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## A Bibliometric Analysis of Nurse Workforce Shortages in the Western Pacific Region

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### ABSTRACT

**Background:** The nursing workforce crisis has emerged as a critical challenge across the Western Pacific Region (WPRO), impacting both healthcare quality and access. This study presents a comprehensive bibliometric analysis of the workforce trends and key themes related to nursing shortages in the WPRO.

**Methods:** A systematic language search was conducted using the Scopus database. Drawing on 319 articles indexed in Scopus between 2016 and 2025, the analysis employed VOS viewer and the Bibliometrix R-package to identify the key research trends, influential authors, and intellectual and conceptual structures in the literature.

**Results:** Themes emerged: current trends, nursing shortages, factors contributing to workforce shortages, ensuing challenges, and strategies to remediate nursing shortages. Keyword analysis revealed system-level issues, including inadequate workforce planning, suboptimal working conditions, and limited nursing education capacity. Policy interventions, such as workforce redistribution, investment in education, and improvements in working conditions, are discussed as viable strategies.

**Conclusion:** This study provides a comprehensive knowledge base for researchers and policymakers developing sustainable solutions to nursing workforce challenges in the Western Pacific Region.

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**Keywords:** Nurses; Shortages; Western Pacific region; Workforce crisis

## INTRODUCTION

The global nursing workforce shortage remains a critical challenge for health systems worldwide, with a persistent deficit of 5.8 million nurses despite an expansion in the workforce from 27.9 million nurses in 2018 to 29.8 million in 2023, as documented by the World Health Organization (1). This shortage is further exacerbated by high global turnover rates of 15.2% and intention-to-leave rates reaching 38.4%, underscoring the persistent and debilitating nature of the nursing crisis that continues to strain healthcare delivery globally (1). The nursing workforce in the Western Pacific Region (WPRO) is experiencing a critical and sustained shortage, threatening the delivery of quality healthcare services across both developed and developing nations in the region (2,3). Countries such as China (4), Australia (5), South Korea (6), and Japan (7) are those primarily affected by this crisis. Nations like Fiji (8), Cambodia (9), Mongolia (10,11), and Malaysia (12) face challenges in workforce distribution and resource limitations. Australia is expected to face a nursing shortage crisis by the end of 2035, which will affect healthcare costs, patient outcomes, and the organizational ability to retain nurses (13). In Japan, many nurses are recruited from Indonesia to cover the lack of such staff (14). The workforce issue is multifaceted, driven by high turnover rates, low retention (14), job dissatisfaction, migration, burnout (15), an ageing workforce, and inadequate policy support.

The existing literature reveals that the nursing shortage problem is not confined to staffing numbers; it also reflects deeper structural problems within healthcare systems. Nurses can be overworked, underpaid, and often lacking in career advancement opportunities. For example, Australian nurses were less than satisfied with their pay, benefits, and professional development (13). Many nurses in various countries have been reported to work long weekly hours (more than they intended), which can compromise their health (16). They are willing to work overtime for various reasons, including a need for extra money, failing to complete their work tasks, and not wanting to let their co-workers down (16). Migration from lower-income countries to wealthier ones exacerbates the situation by creating disparities in workforce availability. Meanwhile, family obligations and mental

fatigue, especially among female nurses, have been reported as strong motivators for leaving the profession (17).

Despite an increase in research interest and policy debate, strategies to address workforce gaps are still lacking as nurses continue to demand better treatment regarding their work environment, which would lead to higher retention rates in healthcare systems (18).

To comprehensively understand nurse workforce shortages in the Western Pacific Region, a bibliometric approach was employed in this study. For nursing workforce shortages specifically, bibliometric approaches can assess research capacity and productivity across different regions while systematically analysing publication output without subjectivity. The Western Pacific region constitutes one-quarter of the world's population with diverse health needs, where dialogue on nursing roles is ongoing for healthcare delivery. However, the published literature indicates that more research on nursing workforce shortages originates from Western studies compared to WPRO countries, creating an important rationale for comprehensive regional analysis. These systematic quantitative approaches complement traditional review methods by providing evidence on research output patterns, trends, and knowledge structures that can inform policy and practice decisions. By systematically analysing publication trends, co-authorship networks, and thematic clusters, an integrated overview is provided of the existing research, and areas warranting further exploration are identified. The findings aim to enhance the knowledge and understanding of this critical domain.

## METHODS

A bibliometric analysis was conducted to explore the research trends, associated factors, contributing factors, barriers, and challenges that have arisen from the nursing shortages across the Western Pacific Region, as well as potential solutions to expand the available workforce in the region. The subsequent sections detail the research process and methodology employed.

### Search Strategy

#### *Set the Search Process*

- i. Identify suitable bibliographic databases and develop a precise search query using relevant keywords and Boolean operators.
- ii. Establish clear inclusion and exclusion criteria to narrow the scope of the literature, ensuring the collected data is both comprehensive and directly pertinent to the study's goals.

Bibliometric performance and network analysis were employed as follows:

- i. Performance analysis aimed to identify the most influential authors, journals, and institutions related to nurse workforce shortages in the Western Pacific region;
- ii. Network analysis was undertaken to map co-authorship, co-citation, and keyword co-occurrence networks using VOSviewer and the Bibliometrix R-package about the nursing workforce and worldwide shortage of nurses.

### **Search Keywords**

The database chosen was Scopus (single-database approach) due to its variety of documents and its ease of use, which enabled the materials to be filtered with the necessary focus. Using a single, well-established database like Scopus maintains consistency in the data curation process while avoiding potential redundancies that might arise from merging datasets from multiple sources. Scopus provides well-structured metadata, ensuring uniformity and accuracy in the analysis.

