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REVIEW ARTICLE OPEN ACCESS

EVALUATING QUALITY MANAGEMENT IN PHARMACEUTICAL CARE SERVICES: A CRITICAL REVIEW

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ABSTRACT

Quality management in pharmaceutical care services is critical to ensuring patient safety, effective treatment outcomes, and overall healthcare efficiency. This critical review evaluates the current practices, standards, and regulatory frameworks governing quality management in pharmaceutical care. By examining various quality indicators, best practices, and methodologies, the review identifies strengths, weaknesses, opportunities, and threats within the system. The analysis highlights the pivotal role of regulatory bodies and quality standards in maintaining high levels of service, while also addressing the challenges faced in implementing effective quality management systems. Case studies of successful initiatives are included to illustrate practical applications and outcomes. The review concludes with recommendations for enhancing quality management practices and emphasizes the need for continuous improvement and innovation in the pharmaceutical sector. The findings are intended to guide healthcare providers, policymakers, and researchers in developing and refining strategies to achieve excellence in pharmaceutical care services.

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INTRODUCTION

Pharmaceutical care services are integral to the healthcare system, playing a crucial role in the safe and effective use of medications. The primary objective of pharmaceutical care is to optimize patient outcomes through the responsible provision of drug therapy (Hepler & Strand, 1990). Quality management within these services is essential to ensure that the care provided meets established standards and achieves desired health outcomes. This critical review aims to evaluate the current state of quality management in pharmaceutical care services, exploring existing practices, regulatory frameworks, and methodologies. The importance of quality management in healthcare cannot be overstated. It encompasses a range of activities designed to improve the quality of care delivered to patients, including the development and implementation of standards, the monitoring and evaluation of performance, and the continuous improvement of processes (Donabedian, 1988). In the context of pharmaceutical care, quality management is vital for ensuring patient safety, enhancing the efficacy of treatments, and minimizing the risk of adverse drug events (ASHP, 2013). Various regulatory bodies and professional organizations have established guidelines and standards for quality management in pharmaceutical care. These include the International Organization for Standardization (ISO), the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), and national regulatory agencies such as the U.S. Food and Drug Administration (FDA) and the European Medicines Agency (EMA) (ISO, 2015; JCAHO, 2020; FDA, 2018; EMA, 2019). Adherence to these standards helps ensure consistency and reliability in the delivery of pharmaceutical services. Despite the existence of these frameworks, implementing effective quality management in pharmaceutical care remains challenging. Issues such as resource limitations, varying levels of staff training, and differences in regulatory environments can impede the consistent application of quality management practices (Wiedenmayer et al., 2006). Moreover, the rapidly evolving nature of healthcare and pharmaceuticals necessitates ongoing adaptation and innovation in quality management strategies. This review will critically examine the current practices and standards of quality management in

pharmaceutical care services. It will explore key quality indicators, highlight best practices, and analyze the challenges and opportunities for improvement. By providing a comprehensive evaluation of the existing landscape, this review aims to contribute to the development of more effective and efficient quality management systems in pharmaceutical care.

LITERATURE REVIEW

Historical Context: The concept of pharmaceutical care emerged in the late 20th century, primarily defined by Hepler and Strand (1990), who emphasized the pharmacist's role in ensuring optimal medication outcomes for patients. Since then, the scope of pharmaceutical care has expanded, integrating more comprehensive approaches to patient management and medication therapy. The evolution of pharmaceutical care reflects broader trends in healthcare towards patient-centered practices and outcomes-based models.

Current Standards: Quality management in pharmaceutical care is guided by various international and national standards. The International Organization for Standardization (ISO) provides a widely recognized framework through ISO 9001:2015, which outlines requirements for quality management systems (ISO, 2015). The Joint Commission on Accreditation of Healthcare Organizations (JCAHO) also offers standards specifically tailored to healthcare settings, focusing on patient safety, medication management, and performance improvement (JCAHO, 2020). In addition, professional organizations like the American Society of Health-System Pharmacists (ASHP) have developed guidelines that address the roles and responsibilities of pharmacy and therapeutics committees, formulary management, and the implementation of quality improvement initiatives (ASHP, 2013).

