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Medication Safety and Risk Reduction: Collaborative Roles of Pharmacy, Public Health, and Nursing

Khalid Yahya Mohammed Almagadi[1], Abdullah Mushabib Salman Jalaad[2], Mansour Saeed Mohammed Alqahtani[3], Saeed Saad Saeed Al Toman[4], Ali Mohammed Ahmd Al Ben Essa[5], Ali Mohammed Alalkami[6], Ali Ahmed Mohammed Falqe[7], Abdulaziz Defayr Alasiri[8], Debsa Aiyd Alqahtani[9], Abdullah Ahmed Abdullah Naji[10]

[1] Nursing Technician, Vector Borne and Zoonotic Diseases - Aseer Region
[2] Public Health Technician, Vector Borne and Zoonotic Diseases - Aseer Region
[3] Nursing Health Assistant, Vector Borne and Zoonotic Diseases - Aseer Region
[4] Nursing Technician, Rayda Al Jaliha Health Center - Abha Aseer
[5] Nursing Technician, Medical Supply Management - Abha Aseer
[6] Pharmacist, Medical Supply Management - Abha Aseer
[7] OR Technician, Medical Supply Management - Abha Aseer
[8] Pharmacist Technician, Medical Supply Management - Abha Aseer
[9] Nursing Technician, Almanhal Health Center - Abha Aseer
[10] Pharmacy Technician, Medical Supply Management - Abha Aseer

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ABSTRACT
Safety medication is cardinal in health care since medication errors might be associated with considerable side effects on the patients. The problem is multilevel because it will require incorporating various disciplines like pharmacy, public health, and nursing in seeking novelty methods of enhancing medication safety and reducing some of the medication-related risks. Pharmacy, public health, and nursing professionals can work toward designing a safer active medication use system based on their distinctive expertise in approaches such as multidisciplinary communication, technology adoption, engaging the patients, policy development, and continuous quality improvement. The bottom line from the article is that all parties need to pledge on matters involving the safety of the patients, while further collaboration shall be called for to overcome various emerging challenges and ultimately improve health outcomes.

Keywords: medication safety, risk reduction, interprofessional practice, pharmacy, nursing.

INTRODUCTION

The safety of medication is a priority in public health since medication error could entail adverse patient outcomes such as adverse drug events, hospitalization, and even death. In the United States, at least one death every day and about 1.3 million people get injured due to medication errors (Al-Worafi, 2020). Therefore, the problem requires comprehensive attention from various professions, including pharmacy, public health, and nursing. Each discipline contributes unique perspectives and skills that, when integrated effectively, can significantly enhance patient safety and reduce the risks associated with medication use (Schepel et al., 2019).

With this in place, pharmacists would definitely play the role of centrality in facilitating proper and safe medication use at each available healthcare setting. This would include reviewing the appropriateness of prescribed prescriptions, medication reconciliation, patient education on proper medication use, monitoring for potential adverse drug reactions, and utilization of technologies that minimize errors. This was an assertion by Agrawal, 2009; Mekonnen et al., 2016; Sanii et al., 2016. These professionals are concerned with ensuring that the population intervenes in medication safety through policy development, surveillance and analysis of data, community education, and then stakeholder involvement in the implementation of large-scale programs. Draws bases from Budnitz et al. 2011; Dowell et al. 2016; Kadri, 2020.

Nurses stay in their role - critical in the delivery of medications and educating the patient about them. Nurses serve as the "last check" before medications actually reach the patients. Nurses are expected to have rigorous safety practice, monitor patient's closely for both therapeutic responses and adverse reactions, ensure patient's needs are heard, and educate the patient and significant others on safe medication management. Benner et al., 2016; Grissinger, 2010. Pharmacy, public health, and nursing professionals can work in collaboration by implementing interdisciplinary communication, joint training programs, safety initiatives, and engaging patients

in the development of a safer healthcare system that gives priority to medication safety through all stages of the medication use process. This view is supported by Dingley et al. (2008) and Mansur (2016).

METHODOLOGY

It tends to grasp literature that informs about the collaborative roles of pharmacy, public health, and nursing in medication safety and risk reduction associated with the use of medications. Searches were done in databases like PubMed, Google Scholar, and Scopus for studies between 2010 and 2023. Key search terms included "medication safety," "pharmacy role," "public health interventions," "nursing practices," "interdisciplinary collaboration," and "risk reduction in medication errors."