The comprehensive scope and analytical depth of bibliometric investigations are critically contingent upon the judicious and systematic integration of pertinent keywords into the established search strategy. To ensure extensive coverage of research pertaining to nurse workforce shortages in the Western Pacific Region, the following search query was formulated: "nurs\* shortage" OR "shortage of nurse\*" AND "Western Pacific" OR WPRO OR "Australia" OR "China" OR "Japan" OR "Malaysia" OR "Indonesia" OR "Philippines" OR "New Zealand" OR "Vietnam" OR "Singapore" OR "South Korea" OR "Fiji" OR "Papua New Guinea" OR "Cambodia" OR "Mongolia" OR "Brunei" OR "Laos". To ensure geographical specificity and relevance, only countries in the Western Pacific Region were included. The inclusion criteria comprised articles published between 2016 and 2025, limited to nursing-related publications in their

final form and written in English to facilitate a comprehensive understanding. The initial search yielded 414 articles; however, 95 were subsequently excluded due to thematic irrelevance, resulting in a final corpus of 319 articles for analysis. Bibliometric analysis was conducted using the Bibliometrix R-package and VOSviewer. The search methodology and outcomes are summarized in **Figure 1**.

### **Research Questions**

1. What is the intellectual structure of research on nurse workforce shortages in the Western Pacific Region, in terms of key contributors such as prominent authors, influential journals, and leading institutions?
2. What major research themes and intellectual clusters characterize the literature on addressing nurse workforce shortages in the Western Pacific Region, and what gaps exist that could inform future strategies for mitigating this critical issue?

### **Research Objectives**

1. To identify the intellectual structure of the literature concerning nurse workforce shortages in the Western Pacific Region, specifically by pinpointing key contributors such as prominent authors, influential journals, and leading institutions.
2. To analyse the primary research themes and intellectual clusters within this body of literature in order to identify existing research gaps and, subsequently, formulate recommendations for future inquiry to effectively mitigate nurse workforce shortages in the Western Pacific Region.

## **RESULTS**

### **Bibliometric Performance Analysis**

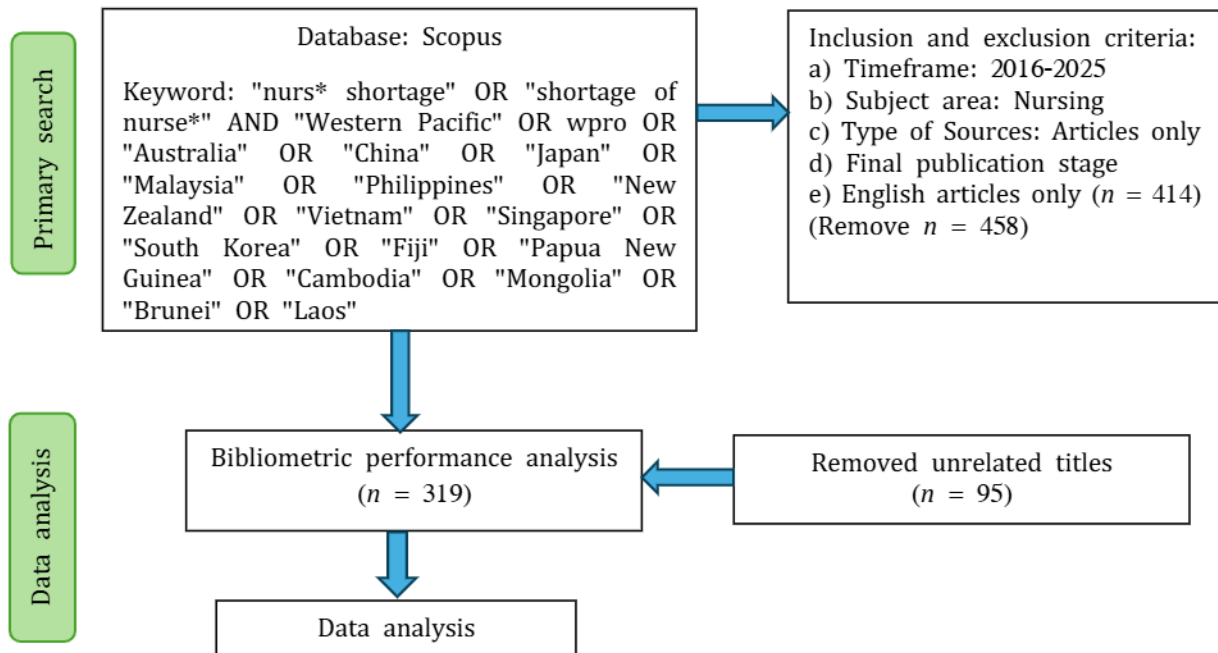
#### **Research and Publication Trends and Patterns Over The Period**

The distribution of research and publications on nurse workforce shortages in the WPRO from 2016 to 2025 is detailed in Figure 2. The research output on these shortages in the region from 2016 to 2025 demonstrates a highly dynamic pattern. Starting with a stable baseline of 22 articles annually (2016-2017), publications saw moderate growth until 2019

(29-30 articles), before a minor dip in 2020 (23 articles). A significant acceleration followed, reaching 37-39 articles in 2021-2022, likely driven by heightened pandemic-era healthcare demands. The peak of research interest occurred in 2024, with an unprecedented 59 articles, highlighting the topic's critical relevance. However, 2025

witnessed a sharp decline to 23 articles, which could suggest research saturation, a shift in academic focus, or incomplete data for that year (at the time of writing). Overall, the trend (**Figure 2**) reflects evolving scholarly priorities and real-world influences on research production.

**Figure 1: Study Flow Chart**



## RESULTS

### Bibliometric Performance Analysis

#### *Research and Publication Trends and Patterns Over the Period*

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shift in academic focus, or incomplete data for that year (at the time of writing). Overall, the trend (**Figure 2**) reflects evolving scholarly priorities and real-world influences on research production.

