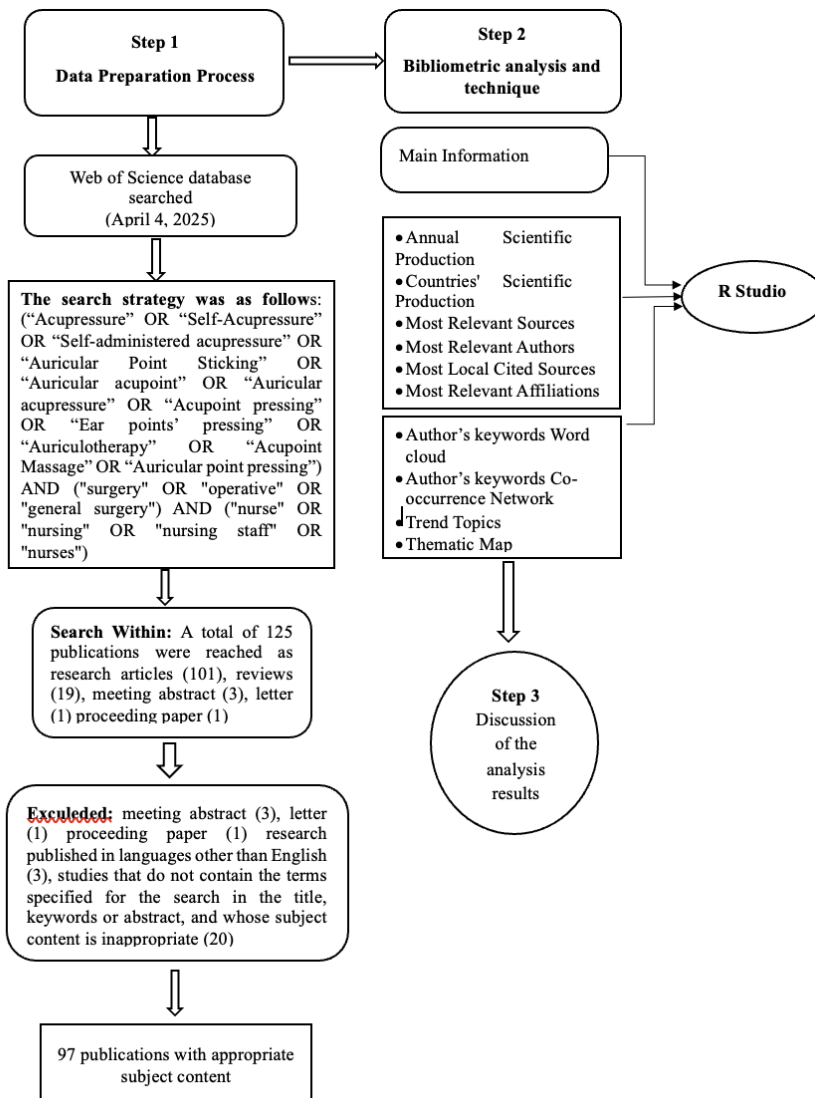
- What are the annual citation and publication counts?
- What does the co-occurrence map of author keywords related to the topic reveal?
- Which journals, authors, institutions, and countries have published the most on the topic?
- Which studies have received the highest number of citations on the topic?
- What is the thematic map of keywords used in studies related to the topic?

Data Collection

The research data were obtained from the Web of Science (WoS) database on April 4, 2025. This database was preferred due to its comprehensive publication and citation history, as well as its effective access to bibliographic data¹⁸. The search strategy applied in this study was outlined as follows: [TI = (“Acupressure” OR “Self-applied acupressure” OR “Autonomous acupressure” OR “Auricular point stimulation” OR “Auricular acupoint pressure” OR “Auricular acupressure” OR “Pressure at acupoint” OR “Ear point pressure” OR “Auriculotherapy” OR “Acupoint massage” OR “Auricular point stimulation”) AND (“surgery” OR “operative” OR “general surgery”) AND (“nurse” OR “nursing” OR “nursing staff” OR “nurses”)]. This strategy was used to scan publications from 2002 to 2025, leading to the identification of 125 relevant articles. The inclusion criteria were defined as "article" and "review article" for the type of publication, and English as the language of publication. Conversely, the exclusion criteria included studies published in languages other than English and publications categorized as "meeting abstract," "letter," and "proceeding paper". No restrictions were applied regarding WoS indexes or publication year during the search process. A total of 97 studies that met the

inclusion criteria were included in the analysis. The data were evaluated independently by two researchers, and a final joint decision was made on which studies would be included in the analysis. Details of the search process are presented in Figure 1.