Regulatory Framework: Regulatory bodies play a critical role in enforcing quality standards in pharmaceutical care. In the United States, the Food and Drug Administration (FDA) sets stringent guidelines for drug quality, safety, and efficacy, ensuring that pharmaceutical products meet rigorous standards before reaching the market (FDA, 2018). Similarly, the European Medicines Agency (EMA) oversees the approval and monitoring of medicinal products in the European Union, emphasizing quality management principles throughout the drug lifecycle (EMA, 2019).

METHODOLOGIES

Various methodologies are employed to evaluate and improve quality in pharmaceutical care services. These include process mapping, root cause analysis, and Six Sigma, which are designed to identify inefficiencies, reduce errors, and enhance overall performance (Juran, 1999; Harry & Schroeder, 2000). Additionally, the Plan-Do-Check-Act (PDCA) cycle is commonly used in continuous quality improvement efforts, promoting iterative testing and refinement of processes (Deming, 1986).

Quality Indicators: Key quality indicators in pharmaceutical care include medication error rates, patient satisfaction scores, adherence to clinical guidelines, and outcomes of medication therapy management (MTM) programs (Albabtain et al., 2021). Monitoring these indicators helps healthcare providers identify areas for improvement and measure the impact of quality management initiatives.

Best Practices: Best practices in pharmaceutical care quality management involve a multidisciplinary approach, integrating the expertise of pharmacists, physicians, nurses, and other healthcare professionals. Effective communication, comprehensive documentation, and the use of electronic health records (EHRs) are critical components of high-quality pharmaceutical care (Nelson et al., 2017). Furthermore, continuous education and training for healthcare staff are essential to maintain and enhance quality standards.

Challenges: Despite established standards and methodologies, several challenges persist in implementing effective quality management in pharmaceutical care. Resource limitations, such as staffing shortages and budget constraints, can hinder quality improvement efforts (Kruk et al., 2018). Additionally, variations in regulatory environments and healthcare practices across different regions complicate the standardization of quality management practices.

Opportunities: Opportunities for enhancing quality management in pharmaceutical care include the adoption of advanced technologies, such as artificial intelligence (AI) and machine learning, to improve medication safety and patient outcomes (Topol, 2019). Additionally, fostering a culture of continuous improvement and collaboration among healthcare professionals can drive innovation and excellence in pharmaceutical care services.

Quality Management in Pharmaceutical Care

Quality Indicators: Quality indicators are essential for measuring the effectiveness of pharmaceutical care services. Common indicators include medication error rates, patient satisfaction, adherence to clinical guidelines, and the outcomes of medication therapy management (MTM) programs. Medication error rates, for instance, provide insight into the safety and reliability of pharmaceutical services (ASHP, 2013). Patient satisfaction scores gauge the perceived quality of care from the patient's perspective, reflecting their overall experience and trust in the services provided (Wiedenmayer et al., 2006). Adherence to clinical guidelines ensures that pharmaceutical care aligns with best practices and evidence-based standards, leading to improved health outcomes (JCAHO, 2020).

Best Practices: Implementing best practices in quality management requires a multidisciplinary approach that integrates the expertise of pharmacists, physicians, nurses, and other healthcare professionals. Effective communication among healthcare team members is crucial for coordinating care and preventing errors. Comprehensive documentation, including detailed patient records and medication histories, supports continuity of care and facilitates accurate decision-making (O'Daniel et al., 2008). The use of electronic health records (EHRs) has become a standard practice in modern healthcare, enhancing the quality of pharmaceutical care through improved data accessibility, accuracy, and communication (Topol, 2019). EHRs allow healthcare providers to quickly access patient information, track medication histories, and identify potential drug interactions, thereby reducing the risk of medication errors. Continuous education and training for healthcare staff are essential to maintain high-quality standards in pharmaceutical care. Regular training programs help staff stay updated on the latest clinical guidelines, best practices, and technological advancements, ensuring they are well-equipped to provide optimal care (ASHP, 2013).

Challenges: Despite the existence of robust quality management frameworks, several challenges impede the effective implementation of quality management in pharmaceutical care. Resource limitations, such as staffing shortages and budget constraints, are significant barriers that can affect the quality of care (Ogbonna et al., 2015). These limitations can lead to increased workloads, burnout, and reduced attention to detail, all of which can compromise patient safety. Variations in regulatory environments and healthcare practices across different regions further complicate the standardization of quality management practices. Differences in regulations, standards, and cultural attitudes towards healthcare can result in inconsistent quality of care and difficulties in implementing uniform quality management systems (ISO, 2015).