Initial searches identified 320 articles. After removing the duplicates, screening titles, and abstracts for relevance to the topic, 104 articles entered full-text review. The inclusion criteria included studies conducted in healthcare or public health settings; the strategies in medication safety had to involve those skills and professions in pharmacy, public health, and nursing. There was also a group of excluded papers: papers not written in English, those that did not address an interprofessional approach, and those that address unrelated safety topics.

A total of 42 studies were analyzed that cumulatively met the inclusion criteria. These included randomized controlled trials, cohort studies, qualitative analyses, systematic reviews, and expert consensus papers. Data extraction then focused on collaborative approaches, technology adoption, patient engagement strategies, policy development, and outcomes representing the reduction of medication error and adverse drug events. Results of this nature had been synthesized in a systematic way to comprehensively outline the interdisciplinary practices and their impacts on medication safety.

LITERATURE REVIEW

An extensive literature review was carried out to find evidence of collaborative roles played by pharmacy, public health, and nursing in medication safety and risk mitigation. Searches of PubMed, Scopus, and Embase databases with the help of "interdisciplinary collaboration," "medication safety," "pharmacist roles in safety," "public health policies on medication use," and "nursing and patient safety" have been used. The identification of more studies was possible through a manual search of the references of key articles.

Inclusion criteria targeted all original research, systematic reviews, and expert guidelines published in peer-reviewed journals between 2010 and 2023. Studies that talk about only one professional role without collaboration, or unrelated to medication safety, or not focused on human populations, would be excluded. Results: Totally 42 studies screened for qualitative synthesis.

Of the studies reviewed, many highlighted an interdisciplinary collaborative approach as key to the improvement of patient safety with medication. Medicating reconciliation by pharmacists, the use of enabling technologies like clinical decision support systems, and the education of patients were identified. Interventions in public health make vital contributions in reducing risks at a population level, ensuring policy changes, and providing improved safe access to medicines. They were instrumental in medication safety, patient monitoring, and education on adherence to prescribed regimens.

strategies discussed to enable improvement included shared training programs, antimicrobial stewardship, and creating shared electronic health records so that communications are improved and errors are reduced. Technological changes proposed included barcode scanning and automated dispensing, associated with greater safety and reduced harm from medication errors. The barriers identified included resource constraints and resistance from organizational cultures; however, despite the challenges, there was strong support for a growing climate of safety via continuous quality improvement and nonpunitive error reporting systems.

On the whole, there is an emphasis on how medication safety really is a multidisciplinary affair which maximally exploits the varied strengths of pharmacy, public health, and nursing toward optimal outcomes. Further research will refine the collaboration protocols and take up the emergent challenge of the Medication Use System.

DISCUSSION

1. Collaborative Medication Safety Improvement Strategies

These three professions are significant stakeholders and partners in all three-dimensional issues relating to safety medicines. This type of collaboration can be made possible through continuous interdisciplinary communication via multi-disciplinary meetings that review medication safety incidents and devise a mutual action plan for them (Dingley et al. 2008). Similarly, coordination and documentation by healthcare providers can also be enhanced with the help of a mutual EHR (Dingley et al. 2008). Joint training and education programs are another important approach, as they help ensure a consistent understanding of medication safety protocols and best practices across disciplines (Mansur, 2016). By conducting workshops, conferences, and online courses, professionals can share knowledge and foster continuous learning and improvement (Mansur, 2016).

Of course, collaboration in safety improvement initiatives is another critical point in the optimization of medication use with minimized risks. For example, pharmacist-led antimicrobial stewardship programs, by nurses and for public health experts, can help in combating antibiotic resistance and improving patient outcomes (Kadri, 2020). In the same way, protocols can be developed for high-risk medications, such as anticoagulants or opioids, which minimize adverse events when all three disciplines work together in collaboration (Schiff et al., 2015). Collaborative research and quality improvement projects are also vital for advancing evidence-based practices and driving system-wide changes to enhance medication safety (Bates et al., 2018).

2. Reducing Medication Errors with Technology

Another important strategy to reduce medication errors and improve safety is to promote the implementation of technology. Pharmacists represent one of the major leaders in the implementation of CDSS, which alerts the provider about potential drug interactions, allergies, or dosing errors (Agrawal, 2009). They also champion electronic prescribing to minimize transcription errors and improve accuracy related to medication orders (Agrawal, 2009). Public health initiatives go a long way in facilitating mass dispersal of such technologies to further facilitate these technologies in promoting medication safety Ash et al. (2004).