Figure 1. Research methodology



Statistical Analysis

The data analysis was carried out using the "biblioshiny" application, which is part of the Bibliometrix R package.

Ethical Statement

Since this study did not involve human or animal participants and all data were sourced from publicly accessible databases, ethical approval was not required.

Results

Distribution and Key Indicators of the Publications

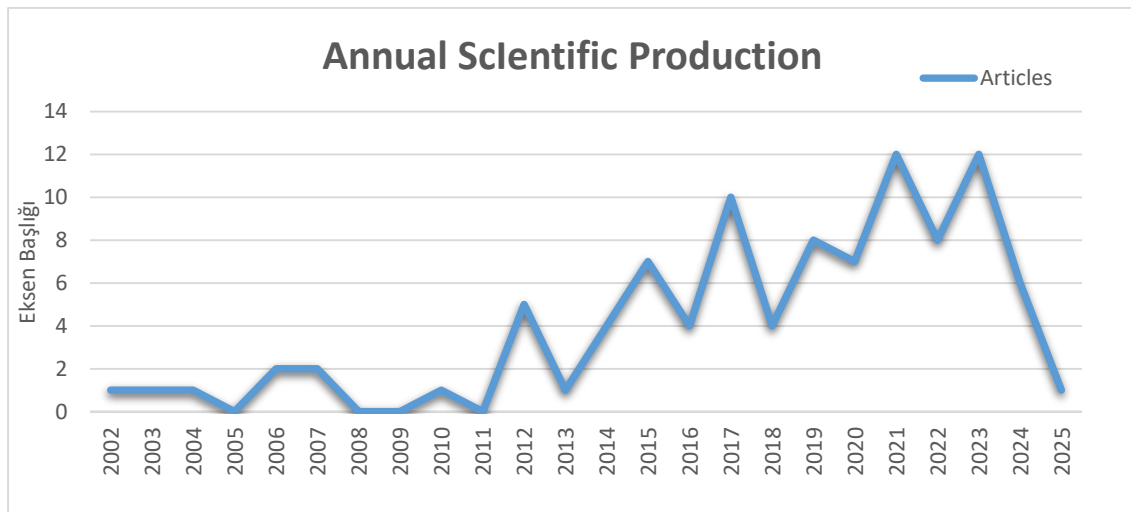
Figure 2 presents the findings obtained from the bibliometric analysis of 97 articles focusing on acupuncture in surgery in the field of nursing in the WoS database between 2002 and 2025. The analysis revealed that all the reviewed studies were in the form of journal articles (n=97), with an average of 6.96 articles published per year. Each of these articles received an average of 14.01 citations, and a total of 3,229 references were cited across the studies. Researchers used 250 different keywords in these publications, and a total of 411 authors contributed to the works. It was determined that there were no single-author articles in this field, and the average number of co-authors per publication was calculated as 4.81. Additionally, 11.34% of the studies featured international co-authorship (Figure 2).

Figure 2. Main information



Based on the search strategies employed, the first publication in this field was identified in 2002 (n=1), while the years 2021 and 2023 saw the greatest number of publications, with 12 in each year (Figure 3).