#### *Geographical Distribution of Publications*

**Figure 3** illustrates the research output of various countries in the Western Pacific Region concerning nursing shortages and the nursing workforce. China is evidently the leading contributor, with 123 published documents, indicating a substantial focus on this research area in that nation. Australia also demonstrates significant research activity, ranking second among the highlighted countries, with 87 documents. Following these, South Korea shows considerable engagement with 42 documents. The broader regional focus reveals a clustering of research activity across Asia and Oceania, with other notable contributions from Japan (25 documents), Malaysia (13 documents), Singapore (13 documents), the Philippines (11 documents), and New Zealand (11 documents),

and Thailand (10 documents). This strong regional engagement suggests that Western Pacific countries are actively investigating issues related to their nursing workforces and shortages.

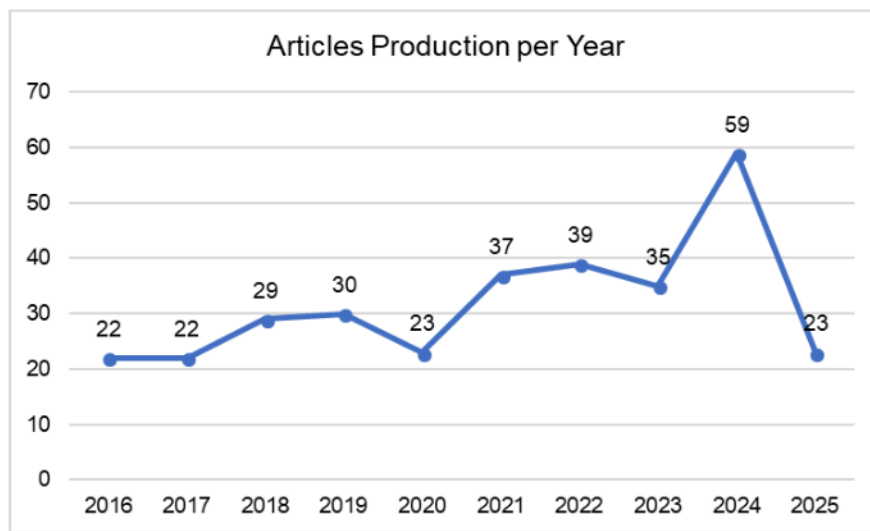
The varying publication numbers imply that while China, Australia, and South Korea may be experiencing or anticipating more pronounced challenges in their nursing sectors, prompting extensive academic inquiry, the other countries mentioned also demonstrate considerable concern for and

engagement in research, albeit on comparatively smaller scales.

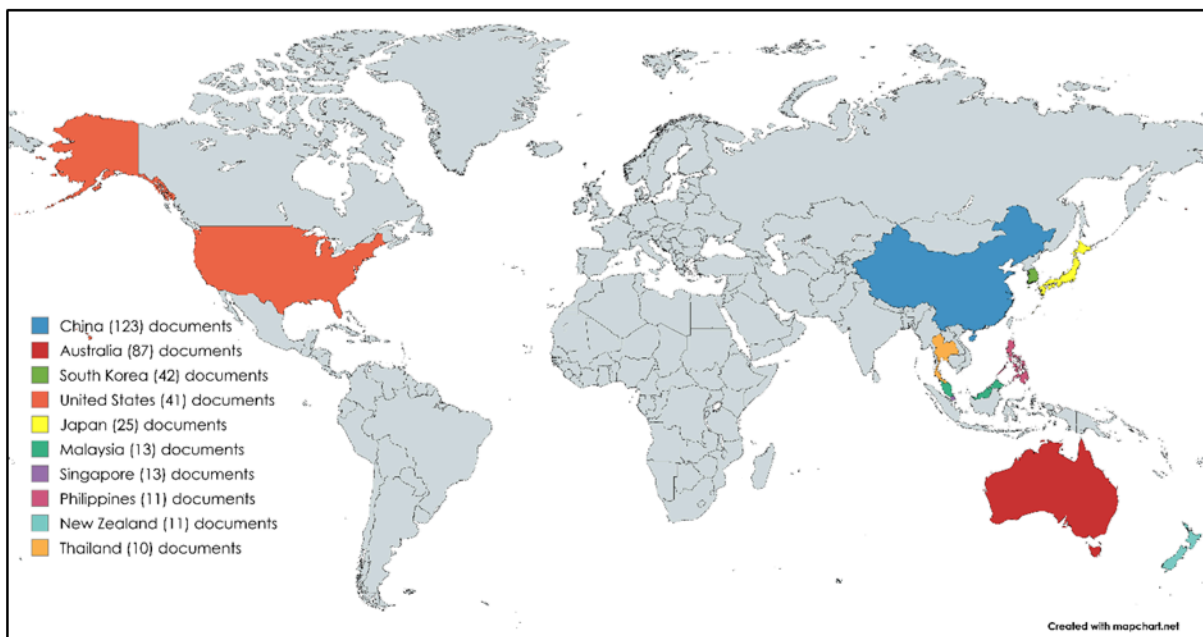
**Most Influential Countries and Publications**

Figures 4 and 5 show the total count of the most cited countries and the average number of article citations, respectively. China has the highest total count in terms of the ten most cited countries; however, the average number of article citations is only 22.3, the fourth highest of these ten countries. Surprisingly, Oman, while fourth highest in total count, has the highest average number of citations.