Case Studies: Case studies of successful quality management initiatives provide valuable insights into practical applications and outcomes. For instance, a hospital that implemented a Six Sigma

quality improvement project reported significant reductions in medication errors and improved patient satisfaction (Harry & Schroeder, 2000). Another case study highlighted the benefits of integrating clinical pharmacists into multidisciplinary care teams, resulting in better medication management and patient outcomes in cardiovascular disease management (Carter et al., 2016).

Opportunities: The adoption of advanced technologies offers significant opportunities for enhancing quality management in pharmaceutical care. Artificial intelligence (AI) and machine learning can be used to analyze large datasets, identify patterns, and predict potential issues before they arise, thereby improving medication safety and patient outcomes (Vora et al., 2023). These technologies can also streamline administrative tasks, allowing healthcare professionals to focus more on patient care. Fostering a culture of continuous improvement and collaboration among healthcare professionals is another key opportunity for enhancing quality management. Encouraging open communication, regular feedback, and teamwork can lead to innovative solutions and improvements in care delivery (Deming, 1986). Additionally, involving patients in the quality management process through education and engagement initiatives can enhance their understanding of medication therapy and improve adherence to treatment plans (Marzbanet al., 2022).

Critical Analysis

Strengths: The current quality management practices in pharmaceutical care services exhibit several strengths. One of the most significant strengths is the existence of comprehensive guidelines and standards provided by regulatory bodies such as the International Organization for Standardization (ISO), the Joint Commission on Accreditation of Healthcare Organizations (JCAHO), and national agencies like the FDA and EMA (ISO, 2015; JCAHO, 2020; FDA, 2018; EMA, 2019). These standards ensure that pharmaceutical services adhere to high-quality benchmarks, promoting patient safety and effective medication management. Another strength is the integration of multidisciplinary teams in the delivery of pharmaceutical care. The collaboration between pharmacists, physicians, nurses, and other healthcare professionals enhances the quality of care through effective communication and coordination (Baetselieret al., 2021). Additionally, the implementation of electronic health records (EHRs) has significantly improved data accessibility, accuracy, and overall healthcare delivery (Topol, 2019).

Weaknesses: Despite these strengths, several weaknesses persist in the current quality management practices. Resource limitations, such as staffing shortages and budget constraints, often hinder the consistent application of quality management systems (Wiedenmayer et al., 2006). These limitations can lead to increased workloads and reduced attention to detail, which may compromise patient safety and the overall quality of care. Another notable weakness is the variability in regulatory environments and healthcare practices across different regions. This inconsistency can complicate the standardization of quality management practices, leading to disparities in care quality (Young, 2022). Furthermore, the reliance on traditional methodologies and resistance to adopting advanced technologies can limit the effectiveness of quality improvement initiatives (Topol, 2019).

Opportunities: There are numerous opportunities for enhancing quality management in pharmaceutical care. The adoption of advanced technologies, such as artificial intelligence (AI) and machine learning, presents significant potential for improving medication safety and patient outcomes (Topol, 2019). These technologies can analyze large datasets, identify patterns, and predict potential issues before they arise, thus enhancing the efficiency and effectiveness of quality management systems. Fostering a culture of continuous improvement and collaboration among healthcare professionals is another crucial opportunity. Encouraging open communication, regular feedback, and teamwork can lead to innovative solutions and improvements in care delivery (Deming, 1986). Additionally, involving patients in the quality management process through education and engagement initiatives can enhance their understanding of medication therapy and improve adherence to treatment plans (Hughes, 2008).

Threats: Several threats pose challenges to maintaining high-quality standards in pharmaceutical care services. One significant threat is the rapidly evolving nature of the healthcare and pharmaceutical industries. New medications, technologies, and treatment protocols are continually being developed, requiring ongoing adaptation and innovation in quality management practices (ASHP, 2013). Failure to keep pace with these changes can result in outdated practices and compromised care quality. Another threat is the potential for regulatory changes that may impact the implementation and enforcement of quality standards. Shifts in healthcare policies and regulations can create uncertainty and disrupt established quality management systems (FDA, 2018). Additionally, economic pressures and budget cuts can lead to reduced resources for quality improvement initiatives, further exacerbating existing challenges (kruk et al., 2018).