Figure 3. Annual scientific production

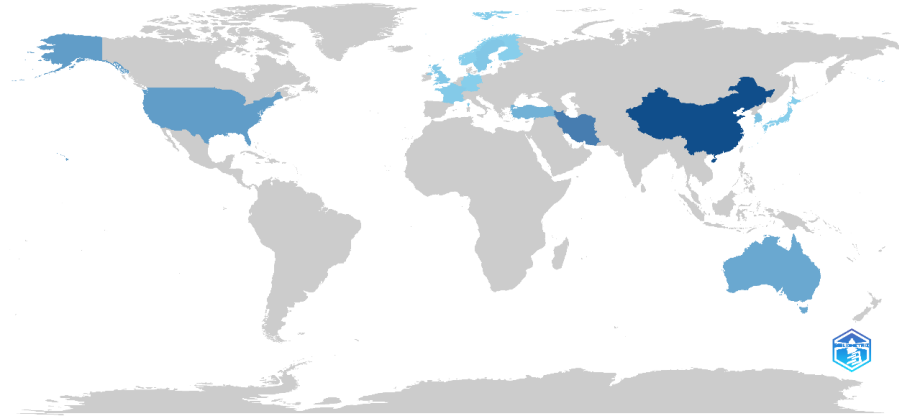


Global Analysis of Publications

Figure 4 illustrates the worldwide distribution of publications on the use of acupressure in surgical nursing. Regions with the highest number of publications are shown in darker shades, while areas where the topic has been less explored appear in light blue. Countries marked in grey indicate that the subject has not yet been addressed there. When examining the distribution of publications by country, it is observed that the highest number of publications originated from China (freq=170), Iran (freq=104), the United States of America (USA) (freq=62), Australia (freq=48), Türkiye (freq=37), South Korea (freq=15), Sweden (freq=9), the United Kingdom (UK) (freq=8), France (freq=6), and Singapore (freq=5). Additionally, no publications have been produced in the grey-marked regions (Figure 4).

Figure 4. Country scientific production

Country Scientific Production



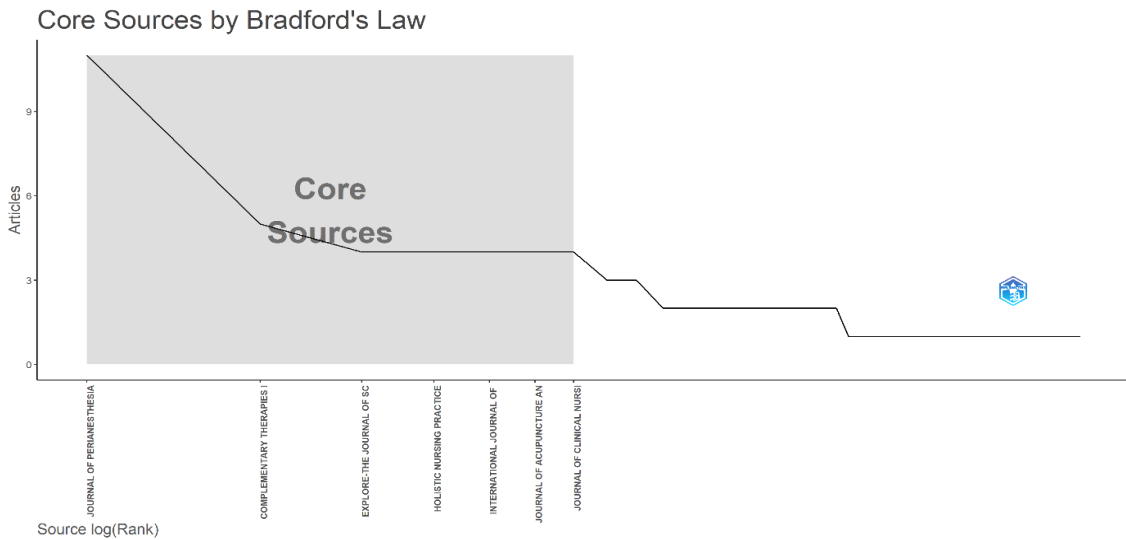
Top 5 Authors, Countries, Institutions and Journals that Contributed the Most to Field

According to Table 1, Yeh M.L. (n = 5) was the most prolific author, and, China (n = 170) ranked first in publication output. China Medical University (n = 20) was the most productive institution. Furthermore, Bradford's Law analysis identified the Journal of Perianesthesia Nursing as the core source in the field (n = 11) (Table 1, Figure 5).

Table 1. Top 5 authors, countries, institutions, and journals contributing the most to the field

Number	Author	Author-Number of Article	Country	Country-Number of Article	Affiliation	Affiliation - Number of Articles	Journals	Journal-Number of Article
1.	Yeh M.L.	5	China	170	China Med University	20	Journal of Perianesthesia Nursing	11
2.	Abadi F.	4	Iran	104	Hamadan University Medical Science	12	Complementary Therapies In Medicine	5
3.	Chen C.P.	4	USA	62	Griffith University	10	Explore-The Journal Of Science And Healing	4
4.	Liu Y.	4	Australia	48	Shiraz University Medical Science	10	Holistic Nursing Practice	4
5.	Chen H.H.	3	Türkiye	37	Mashhad University Medical Science	9	International Journal of Nursing Studies	4