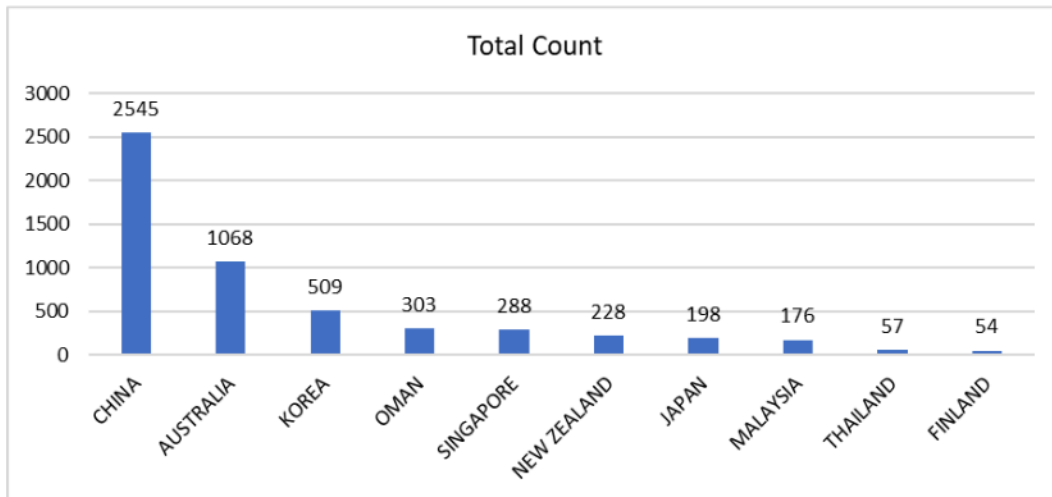
**Figure 2:** Total Articles Production Count Per Year



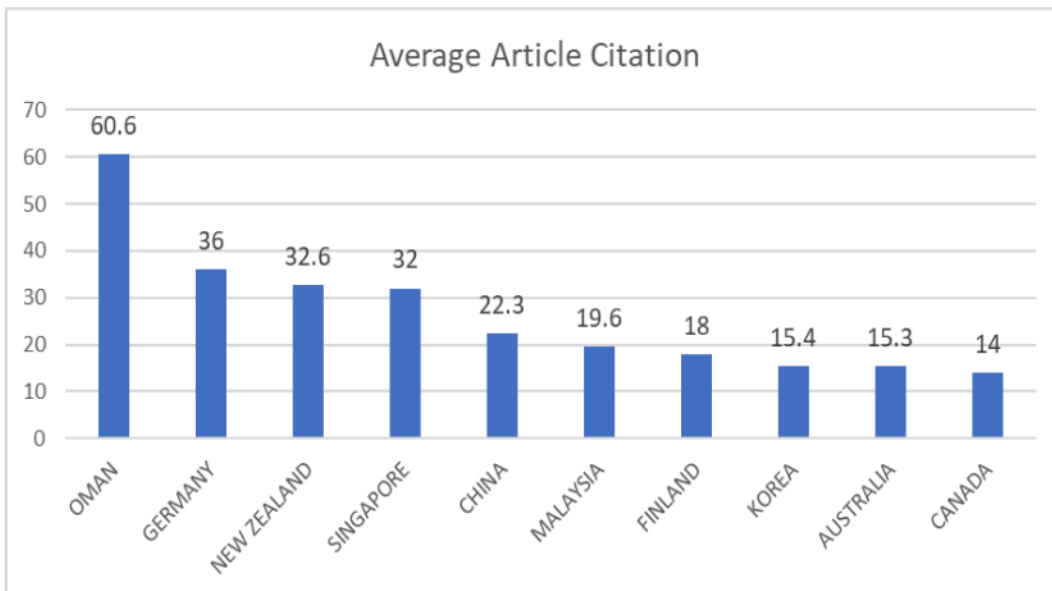
**Figure 3:** Publication of Articles by Country



**Figure 4:** Ten Most Cited Countries Based on Total Count



**Figure 5:** Ten Most Cited Countries Based on Average Article Citations



**Affiliation**

From the perspective of influential institutions, **Figure 6** displays the ten institutions that have produced the most articles related to nursing shortages. Huazhong University of Science and Technology [41] is the highest, followed by Monash University [32] and Chiang Mai University [25].

**Most Influential Journals and Authors**

Based on the analysis, the Journal of Nursing Management is the most active journal on nursing shortages, publishing the highest number of articles. BMC Nursing follows with 28. Both the Journal of Clinical Nursing and

Nurse Education Today have published 20 articles each. Other notable journals include International Nursing Review, Collegian, and the International Journal of Nursing Studies, each contributing over 10 articles. These outcomes show that most research on nursing shortages is published in well-established nursing and healthcare education journals.

**Ten Most Relevant Journals Based on Total Documents**

**Table 1** ranks the leading journals by the number of articles published, providing a clear indication of prominent avenues for nursing research. Overall, this table underscores that research on nursing issues, likely including workforce dynamics and

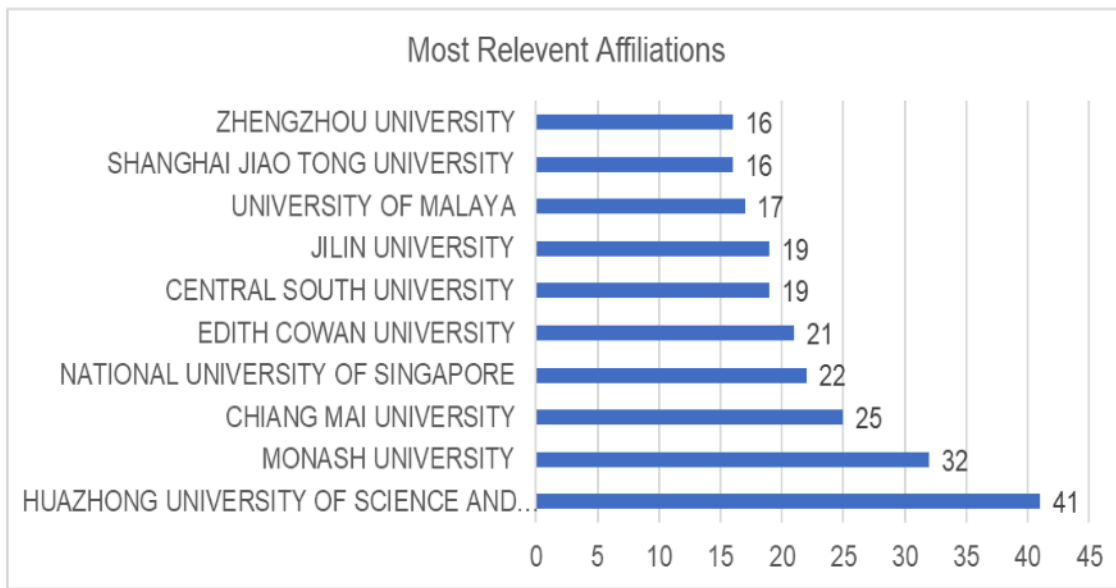
shortages, is heavily concentrated in journals focusing on nursing management, clinical practice, and education, with these publications also having strong international representation.

