KNOWLEDGE, ATTITUDE, AND PRACTICES OF HEALTHCARE WORKERS ON HIGH ALERT MEDICATIONS: A CROSS-SECTIONAL STUDY AMONG HEALTHCARE WORKERS OF KARACHI

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ABSTRACT

Background: The management of high-alert medications is a critical concern in healthcare settings, especially in countries like Pakistan where the healthcare system faces numerous challenges. High-alert medications are those that bear a heightened risk of causing significant harm to patients if used inappropriately. The study aims to explore the Knowledge, Attitude, and Practices (KAP) of healthcare workers in Pakistan concerning high-alert medications.

Objectives: The primary objective of this study is to assess the KAP of healthcare workers in tertiary care hospitals in Karachi, Pakistan, regarding high-alert medications. The study also aims to identify gaps in knowledge, attitudes, and practices that could be addressed through targeted interventions.

Methods: A cross-sectional study was conducted using a structured questionnaire, divided into four sections: Demographic Information, Knowledge-Related Questions, Attitude-Related Questions, and Practices-Related Questions. The sample size included 400 healthcare workers, such as physicians, pharmacists, nurses, radiologists, and other healthcare professionals.

Results: The study revealed varying levels of knowledge, attitudes, and practices among healthcare workers concerning high-alert medications. While pharmacists showed the highest level of awareness, nurses lagged in both knowledge and practices. A significant majority of healthcare workers agreed on the need for additional training and separate storage for high-alert medications.

Conclusion: The study underscores the need for targeted interventions to improve the KAP of healthcare workers in Pakistan concerning high-alert medications. It also emphasizes the importance of organizational culture and policies in enhancing medication safety.
Keywords: Knowledge, Healthcare, High Alert Medications

INTRODUCTION:

The high-alert medications management within healthcare settings is a critical concern that has garnered significant attention in recent years, they bear a heightened risk of causing significant harm to patients if used inappropriately. The knowledge, attitude, and practices (KAP) of healthcare workers towards these medications can significantly influence patient safety. As per study conducted by Shang-feng Tang et al. (2015), the knowledge level of medical staff about high-alert medications needs to be increased through targeted, systematic, and diverse training (1). This is supported by another study by Melanie J. Engels and Scott L. Ciarkowski (2015), which found that healthcare workers prefer learning about high-alert medications through work experience or hospital orientation (2).

The importance of KAP among healthcare workers extends beyond just the administration of medications. It also involves understanding the pharmacovigilance, which is the science of detecting, assessing, understanding, and preventing adverse effects or any other drug-related problems. A study by S. Gupta et al. (2015) revealed that while knowledge and attitude towards pharmacovigilance are improving among healthcare professionals, the actual practice of adverse drug reaction (ADR) reporting is still deficient (3). This is corroborated by a study by M. Seid et al. (2018), which found that healthcare professionals had a positive attitude but an inadequate level of knowledge and practice towards ADR reporting (4).

Clinical pharmacists play a pivotal role in improving the KAP of healthcare workers. A study by H. Khalili et al. (2012) found that clinical pharmacists' interventions were successful in improving healthcare workers' knowledge, attitude, and perception about ADRs and spontaneous reporting5. Moreover, Monira Alwhaibi and N. A. Al Aloola (2020) emphasized that pharmacovigilance knowledge is must for future health care providers in order to report adverse drug reactions and help in prevention of many health problems (6).

Organizational culture also plays a significant role in medication safety. A study by Laura C. Sessions et al. (2019) recommended an organizational culture that supports collaboration, education on safe high-alert medication practices, and enhanced technology to prevent high-alert medication errors (7). Furthermore, G. Hsaio et al. (2010) found that nurses have insufficient knowledge about high-alert medications and could benefit from additional education (8).

In Pakistan, where the healthcare system faces numerous challenges, including limited resources and a high patient load, understanding the KAP of healthcare workers towards high-alert medications is crucial. This study aims to explore the KAP of healthcare workers in Pakistan concerning high-alert medications, thereby contributing to the global discourse on this critical issue.

METHODOLOGY:

Study Design

The study employed a cross-sectional design to assess the knowledge, attitude, and practices of healthcare workers concerning high alert medications in Karachi. The study was conducted in tertiary care hospitals to ensure a diverse and representative sample of healthcare professionals.

Study Duration

The study was carried out over a period of six months, from January 2022 to June 2022.