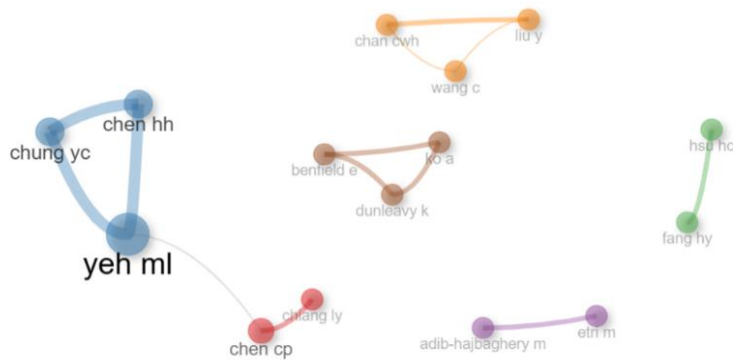
Figure 5. Bradford's Law



Co-authorship Network Map Demonstrating Collaboration between Authors

Figure 6 presents the author collaboration network analysis. The analysis is based on a total of 20 nodes, each representing a single author. The lines connecting the nodes indicate collaborative relationships between authors, with the thickness of the lines corresponding to the intensity of collaboration. In this literature review on acupressure in surgical nursing practices, six distinct clusters have been identified. The cluster represented in red occupies a central position within the network, with the author 'Yeh M.L.' playing a pivotal role in inter-author collaboration. Another author within the same cluster, 'Chen P.', maintains a direct collaborative link with 'Yeh M.L.' and constitutes a significant component of intra-cluster connectivity. In contrast, the brown, orange, purple, and green clusters demonstrate lower collaboration intensity, and there is no observed inter-cluster collaboration among the authors within these groups (Figure 6).

Figure 6. Co-authorship network map showing inter-author collaboration



Top 10 Most Local Cited Articles

Table 2 lists the top 10 most local cited articles. The article titled “The efficacy of acupressure to prevent nausea and vomiting in post-operative patients” by Ming J.L. et al., published in 2002 in the Journal of Advanced Nursing, is identified as the most cited publication (Table 2).

Table 2. Top 10 most local cited articles

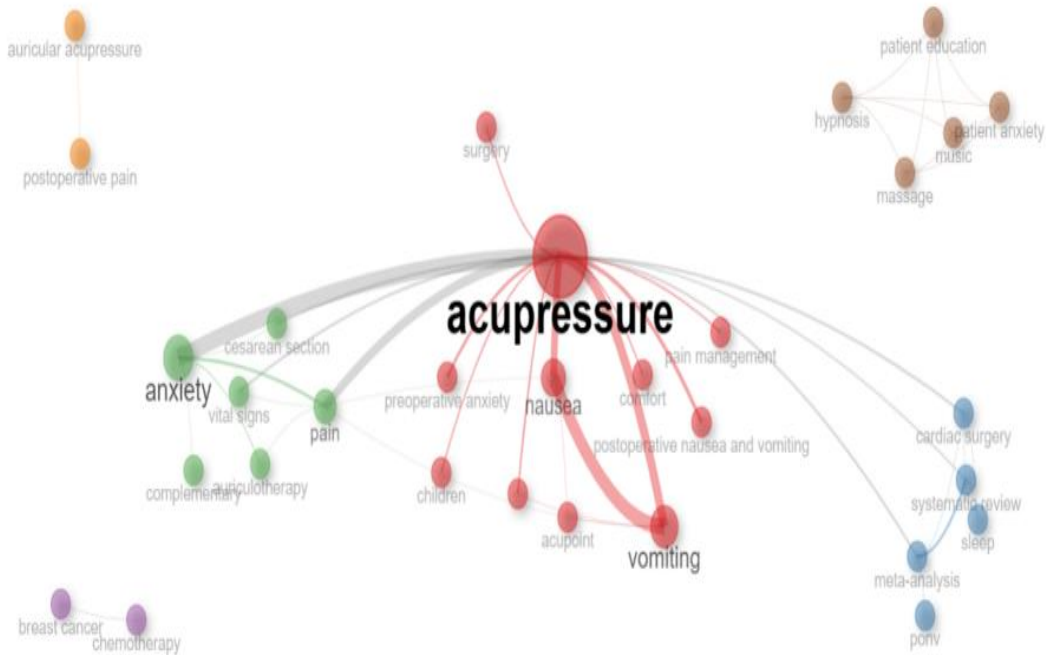
Author	Journal	Article name	Citation
Ming et al., 2002 ¹⁹	Journal of Advanced Nursing	The efficacy of acupressure to prevent nausea and vomiting in post-operative patients	6
Yılmaz Şahin et al., 2018 ²⁰	International Journal of Nursing Studies	Effect of acupressure application to the P6 acupoint before laparoscopic cholecystectomy on postoperative nausea-vomiting: A randomized controlled clinical study	6