**Most Influential Articles**

**Table 2** presents the ten most relevant studies, which focus on why nurses leave their jobs and how they can be supported more effectively. Yu et al. (19) examined

burnout, compassion fatigue, and satisfaction among oncology nurses, finding that emotional stress affects how long they remain in the profession. Guo et al. (20) studied burnout and resilience, demonstrating that nurses with greater resilience are less likely to experience burnout. Moloney et al. (21) explored the factors influencing nurses' decisions to leave their jobs or the nursing profession entirely. Their work remains crucial in advancing knowledge and understanding within this area of research.

**Figure 6: Most Influential Institutions**



**Table 1: Most Influential Articles**

Rank	Journal	Articles
1	Journal of Nursing Management	40
2	BMC Nursing	28
3	Journal of Clinical Nursing	20
4	Nurse Education Today	20
5	International Nursing Review	15
6	Collegian	13
7	International Journal of Nursing Studies	13
8	Journal of Advanced Nursing	13
9	Nurse Education in Practice	13
10	Nursing Open	11

Table 2: Most Influential Articles

No	Authors, year	Title	Journal	Total Citations
1.	Yu et al., 2016	Prevalence and predictors of compassion fatigue, burnout and compassion satisfaction among oncology nurses: A cross-sectional survey	International Journal of Nursing Studies	203
2.	Guo et al., 2018	Burnout and its association with resilience in nurses: A cross-sectional study	Journal of Clinical Nursing	200
3.	Moloney et al., 2018	Factors predicting Registered Nurses' intentions to leave their organization and profession: A job demands-resources framework	Journal of Advanced Nursing	161
4.	Cho et al., 2016	Nurse staffing level and overtime associated with patient safety, quality of care, and care left undone in hospitals: A cross-sectional study	International Journal of Nursing Studies	157
5.	Wan et al., 2018	Effects of work environment and job characteristics on the turnover intention of experienced nurses: The mediating role of work engagement	Journal of Advanced Nursing	138
6.	Burmeister et al., 2019	Determinants of nurse absenteeism and intent to leave: An international study	Journal of Nursing Management	115
7.	Zhao et al., 2018	Impact of workplace violence against nurses' thriving at work, job satisfaction, and turnover intention: A cross-sectional study	Journal of Clinical Nursing	108
8.	Gao et al., 2020	Nurses' experiences regarding shift patterns in isolation wards during the COVID-19 pandemic in China: A qualitative study	Journal of Clinical Nursing	99
9.	Zhang et al., 2017	Newly graduated nurses' intention to leave in their first year of practice in Shanghai: A longitudinal study	Nursing Outlook	95
10.	Birks et al., 2017	Uncovering degrees of workplace bullying: A comparison of baccalaureate nursing students' experiences during clinical placement in Australia and the UK	Nurse Education in Practice	83

### Bibliometric Network Science Mapping

**Figure 7** shows the collaborations between the researchers based on their joint publications (co-authorship). The authors with the most extensive collaborative networks are Zhang Y, Wu C, and Yang Y (22). The different network colours indicate different research groups around the globe cooperating in the field of nursing shortages.

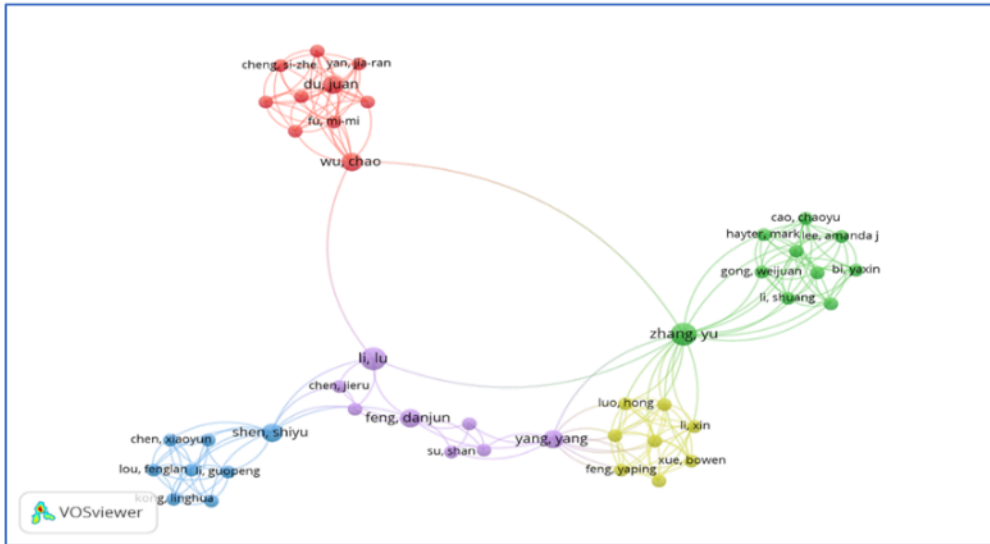
**Figure 8** effectively illustrates the broad and interdisciplinary nature of scholarly work concerning nursing shortages (co-citations).

