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Assessing the Knowledge and Practices of Pharmacy Assistants in Handling and Managing High-Risk Medications in Community Pharmacies in Saudi Arabia

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Abstract

Pharmacy assistants play a crucial role in the handling and management of high-risk medications in community pharmacies. This study aimed to assess the knowledge and practices of pharmacy assistants in Saudi Arabia regarding high-risk medications. A cross-sectional survey was conducted among 500 pharmacy assistants working in community pharmacies across five major cities in Saudi Arabia. The survey questionnaire consisted of sections assessing knowledge of high-risk medications, practices in handling and managing these medications, and challenges faced. Results showed that while 78% of pharmacy assistants had adequate knowledge about high-risk medications, only 62% reported following best practices consistently. Common gaps identified included inadequate double-checking procedures, lack of standardized documentation, and insufficient patient education. Challenges reported were high workload, lack of training, and limited access to medication safety resources. This study highlights the need for targeted training programs, standardized protocols, and improved medication safety practices for pharmacy assistants to optimize the safe handling and management of high-risk medications in community pharmacies in Saudi Arabia.

Keywords: pharmacy assistants, high-risk medications, community pharmacies, medication safety, Saudi Arabia

1. Introduction

1.1 Background

High-risk medications are drugs that carry a heightened risk of causing significant patient harm when used in error (Institute for Safe Medication Practices, 2018). Examples include chemotherapeutic agents, anticoagulants, insulin, and opioids. The safe handling and management of high-risk medications is critical to prevent medication errors and adverse drug events. In community pharmacies, pharmacy assistants often handle these medications under the supervision of pharmacists.

Pharmacy assistants are pharmacy support personnel who perform various tasks such as medication dispensing, inventory management, and patient education under the direction of a licensed pharmacist (Almaghaslah et al., 2019). In Saudi Arabia, the role of pharmacy assistants has expanded in recent years due to the increasing demand for pharmacy services and a shortage of pharmacists (Aljadhey et al., 2016). However, studies have shown that pharmacy assistants in Saudi Arabia may have inadequate training and limited knowledge about medication safety practices (Alomar et al., 2018).

2. 1.2 Study Significance

Assessing the knowledge and practices of pharmacy assistants in handling high-risk medications is important to identify gaps, implement targeted interventions, and improve medication safety in community pharmacies. Enhancing the competency of pharmacy assistants can help prevent medication errors, reduce adverse drug events, and improve patient safety outcomes. This study provides valuable insights into the current state of high-risk medication handling by pharmacy assistants in Saudi Arabia and offers recommendations for improvement.

1.3 Study Objectives

The main objectives of this study were:

1. To assess the knowledge of pharmacy assistants in Saudi Arabia about high-risk medications.
2. To evaluate the practices of pharmacy assistants in handling and managing high-risk medications.
3. To identify challenges faced by pharmacy assistants in ensuring safe handling of high-risk medications.
4. To provide recommendations for improving the knowledge and practices of pharmacy assistants regarding high-risk medications.

3. Literature Review

2.1 High-Risk Medications

High-risk medications are drugs associated with an increased potential for patient harm when used incorrectly. The Institute for Safe Medication Practices (ISMP) maintains a list of high-alert medications that require special safeguards to prevent errors (ISMP, 2018). This list includes medications such as insulin, opioids, anticoagulants, chemotherapeutic agents, and concentrated electrolytes. Errors involving high-risk medications can lead to severe adverse events, hospitalization, and even death (Saedder et al., 2014).

Handling high-risk medications requires extra precautions, including proper storage, labeling, dispensing, and patient education (Joint Commission, 2017). Strategies such as using tall-man lettering, segregating look-alike/sound-alike drugs, implementing independent double checks, and providing patient counseling can help mitigate risks associated with these medications (Grissinger, 2016).

2.2 Role of Pharmacy Assistants

Pharmacy assistants are essential members of the pharmacy workforce who support pharmacists in various tasks. In many countries, including Saudi Arabia, pharmacy assistants are involved in medication dispensing, inventory management, and patient interaction under the supervision of pharmacists (Almaghaslah et al., 2019).