METHODOLOGY

Research Design: This critical review employs a systematic approach to evaluate the quality management practices in pharmaceutical care services. The research design includes a comprehensive literature review, analysis of regulatory frameworks, and examination of case studies to provide a holistic understanding of the current state of quality management in the field.

Data Sources: The data for this review were collected from a variety of sources, including academic journals, industry reports, and regulatory documents. Key databases such as PubMed, Scopus, and Google Scholar were searched for relevant articles using keywords like "pharmaceutical care," "quality management," "healthcare services," and "patient safety." Additionally, official websites of regulatory bodies like the FDA, EMA, ISO, and JCAHO were reviewed for current guidelines and standards.

Search Strategy: The search strategy involved identifying and selecting relevant studies published within the last two decades to ensure the inclusion of up-to-date information. Boolean operators and specific inclusion/exclusion criteria were applied to refine the search results. Inclusion criteria encompassed peer-reviewed articles, guidelines, and reports focusing on quality management in pharmaceutical care. Studies not available in English or lacking a focus on pharmaceutical care quality management were excluded.

Data Extraction: Data extraction was conducted systematically to ensure consistency and accuracy. Information was gathered on various aspects of quality management, including quality indicators, best practices, methodologies, and regulatory frameworks. Key details, such as study objectives, methodologies, findings, and recommendations, were extracted and organized thematically.

Analysis Techniques: The analysis involved both qualitative and quantitative techniques. Qualitative analysis was used to identify common themes, strengths, weaknesses, opportunities, and threats in the existing quality management practices. This included coding and categorizing the extracted data to identify patterns and draw meaningful insights. Quantitative data, such as medication error rates and patient satisfaction scores, were analyzed using descriptive statistics to provide a numerical representation of the quality indicators.

Ethical Considerations: Ethical considerations were adhered to by ensuring that all sources of data were properly cited and that the review did not involve any primary data collection from human subjects. The review focused on analyzing existing literature and secondary data, maintaining the integrity and credibility of the research process.

Limitations: The review acknowledges certain limitations, including potential publication bias and the exclusion of non-English studies, which might limit the generalizability of the findings. Additionally, the rapidly evolving nature of healthcare practices means that some of the information might become outdated quickly. Despite these limitations, the review provides a comprehensive evaluation of quality management practices in pharmaceutical care services.

DISCUSSION

Findings: This review highlights several critical aspects of quality management in pharmaceutical care services. The findings underscore the importance of robust regulatory frameworks and comprehensive quality standards in ensuring high-quality pharmaceutical care. Regulatory bodies like the FDA, EMA, ISO, and JCAHO play pivotal roles in setting and enforcing these standards, which contribute to patient safety, effective medication management, and overall healthcare efficiency (ISO, 2015; JCAHO, 2020; FDA, 2018; EMA, 2019). The review also emphasizes the value of multidisciplinary collaboration in enhancing the quality of pharmaceutical care. Effective communication and coordination among healthcare professionals, including pharmacists, physicians, and nurses, are essential for preventing errors and optimizing patient outcomes (Rahayuet al., 2021). The integration of electronic health records (EHRs) further supports these efforts by improving data accessibility and accuracy (Topol, 2019).

Implications for Practice: The findings of this review have several implications for practice. Firstly, healthcare organizations should prioritize the implementation of comprehensive quality management systems that adhere to established standards and guidelines. This includes regular training and education programs to ensure that healthcare professionals are equipped with the latest knowledge and skills. Secondly, fostering a culture of continuous improvement and collaboration is crucial. Healthcare organizations should encourage open communication, teamwork, and regular feedback to identify and address areas for improvement. This collaborative approach can lead to innovative solutions and enhanced care delivery. Additionally, the adoption of advanced technologies, such as AI and machine learning, can significantly improve quality management in pharmaceutical care. These technologies can analyze large datasets, identify patterns, and predict potential issues, thereby enhancing medication safety and patient outcomes (Topol, 2019). Healthcare organizations should invest in these technologies and integrate them into their quality management practices.

Future Research: Future research should focus on exploring the impact of advanced technologies on quality management in pharmaceutical care. Studies investigating the use of AI and machine learning in predicting and preventing medication errors, improving patient outcomes, and streamlining administrative tasks would provide valuable insights. Additionally, research on the implementation of standardized quality management practices across different regions and healthcare settings could help address the variability in regulatory environments and healthcare practices (Wiedenmayer et al., 2006). Further investigation into the barriers to effective quality management, such as resource limitations and resistance to change, is also necessary. Understanding these challenges can inform the development of strategies to overcome them and enhance the overall quality of pharmaceutical care services.