Zhong et al., 2019 ²¹	Chinese Journal of Integrative Medicine	Effectiveness of Auricular Acupressure for Acute Postoperative Pain after Surgery: A Systematic Review and Meta-Analysis	6
Cooke et al., 2015 ²²	Complementary Therapies in Medicine	Wrist acupressure for post-operative nausea and vomiting (WrAP): A pilot study	5
Shin et al., 2004 ²³	Cancer Nursing	Effect of Acupressure on Nausea and Vomiting During Chemotherapy Cycle for Korean Postoperative Stomach Cancer Patients	4
Holmer Petterson, et al 2012 ²⁴	Journal of Clinical Nursing	Acupuncture prior to surgery to minimise postoperative nausea and vomiting: a systematic review	4
Adib-Hajbaghery, et al. 2013 ²⁵	Journal of Research Medicine	Effect of acupressure of Ex-Le7 point on pain, nausea and vomiting after appendectomy: A randomized trial	4
Chung et al., 2014 ²⁶	International Journal of Nursing Studies	Integrative acupoint stimulation to alleviate postoperative pain and morphine-related side effects: A sham-controlled study	4
Hsiung et al., 2015 ²⁷	Complementary Therapies in Medicine	Acupressure improves the postoperative comfort of gastric cancer patients: A randomised controlled trial	4
Kwon et al., 2016 ²⁸	Cancer Nursing	Effects of Nei-Guan (P6) Acupressure Wristband On Nausea, Vomiting, and Retching in Women After Thyroidectomy	4

Co-Author Occurrence

Figure 7 illustrates the application of the network analysis method based on author keywords, with studies on acupressure in surgery within nursing categorized into six clusters. This method highlights the rate at which keywords co-occur. The red cluster highlights the keywords with the highest frequency of use, whereas the green and blue clusters depict other frequently occurring terms. Within the red cluster, the keywords “acupressure,” “vomiting,” “nausea,” “postoperative nausea and vomiting,” and “preoperative anxiety” are particularly prominent in terms of usage frequency (Figure 7).

Figure 7. Co- occurrence Network



Word Cloud, Thematic Map and Trend Topic Analysis

Figure 8 displays the word cloud of the most commonly used keywords related to the topic. The cloud expands as the frequency of word usage increases. The most frequently used author keywords were acupressure (n=39), anxiety (n=18), vomiting (n=14), nausea (n=11), pain (n=11) and postoperative nausea vomiting (n=11) and meta-analysis (n=11) (Figure 8).

Figure 8. Word cloud



Figure 9 shows 16 years of trending topics related to acupressure applied in surgery in the nursing field. A minimum word frequency of 3 and an annual word count of 5 were

considered. The most frequent topics were found to be “acupressure”, “anxiety”, “vomiting”, ‘nausea’, “postoperative nausea vomiting” and “pain”. As of early 2015, the most popular topics were “nausea”, “vomiting”, and “postoperative nausea vomiting”, while in recent years the most popular topics were “auriculotherapy”, ‘pain’, “randomized control trials” and “postoperative pain” (Figure 9).