This research draws from a diverse array of academic journals that are frequently co-cited, collectively addressing the clinical, educational, managerial, and policy aspects central to this complex issue. The clustering of these journals highlights distinct thematic areas, indicating that nursing shortages research is approached from various angles, each focusing on different facets of the problem and potential solutions. For example, some clusters concentrate on clinical outcomes, others on educational strategies for workforce development, and specific groups address human resource management and health policy implications. The interconnections observed between these

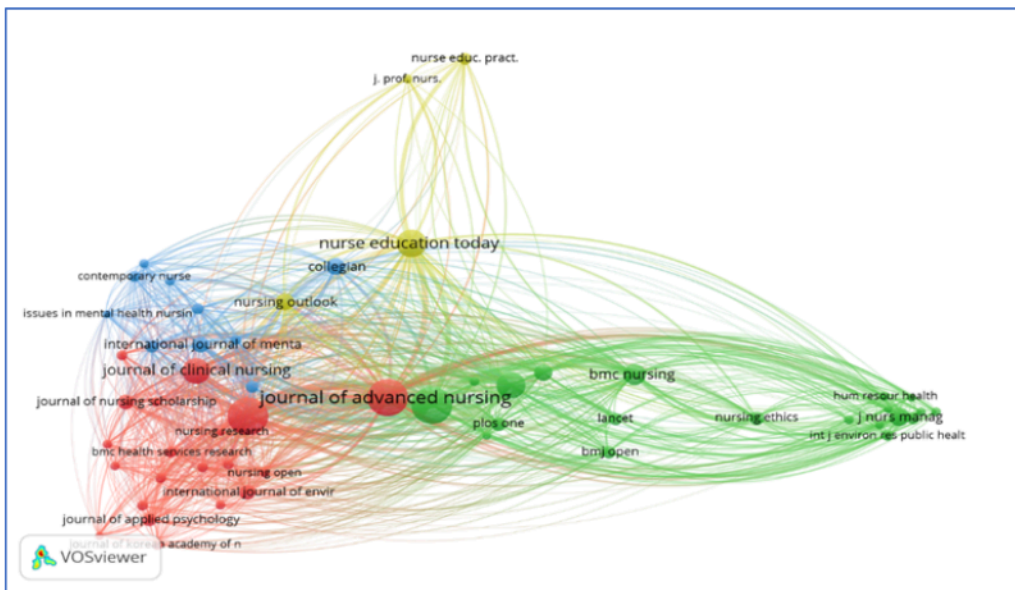
clusters signify an integrated research environment where insights from one domain frequently inform discussions and

advancements in another. This underscores the multifaceted challenge of addressing nursing shortages.

**Figure 7: Co-Authorship Analysis**



**Figure 8: Co-Citation Source Analysis**



**Figure 9** presents a co-citation or co-occurrence network of individual research articles and authors (bibliographic coupling), where each node signifies a specific paper identified by its primary author and publication year. Notably, larger nodes, such as those representing Yu, Guo, and Cho (19), underscore the extensive bibliographic connections and significant influence of these authors within this research domain. This map effectively navigates the complex research landscape surrounding nursing shortages. It visually organizes scholarly

contributions, highlighting key influential papers, delineating diverse thematic areas under investigation, and illustrating the critical interconnections which, collectively, reveal the multifaceted nature of this global health challenge.

**Figure 10** illustrates a network visualization (keywords) that reveals several key thematic clusters related to nursing shortages in the Western Pacific Region. Central keywords such as nursing shortage, workforce, burnout, turnover rate, and education highlight the





contribute to physical fatigue and emotional burnout in nurses. Nurses perform in high-stress environments due to the need for interpersonal communication and numerous encounters with life-threatening situations during working hours (23). Despite being expected to be totally prepared to work independently upon graduation, newly graduated nurses often lack support during their transition into practice, with limited access to mentorship, continuing education, and career development (26). The many high expectations placed on them may result in their early exit from the profession. The solutions to this problem include collaboration between educational institutions and hospitals to ensure they can achieve the same objectives (26). Additionally, job dissatisfaction is fuelled by low wages, poor recognition, limited promotion pathways, and workplace stressors such as bullying or lack of autonomy.

Another major factor is the ongoing migration of nurses within and beyond the region. Countries like the Philippines, Vietnam, and Indonesia continue to export nursing talent to higher-income nations such as Australia, New Zealand, and Japan. Indonesian nurses migrate to Japan due to an agreement signed between the countries that arose due to a surplus of nurses in Indonesia and low nurse retention in Japan (14). This migration movement is shaped by push factors like limited local opportunities, poor conditions, and low pay, as well as pull factors such as better salaries, safer workplaces, and growth opportunities abroad. While the Philippines is a supplier of nurses abroad, the country itself also has a nursing shortage problem (20). Foreign nurses in Malaysia were reported to develop job dissatisfaction over time for various reasons, such as paying different taxes (27). Furthermore, migration creates imbalances, leaving source countries with critical staffing gaps, particularly in rural or underserved areas. Additional contributing factors include inadequate workforce planning, insufficient government investment in health systems, and outdated policies that fail to address the evolving needs of the nursing profession. The COVID-19 pandemic further intensified these issues, exposing systemic vulnerabilities and accelerating workforce attrition across the region.

### **Theme 3: Challenges Due To Shortages**

Nursing shortages represent a significant and persistent challenge within healthcare systems globally. Insufficient staffing levels are associated with adverse patient outcomes (25), including increased mortality rates, diminished quality of care, and heightened risk of medical errors. These shortages contribute to higher workloads among existing staff, fostering professional burnout (25), emotional fatigue, and increased turnover rates. For example, a study on nurses in Malaysia resulted in the most negative responses being related to their intention to leave, indicating a high current turnover rate among Malaysian nurses (25). The problem is particularly pronounced in rural and underserved regions, where recruitment and retention of qualified nursing personnel are notably difficult. Furthermore, the nursing workforce is ageing, with a substantial proportion nearing retirement, thereby exacerbating the supply-demand imbalance.

Ethical distress is another consequence of nursing task, as nurses are forced to make difficult decisions in resource-limited settings, which can erode morale in the long term. Additionally, the lack of collaboration between education and healthcare facilities hinders the professional development of new nurses, with these bodies having different opinions on newly graduated nurses (26). The uneven geographical distribution of nurses further reinforces healthcare disparities, especially among minority and low-income populations. Overall, the financial implications for healthcare institutions are substantial, as shortages lead to increased reliance on overtime, higher turnover costs, and preventable hospital readmissions.

