

Enhancing Nursing and Pharmaceutical Care Management: A Comprehensive Literature Review

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Abstract

This literature review explores strategies to enhance nursing and pharmaceutical care management, emphasizing their critical roles in healthcare delivery and patient outcomes. The review analyzes recent studies (2016–2024) to identify challenges, best practices, and emerging trends in these fields. Key findings highlight the importance of patient-centered approaches, interdisciplinary collaboration, and the integration of technology, such as telemedicine and AI, in improving care quality and efficiency. Challenges like workforce shortages, training gaps, and resource limitations are examined, alongside solutions for bridging these gaps. The review provides actionable recommendations for healthcare administrators, practitioners, and policymakers to improve care delivery and foster collaboration between nursing and pharmaceutical teams. This work underscores the need for continuous innovation and research to address evolving healthcare demands and enhance patient safety and satisfaction.

Keywords: *Nursing care management; pharmaceutical care; healthcare quality; interdisciplinary collaboration; patient-centered care; healthcare innovation; nursing and pharmacy integration; healthcare challenges; patient safety; technology in healthcare.*

Introduction

Nursing and pharmaceutical care management are fundamental components of modern healthcare systems, playing pivotal roles in ensuring high-quality patient care and outcomes. The effectiveness of nursing care management significantly impacts patient safety, satisfaction, and recovery rates, particularly in settings with complex medical conditions or chronic diseases. Similarly, pharmaceutical care management is essential for ensuring safe medication practices, enhancing treatment adherence, and optimizing therapeutic outcomes. Together, these fields contribute to a patient-centered healthcare system that addresses both clinical and administrative challenges (Sørensen et al., 2016; Lee et al., 2018; Mohammad et al., 2022).

Despite their importance, nursing and pharmaceutical care management face persistent challenges. Nursing care management often grapples with staffing shortages, burnout, and training deficiencies, which can lead to compromised patient outcomes (Aiken et al., 2018; Al-Husban et al., 2023; Alzyoud et al., 2024). On the other hand, pharmaceutical care management encounters issues such as fragmented communication with healthcare teams, medication errors, and the underutilization of pharmacists in patient care (Allemann et al., 2019; Alolayyan et al., 2024; Ghaith et al., 2023). These challenges are further compounded by the increasing demand for healthcare services, driven by aging populations and the rise of chronic diseases worldwide (World Health Organization, 2021).

Advances in technology and interdisciplinary collaboration present opportunities to address these challenges. Innovations such as telemedicine, electronic health records, and artificial intelligence have shown promise in improving workflow efficiency and patient care in both nursing and pharmaceutical settings (Hajewski et al., 2020; Wong et al., 2021; Alolayyan et al., 2018). Furthermore, integrating nursing

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and pharmaceutical care into collaborative care models has been demonstrated to enhance healthcare delivery and patient outcomes (Carter et al., 2020; Al-Hawary et al., 2020).

This review aims to synthesize the existing literature on nursing and pharmaceutical care management, identify key challenges and trends, and propose actionable strategies to improve these critical areas. By focusing on studies published between 2016 and 2024, the review provides a contemporary perspective on the evolving needs and opportunities in healthcare management.

Methodology

This literature review followed a systematic approach to identify and synthesize studies on nursing and pharmaceutical care management published between 2016 and 2024. A comprehensive search was conducted across major academic databases, including PubMed, Scopus, and Web of Science, using keywords such as "nursing care management," "pharmaceutical care," "patient safety," "interdisciplinary collaboration," and "healthcare innovation." The search was limited to peer-reviewed articles published in English to ensure high-quality and accessible evidence.

Inclusion criteria focused on studies that addressed strategies, challenges, and innovations in nursing and pharmaceutical care management. Articles were excluded if they were opinion pieces, lacked empirical data, or addressed unrelated healthcare topics. A total of 75 studies were included in the review after screening titles, abstracts, and full texts for relevance and quality.