For this reason, nurses also employ technology to improve safety in medication administration. They utilize barcode scanning systems to verify the "five rights" of medication administration-right patient, drug, dose, route, and time-and smart infusion pumps to ensure accurate dosing (Shah et al., 2016). The automated dispensing cabinets in health care help in inventory management, reducing dispensing errors, and tracking the usage of medication (Pedersen et al., 2014). Nurses can contribute by embracing such technologies and also by advocating their introduction in creating a medication use environment with minimal risk.

3. Engaging Patients and Communities for Medication Safety

The engagement of patients and the community is another important approach to improving medication safety. Medication safety is partly improved by pharmacists engaging in patient education, counseling on the correct administration, adverse events, and compliance behavior. They tailor their advice to meet the particular needs of various populations, such as pediatric, geriatric, or pregnant patients (Sanii et al., 2016). Public health professionals fill in the gaps with the organization of community outreach programs to increase awareness about medication safety, including risks associated with self-medication or counterfeit drugs (Ratzan, 2011). They also work on improving health literacy, especially among the most at-risk populations, empowering those individuals to make better informed decisions about their use of medications (Ratzan, 2011).

Nurses, as patient advocates, play a crucial role in encouraging patients to actively participate in their care by asking questions and reporting side effects (Benner et al., 2016). They educate patients and caregivers about medication management, including proper storage, administration techniques, and recognizing adverse reactions (Bodenheimer et al., 2002). For patients with chronic conditions, nurses are instrumental in promoting adherence to prescribed regimens, helping to improve long-term health outcomes (Bodenheimer et al., 2002). By collaborating with pharmacists and public health professionals, nurses can contribute to comprehensive patient education initiatives that empower individuals to take an active role in ensuring medication safety.

4. Using Policy and Regulation to Improve Medication Safety

The professional has a major role in policy development and legislative functions that could help in advancing medication safety at the population levels. They worked on informing specific guidelines for safe prescribing practice, such as guidelines on opioid prescribing from CDC (Dowell et al., 2016). Support policies that would promote access to affordable medicines. Public health experts also collaborate with policymakers to implement mandatory adverse drug reaction reporting systems and safe medication disposal programs, helping to reduce the risk of medication misuse and environmental contamination (Kinrys et al., 2016).

All these efforts are furthered by pharmacists and nurses: persons with direct experiences related to medication safety challenges avail pragmatic implications of proposed policy. They can indicate unforeseen consequences and suggest modifications that will make regulations both effective and feasible to be implemented in the real world. By working together with public health professionals and policymakers, pharmacists and nurses can help advocate for policies that prioritize patient safety and improvement of medication use outcomes.

5. Continuous Quality Improvement and Medication Safety Culture

The medication safety culture should continue to drive the quality improvement effort. The obligation shall be one of the responsibilities within the realm of the pharmacy, public health, and nursing concerning leadership priorities, resource allocation, ongoing education, training, and enhancements to systems. Support open communications and a nonpunitive response to error reporting to identify and resolve quickly any safety concern. By analyzing medication error data and conducting root cause analyses, healthcare organizations can develop targeted interventions to prevent future incidents (Flynn et al., 2012).

Interdisciplinary collaboration is vital for creating a strong medication safety culture. Pharmacists, public health

professionals, and nurses must work together to establish shared goals, develop standardized protocols, and promote accountability at all levels. Regular safety huddles, multidisciplinary rounds, and quality improvement committees provide opportunities for ongoing collaboration and problem-solving (Kennelty et al., 2015). By fostering a culture of continuous learning and improvement, healthcare organizations can proactively address medication safety challenges and adapt to emerging risks.

CONCLUSION

Medication safety is everyone's concern, thus it calls for collaboration among the pharmacy, public health, and nursing disciplines. Each brings special expertise and perspectives that, when combined in an effective way, can substantially reduce the risk of medication errors and adverse drug events. Strategies involving interdisciplinary communication, combined training programs, use of technology, engaging the patient, policy development, and continuous quality improvement can move these professions in unison to bring about a safer system of medication use.

The ultimate goal of all efforts in medication safety is the protection of the patient from being harmed and ensuring the highest realization of benefit from the treatment. Using the pharmacy-public health-nursing synergies, healthcare organizations will be able to build a stronger and more responsive system that makes the safety of patients the number one priority in each stage of the medication use process. By professions making such professions, through ongoing collaboration, innovation, and continuous improvement, major jumps forward in the reduction of medication-related risks can be achieved to realize best health outcomes for patients and communities.

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