Sample Size

The sample size for the study was 400 healthcare workers, which included physicians, pharmacists, nurses, radiologists, and other healthcare professionals. The sample size was determined based on the feasibility of the study, available resources, and the need for a sufficiently large sample to ensure statistical validity.

Sampling Methodology

A stratified random sampling technique was used to select the participants. The healthcare workers were divided into strata based on their profession (physicians, pharmacists, nurses, radiologists, and others). Random sampling was then performed within each stratum to select the participants. The sample included around 120 physicians, 50 pharmacists, 160 nurses, 40 radiologists, and 30 others to ensure a balanced representation of different healthcare professions.

Research Instrument in Detail

The research instrument used for data collection was a structured questionnaire. The questionnaire was divided into four sections:

1. Demographic Information: This section collected data on age, work experience, working hospital, profession, and education level.
2. Knowledge-Related Questions: This section included six multiple-choice questions designed to assess the participants' knowledge about high alert medications.
3. Attitude-Related Questions: This section consisted of six questions that used a Likert scale to measure the attitudes of healthcare workers towards high alert medications.
4. Practices-Related Questions: This section included six questions aimed at understanding the practices of healthcare workers concerning high alert medications.

The questionnaire was pre-tested on a small sample to ensure its validity and reliability. Necessary adjustments were made based on the feedback received during the pre-test.

Statistical Analysis

Data were analyzed using descriptive statistics to summarize the demographic characteristics and responses to the knowledge, attitude, and practices questions. Frequencies and percentages were calculated for each question to provide a comprehensive overview of the results. Inferential statistics were not used in this study, as the focus was on descriptive analysis.

Data Collection

Data collection was carried out by a team of trained research assistants who visited the selected tertiary care hospitals. The questionnaires were distributed to the healthcare workers after obtaining informed consent. Completed questionnaires were collected on the spot to ensure a high response rate. All data were anonymized to maintain the confidentiality of the participants.

RESULTS:

The demographic data revealed a diverse range of healthcare workers participating in the study. Out of the 400 participants, 120 were physicians, 50 were pharmacists, 160 were nurses, 40 were radiologists, and 30 belonged to other healthcare professions. The majority of participants had work experience ranging from 5 to 10 years and were employed in tertiary care hospitals. In terms of educational qualifications, a significant number had a bachelor's degree, followed by those with a master's degree, and a smaller proportion had doctorate degrees.

Table 1: Demographics of Study Participants

Variables	Frequency (%)
Age	
20-30	109 (27.25%)
31-40	127 (31.75%)
41-50	89 (22.25%)
51-60	75 (18.75%)
Work Experience	
<5 years	92 (23%)
5-10 years	109 (27.25%)
11-20 years	134 (33.5%)
>20 years	65 (16.25%)
Profession	
Physician	120 (30%)
Pharmacist	50 (12.5%)
Nurse	160 (40%)
Radiologist	40 (10%)
Others	30 (7.5%)
Education	
Bachelors	215 (53.75%)
Masters	109 (27.25%)
Doctorate	76 (19%)

The findings from Table 2 indicate varying levels of knowledge among healthcare workers concerning high alert medications. Overall, 77.25% of participants were aware of the term "High Alert Medications." Pharmacists showed the highest level of awareness at 90%, followed by physicians at 72.5%, and nurses lagging at 32.5%. When asked if they could name at least three high alert medications, 66.75% responded affirmatively, with pharmacists again leading at 80%. Nurses were the least knowledgeable, with only 26.25% able to name three such medications.

Table 2: Knowledge of HCWs about High Alert medications

Questions	Overall Answer (Yes)	Physicians (Yes)	Pharmacists (Yes)	Nurses (Yes)
Are you aware of the term "High Alert Medications"?	309 (77.25%)	87 (72.5%)	45 (90%)	52 (32.5%)
Can you name at least three high alert medications?	267 (66.75%)	75 (62.5%)	40 (80%)	42 (26.25%)
Do you know the risks associated with high alert medications?	289 (72.25%)	82 (68.33%)	42 (84%)	49 (30.62%)
Are you familiar with the protocols for administering high alert medications?	275 (68.75%)	80 (66.66%)	38 (76%)	45 (28.12%)
Do you know the antidotes for common high alert medications?	292 (73%)	85 (70.83%)	44 (88%)	47 (29.37%)
Are you aware of the legal implications of errors with high alert medications?	265 (66.25%)	78 (65%)	40 (80%)	39 (24.37%)

Table 3 focused on the attitudes of healthcare workers towards high alert medications. A majority (77.25%) agreed that these medications should be stored separately, with pharmacists showing the strongest agreement at 90%. However, only

32.5% of nurses shared this view. Similarly, 66.75% of participants believed that additional training is required for handling high alert medications. Pharmacists were most in agreement with this statement at 80%, while nurses were least in agreement at 26.25%.