Figure 9. Trend topics

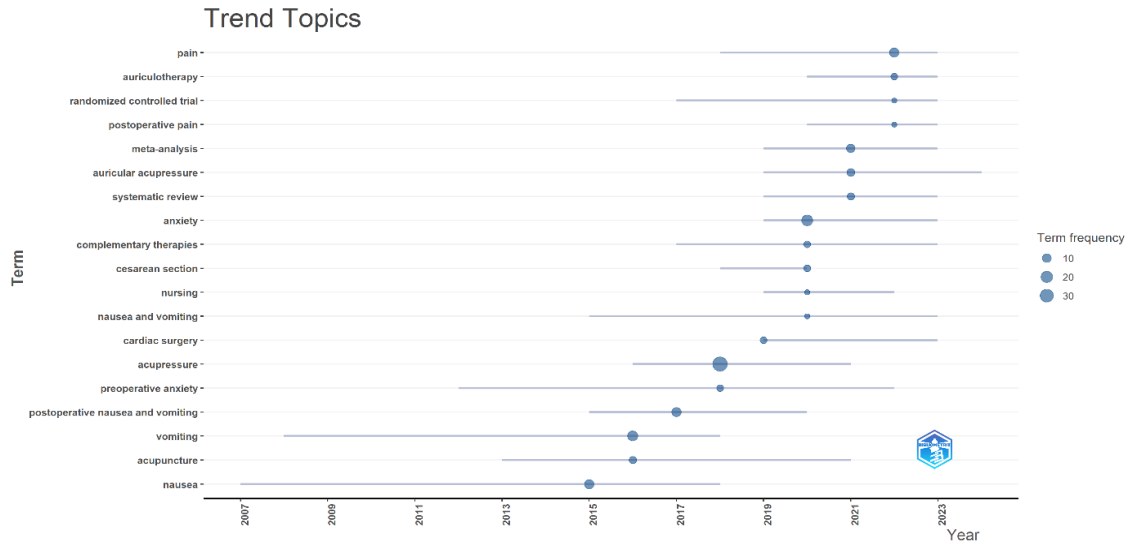
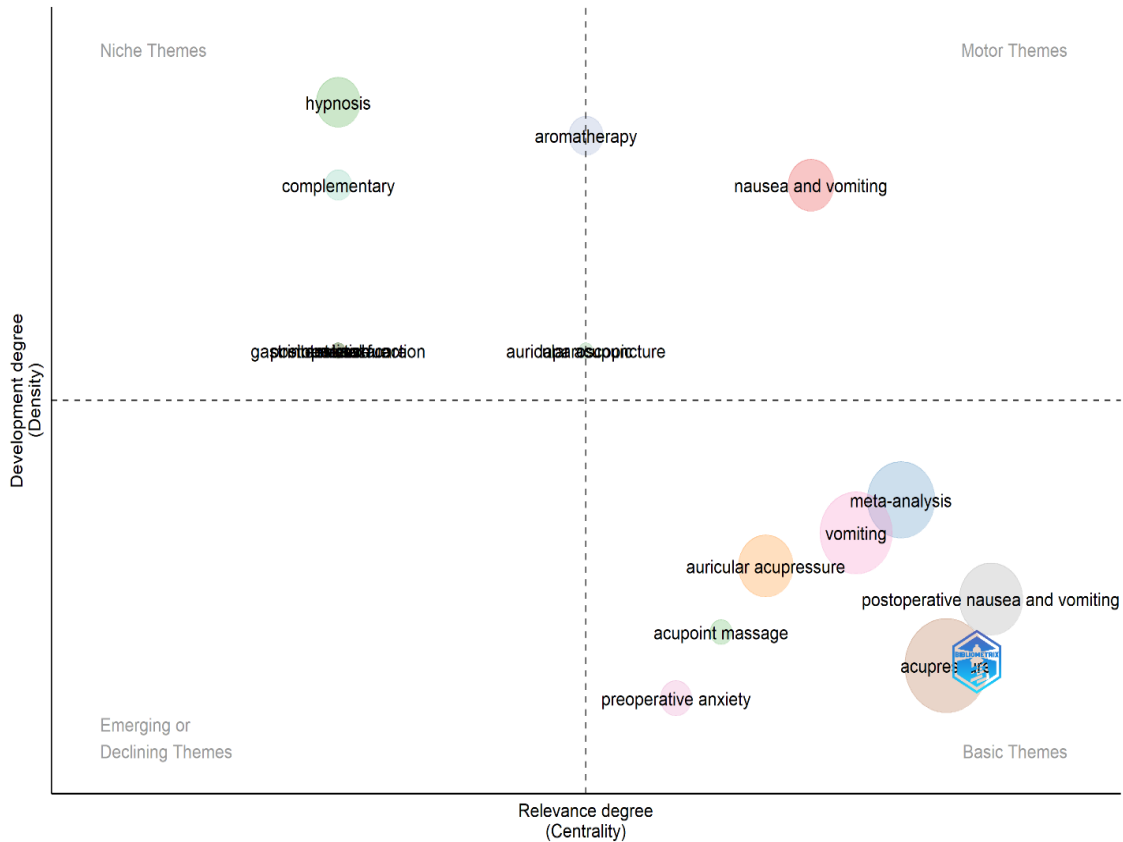