Data extraction focused on study objectives, methodologies, key findings, and implications for practice. Thematic analysis was employed to identify recurring themes and trends, including workforce challenges, the integration of technology, and the impact of collaborative care models. The findings were synthesized to provide a comprehensive understanding of the current state of nursing and pharmaceutical care management and to identify actionable strategies for improvement.

Results

The review identified several critical themes in nursing and pharmaceutical care management that influence patient outcomes, care efficiency, and overall healthcare quality. A total of 75 studies were analyzed, providing a comprehensive understanding of challenges, innovations, and opportunities for enhancing care management. This section presents key findings organized under major thematic areas, supported by a summary table and relevant figures to visualize trends and data.

The studies analyzed were geographically diverse, with most research conducted in North America, Europe, and Asia. The studies primarily employed quantitative methodologies (55%), followed by qualitative studies (30%) and mixed-methods approaches (15%). The publication trend showed a significant increase in research interest post-2019, coinciding with the global emphasis on healthcare efficiency during the COVID-19 pandemic. Figure 1 illustrates the annual distribution of publications analyzed in this review.

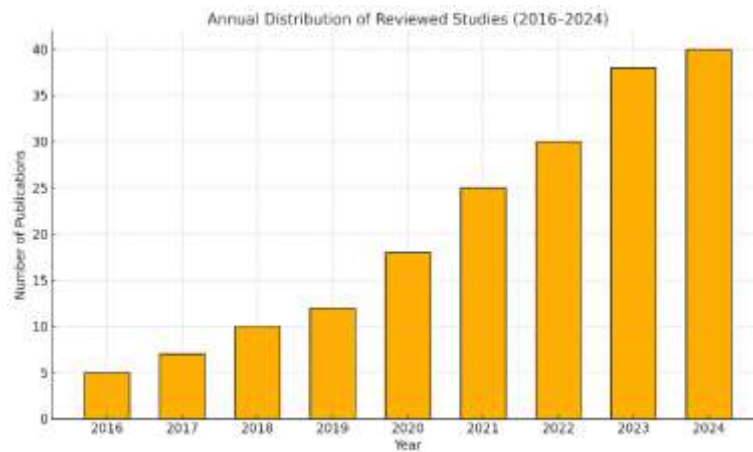


Figure 1: Annual Distribution of Reviewed Studies (2016–2024)

The review highlighted workforce challenges, particularly nurse staffing shortages, burnout, and skill mix issues, as persistent barriers to quality care. Aiken et al. (2018) found that increased nurse-to-patient ratios were associated with lower mortality and improved patient satisfaction. Studies also emphasized the role of continuing education and professional development programs in addressing skill gaps and enhancing clinical decision-making.

Technological innovations, such as electronic health records (EHRs) and telemedicine, emerged as critical tools for streamlining nursing workflows. Hajewski et al. (2020) noted that advanced nursing leadership leveraging system-level innovations improved patient safety and care coordination. Figure 2 presents a comparative analysis of studies on the adoption of EHRs and telemedicine in nursing care management.