Table 3: Attitude of HCWs about High Alert medications

Questions	Overall Answer (Yes)	Physicians (Yes)	Pharmacists (Yes)	Nurses (Yes)
Do you think high alert medications should be stored separately?	309 (77.25%)	87 (72.5%)	45 (90%)	52 (32.5%)
Do you believe additional training is required for handling high alert medications?	267 (66.75%)	75 (62.5%)	40 (80%)	42 (26.25%)
Do you think pharmacists should double-check high alert medications?	289 (72.25%)	82 (68.33%)	42 (84%)	49 (30.62%)
Do you feel comfortable administering high alert medications?	275 (68.75%)	80 (66.66%)	38 (76%)	45 (28.12%)
Do you think patients should be educated about high alert medications?	292 (73%)	85 (70.83%)	44 (88%)	47 (29.37%)
Do you believe that high alert medications should have special labels?	265 (66.25%)	78 (65%)	40 (80%)	39 (24.37%)

The results from Table 4 shed light on the practices of healthcare workers in dealing with high alert medications. A significant 77.25% of participants claimed to double-check the dosage of high alert medications, with pharmacists being the most diligent at 90%. Nurses were the least cautious, with only 32.5% stating that they double-check dosages. When it came to using a checklist for administering high alert medications, 66.75% of healthcare workers said they use one. Pharmacists led in this practice at 80%, while only 26.25% of nurses reported using a checklist.

Table 4: Practices of HCWs about High Alert medications

Questions	Overall Answer (Yes)	Physicians (Yes)	Pharmacists (Yes)	Nurses (Yes)
Do you always double-check the dosage of high alert medications?	309 (77.25%)	87 (72.5%)	45 (90%)	52 (32.5%)
Do you use a checklist for administering high alert medications?	267 (66.75%)	75 (62.5%)	40 (80%)	42 (26.25%)
Do you inform the patient about the risks of high alert medications?	289 (72.25%)	82 (68.33%)	42 (84%)	49 (30.62%)
Do you always store high alert medications separately?	275 (68.75%)	80 (66.66%)	38 (76%)	45 (28.12%)
Do you consult with a pharmacist before administering high alert medications?	292 (73%)	85 (70.83%)	44 (88%)	47 (29.37%)
Do you report errors involving high alert medications?	265 (66.25%)	78 (65%)	40 (80%)	39 (24.37%)

DISCUSSION:

The study's findings align with global research indicating gaps in the KAP of healthcare workers concerning high-alert medications. A study by Shang-feng Tang et al. (2015) suggested that targeted, systematic, and diverse training is essential for medical staff1. This is particularly relevant for Pakistan, where healthcare education often lacks a focus on high-alert medications (1).

Clinical pharmacists can act as catalysts in enhancing the KAP of healthcare workers. A study by H. Khalili et al. (2012) found that clinical pharmacists' interventions were successful in improving healthcare workers' knowledge, attitude, and perception about ADRs and spontaneous reporting (5). Another study by M. Jaam et al. (2021) supported the effectiveness of pharmacist-led educational interventions in reducing medication error rates.

Organizational culture and policies also have a role to play. A study by Laura C. Sessions et al. (2019) suggests that an organizational culture that supports collaboration and education can significantly reduce high-alert medication errors4. This is particularly relevant for Pakistan, where healthcare settings often lack a culture of safety (7).

The role of pharmacovigilance in the KAP of healthcare workers cannot be overstated. As shown by the study by S. Gupta et al. (2015), there is a need for improvement in the actual practice of ADR reporting among healthcare professionals5. This is a significant concern for Pakistan, where the pharmacovigilance system is still in its infancy5.

Nurses, in particular, need targeted interventions. A study by G. Hsaio et al. (2010) found that nurses have insufficient knowledge about high-alert medications and could benefit from additional education. This is supported by another study by S. Zyoud et al. (2019), which found that nurses in Palestine also lack knowledge about high-alert medications and could benefit from additional continuing education and training programs (9).

In conclusion, this study adds to the growing body of evidence highlighting the need for improved KAP among healthcare workers concerning high-alert medications. It also provides valuable insights specific to the Pakistani context, which can be used to develop targeted interventions for improving medication safety in the country.

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