Figure 10 presents a thematic map of the studies on acupressure in surgery in the field of nursing. In this analysis, 250 keywords were considered, the minimum clustering reference value was set to 5, and only one level was used for each cluster level. The upper right quadrant of the map shows “motor themes” defined by high centrality and density, and the keywords “nausea and vomiting” are prominent in this region. The upper left quadrant contains themes defined by low centrality but high intensity, which are mostly niche areas; the terms “hypnosis”, “aromatherapy”, “complementary”, “gastrointestinal function” and “auricular acupuncture” appear in this quadrant, and these words are associated with limited external links to the study topic. The lower left quadrant contains themes that are low in both centrality and intensity and therefore have limited impact in the field. Although the word “stress” appears here, it does not appear in the thematic map. The lower right quadrant contains the main themes with high centrality but low intensity, and the keywords that stand out here are “preoperative anxiety”, acupoint massage”, “auricular acupressure”, “vomiting”, “postoperative nausea and vomiting”, “meta-analysis” and “acupressure”. This shows that the theme is central but still has room for improvement in terms of research (Figure 10).

Figure 10. Thematic map

Discussion

Many researchers from various disciplines use bibliometric analysis to gain deeper insights into the structure of knowledge. This analytical method offers an opportunity to map the development of a field, identify key information sources used within the domain, and uncover emerging trends in the research landscape. It sheds light on how scientific, evidence-based information and studies are utilized¹⁶. Bibliometrics utilizes statistical methods, such as citation and content analysis, to gain a more comprehensive understanding of the usage and impact of publications within a particular field²⁹. This bibliometric and visualized analysis examines nursing research on acupressure applications in surgical processes, revealing trends in the nursing discipline related to acupressure and identifying knowledge gaps in this area. It provides a roadmap that will guide future nursing research efforts. When we examine the nursing literature, to the best of our knowledge, no bibliometric study has specifically focused on acupressure applications within the field of surgical nursing. In this study, by accessing the WoS database, scientific collaboration networks among authors, institutions, and sources were visualized based on publications and citations in the literature. The findings obtained are of great importance for nurses who provide care and perform acupressure for patients undergoing surgical interventions. Especially, the potential effects of acupressure on reducing pain levels and postoperative nausea and vomiting in surgical

patients enable the adoption of holistic and patient comfort-oriented approaches in nursing care³⁰. This is of great importance in supporting the recovery process and improving both care and quality of life. Therefore, this study offers significant contributions to the literature by addressing the role and impact of acupressure in nursing practices from a bibliometric perspective and facilitates the strengthening of holistic care approaches in nursing science.

Based on the findings of a bibliometric analysis of 97 articles focused on acupressure in surgery published in the Web of Science (WoS) database between 2002 and 2025, a total of 411 authors contributed to the field. An examination of annual scientific output revealed that the first publication emerged in 2002, with no prior literature identified until that year. However, a significant increase in publications was observed thereafter. The highest number of publications occurred in 2021 and 2023 (n=12). In line with these findings, it has been determined that interdisciplinary studies on acupressure, particularly in fields such as nursing, physiotherapy, and pain management, have become more prevalent and that bibliometric analyses on the topic are included in current literature^{30,31}.

The increase in the number of contributing authors suggests a growing research interest in the area and indicates the adoption of an interdisciplinary approach, as experts from diverse research fields have collaborated. A review of the publication and citation trends reveals a growing number of nursing studies on acupressure in the surgical field, although the quantity remains below desirable levels. When examining publications related to acupressure in surgical contexts, China ranks first in terms of output. Notably, Iran and the United States also show a considerable number of publications. China's leadership in this area may be attributed to the diversity of its research centers and the emphasis on the topic at scientific gatherings. Additionally, the integration of modern biomedical treatments with traditional practices is supported in China³². The most locally cited article on acupressure in surgery was conducted in Taiwan by Ming J.L. et al., titled "The efficacy of acupressure to prevent nausea and vomiting in postoperative patients"¹⁹.

Bradford's Law was used to determine the most productive journals in the nursing literature on surgical acupressure. This law examines how scientific literature is distributed across different journals³³. Based on this law, the Journal of Perianesthesia Nursing was identified as the leading journal in this field. This journal provides updated knowledge in critical areas of surgical nursing, such as postoperative pain management, anxiety, and the prevention of postoperative nausea and vomiting³⁴. Given that acupressure is often studied in relation to these complications, the abundance of such publications in this journal is to be expected.