### **Theme 4: Policy Interventions and Strategies**

Addressing nursing shortages requires a range of policy actions focused on both increasing the number of nurses and supporting those already in the workforce. One important strategy is to strengthen nursing education systems. This should include increasing funding to nursing schools, offering scholarships to students, and hiring more qualified educators to expand the training capacity. Increasing the number of nursing students working in the sector would cover the nursing shortage (28). In many Western

Pacific countries, especially those with limited resources, these improvements can help produce more nurses to meet the growing healthcare demands. Workforce planning is also essential. Governments can use data to predict future needs and ensure enough nurses are trained and placed where they are needed most.

Another key area is improving working conditions to help retain nurses. High workloads, burnout, and lack of support often cause low job satisfaction among nurses, leading to many leaving their jobs. By offering better shift arrangements, reducing heavy workloads, and fair compensation, health systems can reduce their turnover (23,24,29). In rural or remote areas, where shortages are often worse, extra incentives like housing, bonuses, or career development opportunities might encourage nurses to stay. Meanwhile, problems related to relationships between nurses and other health providers might also be causing the high turnover among the former. Suggestions to improve these relationships include interventions such as building support among nurses through more fulfilling communication (26). Besides working nurses, graduate students also exhibit the same turnover problem. For example, one study revealed a high rate of nursing student turnover intention, which was due to various factors, including stress at work, workload, and the time needed to retrain (28). Universities must find a way to encourage students to feel that this occupation is enjoyable by introducing numerous benefits to enhance their retention rates. Managing international migration is also important, especially in countries like the Philippines, from where many nurses leave to work abroad. Policies that support ethical recruitment and offer good local opportunities can help balance this trend. Overall, a combination of education, workforce support, and fair policy can contribute to a more stable and sustainable nursing workforce in the region.

## DISCUSSION AND RECOMMENDATIONS

This bibliometric analysis offers critical insights into the complex and multifaceted issue of nursing shortages across the Western Pacific Region, spanning both structural and human factors. By synthesizing data across publication trends, country-specific challenges, institutional influence, and thematic keyword networks, this study underscores not only the

scope of the problem but also the strategies needed to mitigate it. A comprehensive discussion follows below, organized into the four key themes identified.

### Current Trends in Nursing Shortages Across The Western Pacific Region

The rising number of publications between 2016 and 2025 reflects a growing recognition of nursing shortages as a regional crisis. The peak in 2024 indicates heightened scholarly and policy concern, primarily driven by the post-COVID-19 landscape, in which shortages became even more visible and problematic due to burnout and emotional exhaustion (8). The focus on nursing shortages has shifted towards finding sustainable solutions and innovative strategies to address the crisis. This trend not only suggests a greater urgency to address the workforce challenges in the healthcare sector but also underscores the importance of academic work in finding these solutions.

Among the countries analysed, China generated the highest number of publications. However, research output volume may not be directly correlated with the severity of nursing workforce shortages; high publication production does not necessarily equate to the most critical shortages. Furthermore, research output may be driven by policy-oriented research funding initiatives that shape publication trends, as the scale and quality of research are heavily influenced by the amount of funding allocated to the scientific enterprise.

Australia and South Korea followed closely, indicating that these are robust research environments actively investigating healthcare workforce challenges. Notably, the United States, despite not being in the Western Pacific Region, also featured among the leading contributors, underscoring the substantial international interest in this country and its major influence on workforce issues in this area—likely due to global nurse migration patterns and collaborative healthcare efforts. Nurses in the United States experience high burnout; thus, the country is working on expanding the roles available to nurses and improving the status of nursing professionals (26). This global collaboration and knowledge exchange are essential for addressing the complex challenges faced by healthcare workforces worldwide. By sharing research findings and best practices across

borders, countries can cooperate to improve the quality of patient care and support the professional development of nurses globally.

Bibliometric mapping revealed that foundational concepts such as "nursing shortage", "burnout", and "turnover" have been consistent over the period, while recent themes such as "COVID-19", "mental health", and "pandemic" reflect a shift towards psychological and systemic impacts. This suggests a transition in the literature from static workforce issues to dynamic, stress-related, and resilience-based inquiries. This shift shows the evolving challenges that nurses face in today's healthcare landscape, as well as the urgent need to address mental health and resilience in nursing research and practice. By staying attuned to these changing trends, nurses can better equip themselves to navigate the complexities of their profession and provide optimal patient care.

#### **Factors Associated with the Nursing Shortage**

The shortage of nurses in this region is caused by several factors. High turnover and poor retention, two of the most frequently cited reasons, are deeply rooted in job dissatisfaction, long shifts, emotional exhaustion, low pay, and a lack of institutional support (30). Low job satisfaction is reported in many countries, including South Korea and China. Many nurses from different countries agree that job dissatisfaction arises from their low wages, despite the prevalence of overtime (29,31). Additionally, the ageing populations in this region have increased the demand for healthcare services, further exacerbating the shortage of nurses. Addressing these issues must involve comprehensive strategies that resolve the recruitment and retention challenges in nursing, as well as the root causes of job dissatisfaction and burnout.

Ohue et al. (25) reported that of the five countries they researched, nurses in Malaysia recorded the highest intention to leave the occupation. Many nurses, especially those in critical care and emergency settings, reported excessive workloads and limited recovery time, conditions that result in chronic stress and burnout. Oncology nurses also reported high burnout levels as they were working with an intensity and proximity to pain, suffering, and death, leading to massive emotional exhaustion (15). In South Korea,

the intention to leave occurs due to low nurse staffing levels in different hospital settings (31). For newly graduated nurses, their lack of mentorship and ill-preparedness for clinical reality are significant issues, often leading to premature resignation and undermining the effectiveness of the academic-to-practice transition (26). Healthcare organizations must prioritize the well-being and professional development of their nursing staff to ensure a sustainable workforce.