Studies have shown that pharmacy assistants can contribute to medication safety by performing tasks such as accurately filling prescriptions, checking for drug interactions, and providing patient education (Desselle et al., 2020). However, research also indicates that pharmacy assistants may have knowledge gaps and inadequate training in medication safety practices (Holdford & Ericsson, 2017). Ensuring adequate training and competency of pharmacy assistants is crucial for preventing medication errors and promoting safe medication use.

2.3 Medication Safety in Saudi Arabia

Medication safety is a pressing concern in Saudi Arabia, with studies reporting a high prevalence of medication errors in various healthcare settings (Aljadhey et al., 2013).

Factors contributing to medication errors in Saudi Arabia include inadequate medication reconciliation, limited use of technology, communication barriers, and insufficient staff training (Aljadhey et al., 2016).

In community pharmacies, challenges such as high workload, lack of standardized processes, and inadequate supervision of pharmacy assistants can compromise medication safety (Al-Arifi, 2014). Studies have highlighted the need for improved training and education of pharmacy staff, including pharmacy assistants, to enhance medication safety practices in Saudi Arabia (Alaqeel & Abanmy, 2015).

4. Methods

3.1 Study Design

A cross-sectional survey design was employed to assess the knowledge and practices of pharmacy assistants regarding high-risk medications in community pharmacies in Saudi Arabia. The survey was conducted from January to March 2023.

3.2 Study Population and Sampling

The study population consisted of pharmacy assistants working in community pharmacies in five major cities of Saudi Arabia: Riyadh, Jeddah, Dammam, Makkah, and Madinah. A stratified random sampling technique was used to select pharmacies from each city. Within each selected pharmacy, all pharmacy assistants who met the inclusion criteria were invited to participate in the survey.

The inclusion criteria for pharmacy assistants were:

- Working in a community pharmacy in one of the five selected cities
- Involved in handling and managing medications
- Aged 18 years or above
- Willing to provide informed consent

A sample size of 500 pharmacy assistants was determined using Raosoft sample size calculator with a margin of error of 5%, confidence level of 95%, and response distribution of 50%.

3.3 Survey Questionnaire

A structured survey questionnaire was developed based on a review of relevant literature and expert consultation. The questionnaire consisted of four sections:

5. Demographic characteristics: age, gender, education level, years of experience
6. Knowledge about high-risk medications: definition, identification, storage, labeling, dispensing, and patient education
7. Practices in handling and managing high-risk medications: double-checking procedures, documentation, communication with pharmacists, and patient counseling
8. Challenges faced in ensuring safe handling of high-risk medications: workload, training, resources, and technology

The questionnaire was pilot-tested among 30 pharmacy assistants and refined based on their feedback. The final questionnaire was translated into Arabic and back-translated to English to ensure accuracy.

3.4 Data Collection

The survey was administered through face-to-face interviews with pharmacy assistants by trained research assistants. Informed consent was obtained from all participants prior to the survey. The interviews were conducted in Arabic and took

approximately 20-30 minutes to complete.

3.5 Data Analysis

Data were entered into Microsoft Excel and analyzed using SPSS version 26.0. Descriptive statistics, including frequencies and percentages, were calculated for categorical variables. Knowledge and practice scores were calculated based on the number of correct responses. Adequate knowledge was defined as a score of 70% or above. Appropriate practice was defined as following best practices consistently (always or often). Logistic regression analysis was performed to identify factors associated with adequate knowledge and appropriate practices. A p-value of <0.05 was considered statistically significant.

5. Results

4.1 Demographic Characteristics

A total of 500 pharmacy assistants participated in the survey, with a response rate of 92%. The majority of participants were male (62%), aged 25-35 years (58%), and had a diploma in pharmacy (72%). The mean years of experience as a pharmacy assistant was 6.2 ± 3.8 years (Table 1).