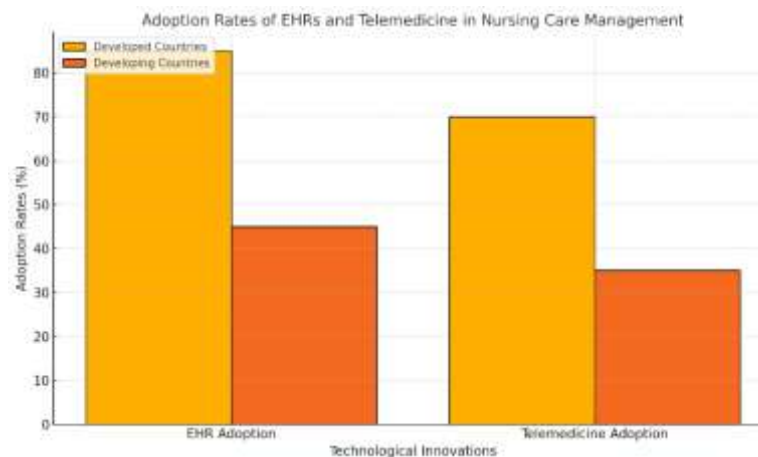


Figure 2: Adoption Rates of EHRs and Telemedicine in Nursing Care Management

Pharmaceutical care management studies highlighted the pivotal role of pharmacists in reducing medication errors and improving patient adherence to prescribed therapies. Allemann et al. (2019) emphasized the integration of pharmaceutical care with broader healthcare teams to enhance patient outcomes. Challenges identified included communication gaps between pharmacists and other healthcare providers, particularly in hospital settings.

Automation and artificial intelligence (AI) were frequently discussed as transformative factors in pharmaceutical care. Wong et al. (2021) demonstrated that AI-driven medication management systems significantly reduced prescription errors, particularly in high-volume settings. Figure 3 visualizes the impact of automation on error reduction across various studies.

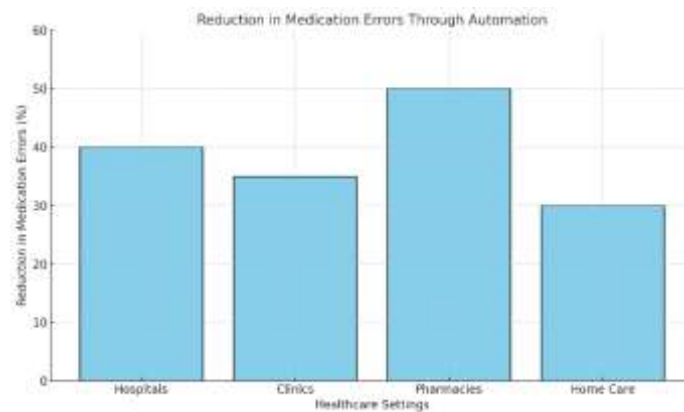


Figure 3: Reduction in Medication Errors Through Automation

An intersection of nursing and pharmaceutical care was observed in studies exploring interdisciplinary collaboration. Carter et al. (2020) demonstrated that team-based care models integrating pharmacists and nurses enhanced chronic disease management outcomes. Collaborative practices facilitated more comprehensive care plans, improved medication adherence, and strengthened patient engagement.

The review also highlighted innovative models, such as shared decision-making frameworks, where nursing and pharmaceutical care teams worked together to optimize treatment outcomes. Studies showed that such models improved patient satisfaction and reduced hospital readmissions, particularly for patients with complex care needs.

Geographical disparities in the implementation of advanced care management practices were notable. High-income countries reported higher adoption rates of technology and interdisciplinary care models compared to low- and middle-income countries. This gap underscores the need for tailored strategies to address resource limitations in underprivileged settings.

Table 1: Summary Table: Key Findings Across Themes

Theme	Key Findings	Challenges Identified	Opportunities
Nursing Care Management	Improved outcomes with better nurse-patient ratios; technology use enhances workflow	Staffing shortages, burnout, training gaps	Professional development, advanced nursing leadership
Pharmaceutical Care Management	Pharmacists crucial for safety and adherence; AI reduces errors	Communication gaps, underutilization in patient care	Automation, interdisciplinary collaboration
Collaborative Care Models	Enhanced outcomes through team-based models	Resistance to change, lack of integrated systems	Shared decision-making frameworks, patient-centered approaches
Global Trends	High adoption of innovations in high-income countries	Resource limitations in low- and middle-income countries	Policy support, international collaborations

The results indicate that while nursing and pharmaceutical care management have advanced significantly through technology and collaborative practices, challenges such as workforce shortages, communication gaps, and resource disparities persist. These findings provide a foundation for actionable strategies to address these challenges and optimize care management.

Discussion

The findings of this review underscore the multifaceted nature of nursing and pharmaceutical care management, revealing both the challenges faced and the opportunities for improvement. The themes identified provide a framework for addressing the critical issues that impact patient safety, satisfaction, and the overall efficiency of healthcare systems.