The situation is exacerbated by the migration of nurses, especially from countries like the Philippines, Indonesia, and Vietnam, to high-income nations such as Australia, Japan, and New Zealand. In the case of Indonesia and Japan, a bilateral agreement led to the inflow of nurses from Indonesia, filling local shortages in Japan but contributing to scarcity in the source country (14). Many newly graduated nurses also exhibit a high turnover rate, which is affected by many factors, including work environments being different than expected, insufficient skills, difficulty in relations with seniors, and loss of interest (32).

Furthermore, job dissatisfaction is not solely an economic factor; it also covers a lack of professional recognition, toxic workplace culture, and limited promotion opportunities. The COVID-19 pandemic amplified these issues, particularly through psychological fatigue, workplace risk, and ethical dilemmas, all of which contributed to career exits and reduced morale among those who remained.

#### **Challenges Arising Due To Shortages**

The effects of nursing shortages extend far beyond staffing metrics and into the core of healthcare delivery quality and safety. Undersupply directly correlates with adverse patient outcomes (31), including medication errors, increased mortality, delayed treatment, and lower patient satisfaction (25). When nurses are overworked, their ability to provide comprehensive and compassionate care diminishes.

Nursing resources must be evenly distributed. Rural and remote areas, especially in countries like Cambodia, Laos, and Papua New Guinea, face disproportionate shortages. Countries such as the Philippines also have shortages, particularly in rural areas (30). Even in more developed systems such as those of Australia and South Korea, rural

regions lag in nurse-per-patient ratios and career support. This distribution inequity demands immediate attention and action.

Another major barrier is the capacity of nursing education systems. The importance of adequate clinical training cannot be overstated. Many aspiring students are rejected due to a lack of clinical placement slots, insufficient faculty staff, and underfunded institutions. In South Korea, the turnover rate was reportedly high due to the rate among new graduate nurses (31). Even those entering the system face limited exposure to real-world clinical complexity, leading to gaps between training and readiness for practice. This highlights the need for improvements in nursing education.

### **Policy Interventions and Strategies**

To reverse the nursing shortage trajectory, a comprehensive, multi-level policy approach is urgently required. First and foremost, investments in education are vital. Governments and health ministries need to expand the intake capacity of nursing schools; support tuition and living costs for students; and increase salaries and incentives for nursing educators to address faculty shortages.

Workforce planning models should move beyond reactive staffing to predictive analytics, considering demographic trends, disease burden, and retirement rates. Countries like Australia have adopted national strategies for health workforce modelling, which could serve as a blueprint for others. To improve retention, policy must focus on enhancing working conditions, such as reducing shift lengths, balancing staff-patient ratios, and providing mental health support. Introducing flexible work schedules (16) and in-house counselling may also alleviate the long-term stress and prevent burnout that can lead to poor retention. Additional incentives such as housing, hazard pay, and fast-track promotion schemes have shown promise with regard to rural deployment, with potential staff now presented with many factors that may lead them to decide to work in rural areas (33).

Moreover, the potential for positive change lies in improving inter-professional dynamics. Poor relationships with physicians and administrators often drive nurse dissatisfaction. Interventions to foster

collaborative team environments, including shared decision-making models and inter-professional education, can significantly improve retention and morale (25). Such improvements offer hope for more harmonious and effective healthcare systems.

Addressing migration requires a commitment to ethical recruitment practices and stronger domestic retention strategies. Policies could include bonding programmes for scholarship recipients, career progression guarantees, and incentives to stay in public service. Additionally, universities must introduce career development frameworks and workplace immersion programmes for new graduates to improve their clinical readiness and reduce early attrition among these cohorts (3). This ethical approach would ensure a fair and just system for all involved.

Finally, envisioning a future of strengthened health systems and cross-border cooperation among Western Pacific countries, possibly under WHO guidance, could facilitate shared frameworks for nurse mobility, ethical workforce exchange, and unified strategies. This approach would ensure that health systems are fortified without depleting one another, offering a promising outlook for the future of nursing.

### **LIMITATIONS**

This bibliometric analysis has various limitations. Firstly, it is based on data from only one database, Scopus, so it may have excluded relevant studies from other sources. The analysis also focused only on English-language publications, so research in other languages from the Western Pacific Region might have been missed. In addition, the results depend on the keywords used, which some important studies may not have included if they used different terms. The method employed shows patterns and trends but does not assess the quality or findings of each article. Also, there could be citation bias due to older articles naturally accruing more citations than newer articles. Finally, some studies may not clearly mention their geographic focus, which might have affected the accuracy of region-specific results.

### **CONCLUSION**

This bibliometric analysis examined the scope, trends, and key themes related to nursing shortages in the Western Pacific Region. By

using VOSviewer to visualize co-occurring keywords, the study identified several major areas of concern, including limited workforce supply, high burnout rates, challenges in nursing education, and the growing impact of international nurse migration. The COVID-19 pandemic further intensified these issues, illustrating more extensively the need for urgent and sustainable solutions.

The analysis also highlights the increasing focus on mental health, retention, and workforce planning in the recent literature, demonstrating a shift towards addressing both structural and human-centred aspects of the nursing shortage. Despite some limitations, the study offers valuable insights into how researchers and policymakers approach this critical issue. The findings suggest that strengthening nursing education systems, improving working conditions, and developing fair and effective policy interventions are essential steps in reducing nursing shortages and improving healthcare access in the region.

Overall, this study contributes to a better understanding of the current state of research on nursing shortages in the Western Pacific Region. It also provides a foundation for future work that can guide evidence-based policies and workforce development strategies.

#### CONFLICTS OF INTEREST

The author declares no conflict of interest.

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#### AUTHOR CONTRIBUTIONS

**SML:** Conceptualizing, methodology design, data analysis, interpretation of results, preparation of original draft, critical revision, and final validation.

**SR:** Conceptualizing, material support, data analysis, interpretation of results, critical revision.

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