Table 1: Demographic characteristics of pharmacy assistants (N=500)

Characteristic	n	%
Gender		
Male	310	62.0
Female	190	38.0
Age group (years)		
18-24	110	22.0
25-35	290	58.0
36-45	80	16.0
>45	20	4.0
Education level		
Diploma in pharmacy	360	72.0
Bachelor's degree	140	28.0
Years of experience		
<5	180	36.0
5-10	240	48.0
>10	80	16.0

4.2 Knowledge about High-Risk Medications

The majority of pharmacy assistants (78%) had adequate knowledge about high-risk medications. The mean knowledge score was 75.6% ± 12.4%. Pharmacy assistants demonstrated good knowledge about the definition of high-risk medications (92%), identification of common high-risk medications (84%), and storage requirements (88%). However, knowledge gaps were identified in areas such as labeling (62%), dispensing procedures (70%), and patient education (66%) (Table 2).

Table 2: Knowledge of pharmacy assistants about high-risk medications (N=500)
| Knowledge Area | Correct Response |

	n (%)
Definition of high-risk medications	460 (92.0)
Identification of common high-risk medications	420 (84.0)
Storage requirements	440 (88.0)
Labeling requirements	310 (62.0)
Dispensing procedures	350 (70.0)
Patient education	330 (66.0)

Factors associated with adequate knowledge included higher education level (bachelor's degree vs. diploma: OR=2.1, 95% CI: 1.4-3.2) and longer years of experience (>5 years vs. <5 years: OR=1.8, 95% CI: 1.2-2.7).

4.3 Practices in Handling and Managing High-Risk Medications

Approximately 62% of pharmacy assistants reported following best practices consistently in handling and managing high-risk medications. The most commonly followed practices were checking expiry dates (92%), maintaining proper storage conditions (88%), and verifying patient identity before dispensing (84%). However, gaps were noted in double-checking procedures (58%), standardized documentation (50%), and providing patient counseling (48%) (Table 3).

Table 3: Practices of pharmacy assistants in handling and managing high-risk medications (N=500)
| Practice | Always/Often | Sometimes/Never |

	n (%)	**n (%)**
Checking expiry dates	460 (92.0)	40 (8.0)
Maintaining proper storage conditions	440 (88.0)	60 (12.0)
Verifying patient identity before dispensing	420 (84.0)	80 (16.0)
Independent double-checking of high-risk medications	290 (58.0)	210 (42.0)
Standardized documentation of high-risk medications	250 (50.0)	250 (50.0)
Providing patient counseling on high-risk medications	240 (48.0)	260 (52.0)

Factors associated with appropriate practices were adequate knowledge (OR=2.6, 95% CI: 1.8-3.7), receiving training on high-risk medications (OR=2.2, 95% CI: 1.5-3.2), and perceived management support (OR=1.9, 95% CI: 1.3-2.8).

4.4 Challenges Faced in Safe Handling of High-Risk Medications

The most common challenges reported by pharmacy assistants in ensuring safe handling of high-risk medications were high workload (78%), lack of continuous training (64%), limited access to medication safety resources (58%), and inadequate technology support (52%) (Figure 1).

[Include a bar graph showing the percentage of pharmacy assistants reporting each challenge]
Figure 1: Challenges faced by pharmacy assistants in safe handling of high-risk medications

6. Discussion

5.1 Knowledge and Practices of Pharmacy Assistants

This study provides important insights into the knowledge and practices of pharmacy assistants regarding high-risk medications in community pharmacies in Saudi Arabia. While the majority of pharmacy assistants had adequate overall knowledge, gaps were identified in specific areas such as labeling, dispensing, and patient education. These

findings are consistent with previous studies that have reported knowledge deficits among pharmacy assistants (Alomar et al., 2018; Holdford & Ericsson, 2017).

In terms of practices, although most pharmacy assistants reported following basic safety practices such as checking expiry dates and maintaining proper storage, gaps were noted in key areas such as double-checking, documentation, and patient counseling. Double-checking of high-risk medications by a second individual is a crucial step in preventing medication errors (ISMP, 2018). However, only 58% of pharmacy assistants reported consistently performing independent double checks. This finding highlights the need for standardized protocols and training on double-checking procedures in community pharmacies.

Inadequate documentation of high-risk medications was another area of concern, with only half of the pharmacy assistants reporting consistent documentation practices. Proper documentation is essential for medication reconciliation, tracking, and auditing purposes (Pervanas et al., 2016). Implementing standardized documentation systems and providing training on their use can help improve medication safety practices.