In terms of individual scholarly productivity, Yeh M.L. was identified as the most prolific author in surgical acupressure within the nursing field and also demonstrated the highest level of collaboration. However, it was observed that overall collaboration among authors remains limited. Collaborations between researchers foster the exchange of knowledge, ideas, and resources, thereby promoting innovation and enhancing research

productivity^{35,36}. Therefore, scholars seeking up-to-date and comprehensive knowledge or aiming to establish collaborations are encouraged to follow the works of these prolific authors.

Among the top ten institutions producing the most publications in this area, five are based in Iran, four in China, and one in Australia. It is recommended that multinational or multicenter studies be conducted with large sample groups and collaborative efforts across countries and institutions in order to strengthen the evidence base in healthcare^{37,38}. Researchers interested in conducting international studies on surgical acupressure in nursing are advised to collaborate with these leading institutions.

Keywords play a critical role in reflecting the central concepts of a study and provide insight into its content. Analysis of the keyword network revealed frequent use of terms such as acupressure, anxiety, vomiting, nausea, pain, postoperative nausea and vomiting, and meta-analysis. Similarly, in a bibliometric analysis that examined acupressure research trends from 2004 to 2024, the most frequently used keywords included acupuncture, management, pain, auricular acupressure, and quality of life⁴. These findings provide an understanding of trends within the field. Less frequent keywords such as acupoint, aromatherapy, and auricular acupuncture suggest that research on these topics in surgical acupressure remains limited. Researchers are therefore encouraged to address these gaps and contribute to the nursing literature. In the thematic map, the keywords nausea and vomiting, characterized by high centrality and density, emerged as prominent themes. Acupressure involves manual stimulation of specific acupuncture points on the body. One such point, Pericardium 6 (P6), has been reported to be effective in alleviating nausea and vomiting. Stimulation of this point is thought to reduce nausea through its influence on gastric motility and the central nervous system³⁹. Numerous randomized controlled trials have demonstrated that acupressure applied to the P6 point is significantly effective in reducing postoperative nausea and vomiting (PONV)^{39,40}. A meta-analysis by Lee et al. (2015) confirmed that acupressure at the P6 point significantly reduces the incidence of PONV³⁹. Similarly, in a meta-analysis evaluating the impact of acupressure on PONV in patients undergoing laparoscopic surgery, Salamah (2023) highlighted that acupressure significantly reduces nausea and vomiting in both early and late postoperative periods⁴⁰. These findings suggest that acupressure holds therapeutic potential for managing these symptoms and is increasingly being integrated into clinical nursing practice as a complementary method.

Although niche themes offer valuable contributions by providing in-depth analysis within specific disciplines or specialties, they often garner less attention than broader and more popular topics⁴¹. Terms such as hypnosis, aromatherapy, complementary, gastrointestinal function, and auricular acupuncture were identified in this study. While the keyword stress appeared in the cluster analysis, it did not feature on the thematic map. This may be due to its failure to meet threshold values for density and centrality or the lack of strong conceptual associations in the literature. Furthermore, thematic maps tend to highlight dominant and well-developed themes, which may lead to the

underrepresentation of secondary or marginal keywords. This suggests that the theme of stress is still in an emerging stage or has only been explored in limited contexts.

Conclusion

In conclusion, although the highest number of publications on acupuncture in surgical nursing occurred in 2021 and 2023, the overall publication volume remains suboptimal. Furthermore, collaboration within the field appears insufficient. The analysis of keywords demonstrates a focus on the management of symptoms such as nausea and vomiting, yet complementary themes such as aromatherapy, auricular acupuncture, gastrointestinal functions, and stress remain underrepresented in the literature. This indicates a need for further research in these areas. It is essential for nurses to explore these niche topics to fill existing gaps and enhance the role of complementary methods in clinical practice. Additionally, researchers are advised to establish multicenter collaborations, particularly with prolific authors and institutions in China and Iran, to advance research in this field.

Strength and Limitations

This study has both strengths and limitations. One of its strengths is that, to the best of our knowledge, it represents the first bibliometric analysis focusing specifically on surgical acupuncture within the nursing field. However, there are some limitations. All the articles used in the analysis were sourced exclusively from the Web of Science (WoS) database, meaning that significant studies from other databases or those published in different languages may have been overlooked. This could introduce a degree of bias in the findings. Additionally, since the data for this study were collected on April 4, 2025, time constraints may affect the validity and currency of the results.

Author Contribution Area and Rate: The authors contributed equally to this study.

Ethics Committee Approval: This study does not require ethical committee approval.

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Conflicts of Interest: The authors declare that there is no conflict of interest with any individual or institution in the context of this study.

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