In conclusion, quality management is a critical component of pharmaceutical care services, essential for ensuring patient safety, effective medication management, and overall healthcare efficiency. While significant strengths exist in the current practices, including robust regulatory frameworks and multidisciplinary collaboration, challenges such as resource limitations and variability in regulatory environments persist. The adoption of advanced technologies and the fostering of a culture of continuous improvement and collaboration present significant opportunities for enhancing quality management. Future research should focus on leveraging these opportunities and addressing existing challenges to further improve the quality of pharmaceutical care services.

CONCLUSION

Quality management in pharmaceutical care services is paramount for ensuring patient safety, optimizing medication outcomes, and enhancing overall healthcare efficiency. This critical review has explored the current state of quality management practices, standards, and regulatory frameworks, highlighting both the strengths and challenges faced by healthcare providers.Regulatory bodies such as the FDA, EMA, ISO, and JCAHO play a crucial role in setting and enforcing high-quality standards, contributing to the reliability and effectiveness of pharmaceutical services. The integration of multidisciplinary teams and the use of electronic health records (EHRs) have been identified as significant strengths that support effective communication, coordination, and data management. However, several challenges persist, including resource limitations, variability in regulatory environments, and resistance to adopting advanced technologies. These challenges can hinder the consistent application of quality management practices and compromise patient safety. Opportunities for improvement include the adoption of advanced technologies such as artificial intelligence (AI) and machine learning, which have the potential to enhance medication safety and patient outcomes by predicting and preventing issues before they arise. Additionally, fostering a culture of continuous improvement and collaboration among healthcare professionals can drive innovation and improve care delivery. Future research should focus on the impact of these advanced technologies on quality management, exploring ways to standardize practices across different regions and healthcare settings, and addressing barriers to effective quality management. In conclusion, while significant progress has been made in the quality management of pharmaceutical care services, continuous efforts are needed to address existing challenges and leverage new opportunities. By prioritizing quality management and embracing innovation, healthcare providers can ensure the highest standards of pharmaceutical care, ultimately leading to better patient outcomes and a more efficient healthcare system.

REFERENCES

Albabtain, B., Hadi, M. A., Bawazeer, G., Alqahtani, A., Bahatheq, A., Alhossan, A., & Cheema, E. 2021. Evaluation of a community pharmacy-based medication therapy management programme: A study protocol of a pilot randomized controlled trial with an embedded qualitative study. *Saudi Pharmaceutical Journal: SPJ* : the official publication of the Saudi Pharmaceutical Society, 29(7), 706–712. https://doi.org/10.1016/j.jsps.2021.05.001

ASHP. 2013. ASHP guidelines on the pharmacy and therapeutics committee and the formulary system. American Journal of Health-System Pharmacy, 70(2), 109-123.

Carter, B. L., Rogers, M., Daly, J., Zheng, S., & James, P. A. 2016. The effectiveness of clinical pharmacist interventions in cardiovascular disease: A systematic review and meta-analysis. *Journal of the American College of Clinical Pharmacy*, 1(2), 21-35.

De Baetselier, Elyne & Dilles, Tinne & Batalha, Luis & Dijkstra, Nienke & Fernandes, Maria & Filov, Izabela & Friedrichs, Juliane & Grøndahl, Vigdis & Heczkova, Jana & Helgesen, Ann & Jordan, Sue & Keeley, Sarah & Klatt, Thomas & Kolovos, Petros & Kulirova, Veronika & Licen, Sabina & Lillo Crespo, Manuel & Malara, Alba & Padyšáková, Hana & Van Rompaey, Bart. (2021). Perspectives of nurses' role in interprofessional pharmaceutical care across 14 European countries: A qualitative study in pharmacists, physicians and nurses. PLOS ONE. 16. e0251982. 10.1371/journal.pone.0251982.

Deming, W. E. (1986). Out of the Crisis. MIT Press.

Donabedian, A. (1988). The quality of care: How can it be assessed? JAMA, 260(12), 1743-1748.