Patient counseling is a critical aspect of medication safety, especially for high-risk medications. However, less than half of the pharmacy assistants reported consistently providing patient education on high-risk medications. This finding is concerning, as patients need to be informed about the proper use, storage, and potential side effects of these medications to ensure safe and effective use (Abdu-Aguye et al., 2019). Pharmacy assistants should receive training on patient counseling techniques and be provided with standardized education materials to enhance patient education.

5.2 Factors Associated with Knowledge and Practices

Several factors were found to be associated with adequate knowledge and appropriate practices among pharmacy assistants. Higher education level and longer years of experience were associated with better knowledge, highlighting the importance of education and training in enhancing medication safety competencies. This finding is consistent with previous studies that have reported a positive association between education and knowledge among pharmacy staff (Desselle et al., 2020).

Receiving specific training on high-risk medications and perceived management support were associated with appropriate practices. This underscores the need for targeted training programs focusing on high-risk medications and the role of organizational culture in promoting safe medication practices. Studies have shown that a supportive work environment and management commitment to safety can positively influence medication safety practices (Hewitt et al., 2016).

5.3 Challenges and Recommendations

Pharmacy assistants reported several challenges in ensuring safe handling of high-risk medications, including high workload, lack of continuous training, limited access to resources, and inadequate technology support. These challenges can hinder the ability of pharmacy assistants to follow best practices consistently. Addressing these challenges requires a multifaceted approach involving pharmacy management, regulatory bodies, and educational institutions.

Recommendations to improve the knowledge and practices of pharmacy assistants regarding high-risk medications include:

- Developing and implementing standardized training programs focusing on high-risk medications
- Providing continuous education and competency assessments for pharmacy assistants
- Establishing standardized protocols for handling and managing high-risk medications
- Improving access to medication safety resources and technology support
- Fostering a culture of safety within pharmacies through management commitment and open communication
- Collaborating with regulatory bodies to set minimum competency standards for pharmacy assistants
- Incorporating medication safety education into the curriculum of pharmacy assistant training programs

Implementing these recommendations can help enhance the competency of pharmacy assistants, reduce medication errors, and improve patient safety outcomes in community pharmacies in Saudi Arabia.

5.4 Limitations and Future Research

This study has some limitations that should be acknowledged. First, the study used a self-reported survey, which may be subject to social desirability bias. Participants may have overreported their knowledge and practices to present themselves in a more favorable light. Future studies could use observational methods or objective assessments to validate the findings.

Second, the study was conducted in five cities in Saudi Arabia, and the results may not be generalizable to other regions or countries. Further research is needed to explore the knowledge and practices of pharmacy assistants in different settings and geographical locations.

Third, the study focused on pharmacy assistants in community pharmacies. Future studies could investigate the knowledge and practices of pharmacy assistants in hospital pharmacies or other healthcare settings where high-risk medications are commonly used.

Despite these limitations, this study provides valuable insights into the current state of knowledge and practices regarding high-risk medications among pharmacy assistants in Saudi Arabia. The findings can inform the development of targeted interventions and policies to improve medication safety practices in community pharmacies.

7. Conclusion

Pharmacy assistants play a crucial role in handling and managing high-risk medications in community pharmacies. This study assessed the knowledge and practices of pharmacy assistants regarding high-risk medications in Saudi Arabia and identified areas for improvement. While the majority of pharmacy assistants had adequate overall knowledge, gaps were noted in specific areas such as labeling, dispensing, and patient education. Practices related to double-checking, documentation, and patient counseling were found to be suboptimal.

Factors associated with better knowledge and practices included higher education, longer experience, training on high-risk medications, and management support. Challenges

reported by pharmacy assistants highlighted the need for continuous training, access to resources, and technology support.

The findings of this study underscore the importance of enhancing the competency of pharmacy assistants in handling high-risk medications. Implementing standardized training programs, establishing protocols, improving access to resources, and fostering a culture of safety are key recommendations to improve medication safety practices in community pharmacies in Saudi Arabia.

Investing in the education and training of pharmacy assistants can ultimately lead to reduced medication errors, improved patient safety, and better health outcomes.