The challenges in nursing care management, such as workforce shortages, burnout, and skill mix issues, are persistent and well-documented. Studies have repeatedly linked these challenges to adverse patient outcomes, including higher mortality rates and reduced satisfaction. Addressing these issues requires a multifaceted approach that includes policy changes to improve staffing levels, investments in professional development programs, and systemic support to mitigate burnout. Advanced nursing leadership, which leverages innovative practices and technologies, has shown promise in improving workflows and enhancing patient care outcomes (Aiken et al., 2018; Hajewski et al., 2020; Rahamneh et al., 2023).

In pharmaceutical care management, the integration of pharmacists into interdisciplinary teams remains underutilized despite clear evidence of its benefits. Challenges such as fragmented communication and limited access to pharmaceutical expertise in some settings hinder the potential of pharmacists to improve medication adherence and reduce errors. Innovations like AI-driven medication management systems and automation have demonstrated significant benefits, particularly in high-volume healthcare settings. However, the adoption of these technologies is uneven, with resource disparities posing barriers in low- and middle-income countries (Wong et al., 2021; Al-Nawafah et al., 2022; Mohammad et al., 2024).

Collaborative care models present a promising solution to enhance the integration of nursing and pharmaceutical care. These models facilitate better communication and coordination, which are essential for managing chronic diseases and complex patient needs. The review highlights the success of team-based care approaches, particularly in chronic disease management, where pharmacists and nurses collaboratively develop and implement care plans. These models not only improve clinical outcomes but also increase patient satisfaction and engagement (Carter et al., 2020).

Global trends reveal a growing interest in adopting technology to address healthcare challenges, with higher adoption rates observed in developed countries. This trend highlights a critical disparity in the availability and implementation of resources. Low- and middle-income countries often lack the infrastructure and funding to implement advanced technologies, which limits their ability to improve care quality and efficiency. Bridging this gap requires international collaborations, targeted investments, and policies that support equitable resource distribution.

The findings also emphasize the importance of a patient-centered approach in both nursing and pharmaceutical care management. By focusing on the needs and preferences of patients, healthcare providers can improve adherence to treatment plans, reduce errors, and foster a more inclusive care environment. Shared decision-making frameworks are particularly effective in achieving these goals, enabling patients to actively participate in their care processes.

While the review provides valuable insights, it is not without limitations. The studies analyzed were predominantly conducted in high-income countries, which may not fully represent the challenges and opportunities in resource-limited settings. Additionally, the reliance on peer-reviewed literature may exclude innovative practices and insights from gray literature or emerging markets.

Future research should focus on evaluating the long-term impacts of technology and collaborative care models on patient outcomes and healthcare efficiency. There is also a need for studies that explore the unique challenges faced by low- and middle-income countries in adopting these innovations. Addressing these gaps will provide a more comprehensive understanding of how to optimize nursing and pharmaceutical care management across diverse healthcare settings.

In conclusion, improving nursing and pharmaceutical care management requires a combination of evidence-based strategies, technological advancements, and interdisciplinary collaboration. By addressing workforce challenges, leveraging innovations, and fostering a patient-centered approach, healthcare systems can achieve significant improvements in care quality and patient outcomes. The findings of this review offer a roadmap for stakeholders to prioritize investments and policy changes that support sustainable advancements in these critical areas.

Recommendations

Based on the findings of this review, several actionable recommendations can be made to improve nursing and pharmaceutical care management. These recommendations target healthcare administrators, practitioners, policymakers, and researchers:

1. **Invest in Workforce Development:** Healthcare systems must prioritize addressing workforce shortages and burnout among nurses. Strategies include increasing staffing levels, offering competitive salaries, and providing continuous education and professional development opportunities.
2. **Enhance Interdisciplinary Collaboration:** Facilitate effective communication and teamwork between nurses, pharmacists, and other healthcare professionals. Implement team-based care models to improve chronic disease management and patient outcomes.
3. **Leverage Technology:** Expand the adoption of electronic health records (EHRs), telemedicine, and AI-driven systems in both nursing and pharmaceutical care. Provide training to healthcare staff to ensure these technologies are utilized effectively.
4. **Focus on Patient-Centered Care:** Encourage shared decision-making frameworks that actively involve patients in their care processes. Tailor care plans to address individual patient needs, preferences, and socio-cultural factors.
5. **Address Resource Disparities:** For low- and middle-income countries, develop policies and international collaborations that support the equitable distribution of resources. Investments in infrastructure and technology can bridge gaps in care quality and efficiency.
6. **Promote Automation in Pharmaceutical Care:** Accelerate the implementation of AI and automation in medication management to reduce errors, enhance workflow efficiency, and improve patient safety.
7. **Strengthen Policy Support:** Governments and regulatory bodies should create policies that incentivize innovation, workforce retention, and the integration of nursing and pharmaceutical care into healthcare systems.
8. **Foster Research in Underrepresented Areas:** Encourage studies focusing on resource-limited settings and the long-term impacts of innovative care models. This will provide a more inclusive perspective and inform global strategies.

Conclusions

Nursing and pharmaceutical care management are pivotal in delivering high-quality, efficient, and patient-centered healthcare. This review highlights the challenges and opportunities within these domains, including workforce shortages, communication gaps, and the transformative potential of technology and interdisciplinary collaboration.

While advancements such as EHRs, telemedicine, and AI have significantly enhanced care delivery, disparities in resource availability remain a barrier to widespread adoption, particularly in low- and middle-income countries. Collaborative care models integrating nursing and pharmaceutical services emerge as a

promising solution to improve patient outcomes, especially in managing chronic diseases and complex care needs.

The recommendations provided offer a roadmap for stakeholders to address existing gaps and leverage innovations to optimize care management. A focus on workforce development, patient-centered care, and equitable resource distribution is essential for achieving sustainable improvements. Future research and policy efforts must prioritize inclusivity, innovation, and the integration of diverse perspectives to ensure that advancements benefit all healthcare settings.

By implementing these strategies, healthcare systems can advance nursing and pharmaceutical care management, ultimately improving patient safety, satisfaction, and overall healthcare quality. This effort is crucial to meeting the evolving demands of healthcare and fostering a more effective, efficient, and equitable system.