EMA. (2019). European Medicines Agency. Quality management guidelines. Retrieved from https://www.ema.europa.eu/

FDA. (2018). U.S. Food and Drug Administration. Quality management principles. Retrieved from https://www.fda.gov/

Harry, M., & Schroeder, R. (2000). Six Sigma: The Breakthrough Management Strategy Revolutionizing the World's Top Corporations. Doubleday.

Hepler, C. D., & Strand, L. M. (1990). Opportunities and responsibilities in pharmaceutical care. *American Journal of Health-System Pharmacy*, 47(3), 533-543.

Hughes RG. Tools and Strategies for Quality Improvement and Patient Safety. In: Hughes RG, editor. Patient Safety and Quality: An Evidence-Based Handbook for Nurses. Rockville (MD): Agency for Healthcare Research and Quality (US); 2008 Apr. Chapter 44. Available from: https://www.ncbi.nlm.nih.gov/books/NBK2682/

ISO. (2015). International Organization for Standardization. Quality management systems — Requirements (ISO 9001:2015). Geneva, Switzerland.

JCAHO. (2020). Joint Commission on Accreditation of Healthcare Organizations. Standards for quality management. Retrieved from https://www.jointcommission.org/

Juran, J. M. 1999. Juran's Quality Handbook. McGraw-Hill.

Kruk, M. E., Gage, A. D., Arsenault, C., Jordan, K., Leslie, H. H., Roder-DeWan, S., Adeyi, O., Barker, P., Daelmans, B., Doubova, S. V., English, M., García-Elorrio, E., Guanais, F., Gureje, O., Hirschhorn, L. R., Jiang, L., Kelley, E., Lemango, E. T., Liljestrand, J., Malata, A., … Pate, M. (2018). High-quality health systems in the Sustainable Development Goals era: time for a revolution. The Lancet. Global health, 6(11), e1196–e1252. https://doi.org/10.1016/S2214-109X(18)30386-3

Marzban, S., Najafi, M., Agolli, A., & Ashrafi, E. 2022. Impact of Patient Engagement on Healthcare Quality: A Scoping Review. *Journal of patient experience,* 9, 23743735221125439. https://doi.org/10.1177/23743735221125439

Nelson, S. D., Poikonen, J., Reese, T., El Halta, D., & Weir, C. (2017). The pharmacist and the EHR. Journal of the American Medical Informatics Association : JAMIA, 24(1), 193–197. https://doi.org/10.1093/jamia/ocw044

O'Daniel M, Rosenstein AH. Professional Communication and Team Collaboration. In: Hughes RG, editor. Patient Safety and Quality: An Evidence-Based Handbook for Nurses. Rockville (MD): Agency for Healthcare Research and Quality (US); 2008 Apr. Chapter 33. Available from: https://www.ncbi.nlm.nih.gov/books/NBK2637/

Ogbonna, B. O., Ezenduka, C. C., Soni, J. S., & Oparah, A. C. 2015. Limitations to the dynamics of pharmaceutical care practice among community pharmacists in Enugu urban, southeast Nigeria. *Integrated pharmacy research & practice*, 4, 49–55. https://doi.org/10.2147/IPRP.S82911

Rahayu, S. A., Widianto, S., Defi, I. R., & Abdulah, R. 2021. Role of Pharmacists in the Interprofessional Care Team for Patients with Chronic Diseases. *Journal of multidisciplinary healthcare,* 14, 1701–1710. https://doi.org/10.2147/JMDH.S309938

Topol, E. 2019. Deep Medicine: How Artificial Intelligence Can Make Healthcare Human Again. Basic Books.

Vora, L. K., Gholap, A. D., Jetha, K., Thakur, R. R. S., Solanki, H. K., & Chavda, V. P. 2023. Artificial Intelligence in Pharmaceutical Technology and Drug Delivery Design. Pharmaceutics, 15(7), 1916. https://doi.org/10.3390/pharmaceutics15071916

Wiedenmayer, K., Summers, R. S., Mackie, C. A., Gous, A. G., Everard, M., & Tromp, D. 2006. Developing pharmacy practice: A focus on patient care. World Health Organization.

Young M, Smith MA. Standards and Evaluation of Healthcare Quality, Safety, and Person-Centered Care. [Updated 2022 Dec 13]. In: StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2024 Jan-. Available from: https://www.ncbi.nlm.nih.gov/books/NBK576432/

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