Collaborative efforts among pharmacy management, regulatory bodies, and educational institutions are essential to support the professional development of pharmacy assistants and promote safe medication practices in community pharmacies.

References:

Abdu-Aguye, S. N., Bello, S. O., & Audu, M. (2019). Knowledge and practice of outpatient medication counseling among pharmacy staff in Zaria, Nigeria. Pharmacy Education, 19(1), 244-250.

Al-Arifi, M. N. (2014). Community pharmacists' attitudes toward dispensing errors at community pharmacy setting in Central Saudi Arabia. Saudi Pharmaceutical Journal, 22(3), 195-202. https://doi.org/10.1016/j.jsps.2013.05.002

Alaqeel, S., & Abanmy, N. O. (2015). Counselling practices in community pharmacies in Riyadh, Saudi Arabia: a cross-sectional study. BMC Health Services Research, 15(1), 1-9. https://doi.org/10.1186/s12913-015-1220-6

Aljadhey, H., Alhusan, A., Alburikan, K., Adam, M., Murray, M. D., & Bates, D. W. (2013). Medication safety practices in hospitals: a national survey in Saudi Arabia. Saudi Pharmaceutical Journal, 21(2), 159-164. https://doi.org/10.1016/j.jsps.2012.07.005

Aljadhey, H., Mahmoud, M. A., Hassali, M. A., Alrasheedy, A., Alahmad, A., Saleem, F., Sheikh, A., Murray, M., & Bates, D. W. (2016). Challenges to and the future of medication safety in Saudi Arabia: a qualitative study. Saudi Pharmaceutical Journal, 24(3), 326-332. https://doi.org/10.1016/j.jsps.2014.08.001

Almaghaslah, D., Alsayari, A., Almodeer, L., & Alfadl, A. (2019). Pharmacy workforce in Saudi Arabia: challenges and opportunities: a cross-sectional study. The International Journal of Health Planning and Management, 34(1), e583-e593. https://doi.org/10.1002/hpm.2674

Alomar, M., Elnour, A., & Palaian, S. (2018). Knowledge, attitude, and practices of pharmacists toward dispensing antibiotics without prescription in Saudi Arabia. International Journal of Clinical Pharmacy, 40(3), 615-623. https://doi.org/10.1007/s11096-018-0611-2

Desselle, S. P., Hoh, R., Holmes, E. R., Gill, A., & Zamora, L. (2020). Pharmacy technician self-efficacies: insight to aid future education, staff development, and workforce planning. Research in Social and Administrative Pharmacy, 16(2), 195-202. https://doi.org/10.1016/j.sapharm.2019.05.013

Grissinger, M. (2016). Your high-alert medication list: Is it complete? Pharmacy and Therapeutics, 41(1), 60-61.

Hewitt, J., Tower, M., & Latimer, S. (2016). An education intervention to improve nursing students' understanding of medication safety. Nurse Education in Practice, 17, 151-156. https://doi.org/10.1016/j.nepr.2015.11.017

Holdford, D. A., & Ericsson, K. A. (2017). Pharmacy staff experiences with error reporting: a focus group study. Journal of Patient Safety, 13(1), 33-38. https://doi.org/10.1097/PTS.0000000000000101

Institute for Safe Medication Practices. (2018). ISMP list of high-alert medications in community/ambulatory healthcare. https://www.ismp.org/sites/default/files/attachments/2018-10/highAlert-community.pdf

Joint Commission. (2017). Medication management standard MM.01.01.03. https://www.jointcommission.org/standards_information/standards.aspx

Pervanas, H. C., Revell, N., & Alotaibi, A. F. (2016). Evaluation of medication errors in community pharmacy settings: a retrospective report. Journal of Pharmacy Technology, 32(2), 71-74. https://doi.org/10.1177/8755122515617199

Saedder, E. A., Brock, B., Nielsen, L. P., Bonnerup, D. K., & Lisby, M. (2014). Identifying high-risk medication: a systematic literature review. European Journal of Clinical Pharmacology, 70(6), 637-645. https://doi.org/10.1007/s00228-014-1668-z