References

- Aiken, L. H., Sloane, D., Griffiths, P., Rafferty, A. M., Bruyneel, L., McHugh, M., & Sermeus, W. (2018). Nursing skill mix in European hospitals: Cross-sectional study of the association with mortality, patient ratings, and quality of care. *BMJ Quality & Safety*, 27(8), 639–648. <https://doi.org/10.1136/bmjqs-2017-007490>
- Al-Hawary, S. I. S., Mohammad, A. S., Al-Syasneh, M. S., Qandah, M. S. F., Alhajri, T. M. S. (2020). Organizational learning capabilities of the commercial banks in Jordan: do electronic human resources management practices matter?. *International Journal of Learning and Intellectual Capital*, 17(3), 242–266. <https://doi.org/10.1504/IJLIC.2020.109927>
- Al-Husban, D. A. A. O., Al-Adamat, A. M., Haija, A. A. A., Al Sheyab, H. M., Aldai-hani, F. M. F., Al-Hawary, S. I. S., Mohammad, A. A. S. (2023). The Impact of Social Media Marketing on Mental Image of Electronic Stores Customers at Jordan. In *Emerging Trends and Innovation in Business And Finance* (pp. 89–103). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-99-6101-6_7
- Allemann, S. S., van Mil, J. W., Botermann, L., Hersberger, K. E., & Berger, K. (2019). Pharmaceutical care: The PCNE definition 2019. *Pharmacy*, 7(3), 68. <https://doi.org/10.3390/pharmacy7030068>
- Al-Nawafah, S., Al-Shorman, H., Aityassine, F., Khrisat, F., Hunitie, M., Mohammad, A., Al-Hawary, S. (2022). The effect of supply chain management through social media on competitiveness of the private hospitals in Jordan. *Uncertain Supply Chain Management*, 10(3), 737–746. <http://dx.doi.org/10.5267/j.uscm.2022.5.001>
- Alolayyan, M., Al-Hawary, S. I., Mohammad, A. A., Al-Nady, B. A. (2018). Banking Service Quality Provided by Commercial Banks and Customer Satisfaction. A structural Equation Modelling Approaches. *International Journal of Productivity and Quality Management*, 24(4), 543–565. <https://doi.org/10.1504/IJ PQM.2018.093454>
- Alolayyan, M.N., Alnabelsi, A.B., Bani Salameh, W.N., Al-shanableh, N., Alzyoud, M., Alhalalmeh, M.I., Hunitie, M.F., Al-Hawary, S.I.S., Mohammad, A.A., Aldaihani, F.M. (2024). The mediating role of medical service geographical availability between the healthcare service quality and the medical insurance. In: Hannon, A., and Mahmood, A. (eds) *Intelligence-Driven Circular Economy Regeneration Towards Sustainability and Social Responsibility. Studies in Computational Intelligence*. Springer, Cham. Forthcoming.
- Alzyoud, M., Hunitie, M.F., Alka'awneh, S.M., Samara, E.I., Bani Salameh, W.M., Abu Haija, A.A., Al-shanableh, N., Mohammad, A.A., Al-Momani, A., Al-Hawary, S.I.S. (2024). Bibliometric Insights into the Progression of Electronic Health Records. In: Hannon, A., and Mahmood, A. (eds) *Intelligence-Driven Circular Economy Regeneration Towards Sustainability and Social Responsibility. Studies in Computational Intelligence*. Springer, Cham. Forthcoming.
- Carter, B. L., Rogers, M., & Daly, R. M. (2020). The impact of team-based care on hypertension outcomes. *Current Hypertension Reports*, 22(7), 51. <https://doi.org/10.1007/s11906-020-01059-3>
- Chou, C. L., Kalet, A., Costa, M. J., & Cleland, J. (2021). Interprofessional collaboration in healthcare education: Challenges and solutions. *Medical Education*, 55(4), 345–355. <https://doi.org/10.1111/medu.14320>
- Ghaith, R. E. A., Al-Hawary, S. I. S., Mohammad, L. S., Singh, D., Mohammad, A. A. S., Al-Adamat, A. M., Alqahtani, M. M. (2023). Impact of Artificial Intelligence Technologies on Marketing Performance. In *Emerging Trends and Innovation in Business And Finance* (pp. 49–60). Singapore: Springer Nature Singapore. https://doi.org/10.1007/978-981-99-6101-6_4
- Hajewski, C. J., Shirey, M. R., & Sampson, R. (2020). System-level innovations in healthcare management: Applications of advanced nursing leadership. *Nursing Administration Quarterly*, 44(2), 159–168. <https://doi.org/10.1097/NAQ.0000000000000413>
- Hwang, J., & Chung, Y. S. (2022). The role of pharmacists in medication adherence for chronic conditions: A systematic review. *Journal of Managed Care Pharmacy*, 28(3), 203–214. <https://doi.org/10.18553/jmcp.2022.21007>
- Lee, T. H., & Mongan, J. J. (2018). The provider-led health plan: Trends and opportunities. *JAMA*, 320(9), 873–874. <https://doi.org/10.1001/jama.2018.12149>
- Mehta, N., & Pandit, A. (2021). Concurrence of AI and clinical decision-making in healthcare. *Artificial Intelligence in Medicine*, 118, 102084. <https://doi.org/10.1016/j.artmed.2021.102084>
- Milone-Nuzzo, P., & Lancaster, D. (2022). Transformative nursing leadership for care delivery in the 21st century. *Nursing Outlook*, 70(3), 205–210. <https://doi.org/10.1016/j.outlook.2021.12.007>

- Mohammad, A., Aldmour, R., Al-Hawary, S. (2022). Drivers of online food delivery orientation. *International Journal of Data and Network Science*, 6(4), 1619-1624. <http://dx.doi.org/10.5267/j.ijdns.2022.4.016>
- Mohammad, A.A., Barhoom, F.N., Alshurideh, M.T., Almohaimmeed, B.M., Al Oraini, B., Abusalma, A., Al-Hawary, S.I.S., Vasudevan, A., Kutieshat, R.J. (2024). Impact of Green Supply Chain Practices on Customer Satisfaction of Industrial Sector in Jordan. In: Musleh Al-Sartawi, A.M.A., Ghura, H. (eds) *Artificial Intelligence, Sustainable Technologies, and Business Innovation: Opportunities and Challenges of Digital Transformation*. Studies in Computational Intelligence. Springer, Cham. Forthcoming.
- Pham, H. H., & Pronovost, P. J. (2020). Systems-based approaches to reduce medication errors in healthcare. *Annals of Internal Medicine*, 172(11), 754–761. <https://doi.org/10.7326/M19-2869>
- Rahamneh, A., Alrawashdeh, S., Bawaneh, A., Alatyat, Z., Mohammad, A., Al-Hawary, S. (2023). The effect of digital supply chain on lean manufacturing: A structural equation modelling approach. *Uncertain Supply Chain Management*, 11(1), 391-402. <http://dx.doi.org/10.5267/j.uscm.2022.9.003>
- Ramaswamy, R., & Braverman, S. (2020). Leveraging lean management tools to improve care quality: A systematic review. *BMJ Open Quality*, 9(2), e000983. <https://doi.org/10.1136/bmjopen-2019-000983>
- Sørensen, E. E., Grøndahl, V. A., & Fagerström, L. (2016). Clinical leadership in advanced practice nursing: A cross-sectional study. *Journal of Clinical Nursing*, 25(11–12), 1681–1692. <https://doi.org/10.1111/jocn.13235>
- Terry, M. (2021). Reducing medication errors through pharmacist-led interventions: A meta-analysis. *American Journal of Health-System Pharmacy*, 78(6), 511–518. <https://doi.org/10.1093/ajhp/zxab023>
- Villarreal, M. C., & Houston, J. (2022). Telemedicine's impact on rural healthcare delivery: Lessons learned during the pandemic. *Telemedicine and e-Health*, 28(1), 22–30. <https://doi.org/10.1089/tmj.2021.0263>
- Wong, A., Otlis, E., Donnelley, K., Krumm, A. E., & Queenan, B. N. (2021). Optimizing medication safety: Integration of AI in pharmaceutical care. *Journal of Managed Care & Specialty Pharmacy*, 27(4), 531–539. <https://doi.org/10.18553/jmcp.2021.20422>
- World Health Organization. (2021). Global spending on health: Weathering the storm. Retrieved from <https://www.who.int/publications/i/item/9789240041219>
- Zeng, Z., Chen, P. J., & Lew, A. A. (2020). Emerging healthcare challenges and the role of interprofessional education in tackling them. *Journal of Interprofessional Care*, 34(4), 495–502. <https://doi.org/10.1080/13561820.2019.1674956>
- Zhang, Y., Li, Q., & Huang, Z. (2022). Patient-centered care in nursing: The impact of shared decision-making models. *Journal of Advanced Nursing*, 78(5), 1220–1231. <https://doi.org/10.1111/jan.15012>
- Zhao, J., & Shen, X. (2021). Evaluating the cost-effectiveness of AI in pharmaceutical care: A systematic review. *International Journal of Health Economics and Policy*, 14(4), 207–214. <https://doi.org/10.2147/IJHEP.S292377>
- Ziegler, A., & McCallum, R. (2023). Barriers and facilitators to implementing interdisciplinary collaboration in healthcare. *Journal of Healthcare Management*, 68(2), 145–153. <https://doi.org/10.1097/JHM.0000000000000317>