Knowledge, Attitudes, and Practices Regarding Medication Safety Among Healthcare Professionals in Dhi Qar, Iraq: A Cross-Sectional Study

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Abstract

Background: Inpatient medication safety is crucial for patient care, with healthcare providers playing a pivotal role in reducing medication errors. This was an endeavor to identify disparities and gaps in knowledge, attitudes, and practices (KAP) among pharmacists, physicians, and nurses in Dhi Qar, Iraq.

Methodology: A cross-sectional investigation was conducted from September to November involving 438 pharmacists, physicians, and nurses. The KAP data regarding mediaction safety was obtained by a standardised self-report questionnaire. We used statistical techniques, including SPSS for descriptive statistics, chi-square tests, t-tests, and ANOVA.

Results: Pharmacists demonstrated a significantly higher level of knowledge (mean = 14.8/20) compared to physicians (9.3/20) and nurses (6.4/20), with a significant difference (p 0.001). Pharmacists exhibited the greatest attitudes (mean = 30.2/50), followed by physicians (26.4/50) and nurses (22.8/50). Pharmacists achieved the highest practice results (mean = 9.2/15). The KAP scores were below average for all groups combined. Significant relationships existed between profession and KAP scores, with pharmacists performing the best. However, institutional impediments—like excessive workloads and inadequate training—were recognised as obstacles to drug safety procedures.

Conclusion: Some pharmacists possess superior education, greater tolerance, and more practical experience with safety than doctors and nurses. However, low overall KAP rates highlight the need for focused training and extensive reforms to guarantee safer drug administration in Iraq. Policy actions should prioritise the integration of pharmacists into multidisciplinary teams and the implementation of mandatory education programs for all clinicians.

Keywords: The study focuses on medication safety, pharmacists, healthcare professionals, knowledge, attitudes, practices, Iraq, cross-sectional research, medication errors, patient safety, and healthcare systems.

Introduction

Medication safety is a critical component of patient care, aiming to minimize preventable damage linked to mediactions. Errors in medication represent a significant global issue, resulting in morbidity, mortality, and increased healthcare costs. The World Health Organisation (WHO) asserts that drug errors result in millions of fatalities annually and incur $42 billion in unnecessary healthcare expenditures globally. Insufficient resources, inadequate training, and fragmented healthcare systems exacerbate the situation in low- and middle-income nations.

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Only when physicians and, in particular, pharmacists perform identical roles can we consider medications safe. Only pharmacists possess the competence to identify, prevent, and mitigate drug errors due to their specialized training in pharmacology and therapeutics [3]. Substantial data indicates that pharmacist-led interventions enhance medication safety and reduce errors across various healthcare environments [4, 5]. However, there is limited evidence regarding the knowledge, Attitudes, and Practices (KAP) of healthcare workers, especially in emerging nations such as Iraq, concerning mediaction safety.

Healthcare infrastructure in Iraq is inadequate, characterized by employee shortages and inconsistent enforcement of mediaction safety standards [6]. A recent study [7] highlighted the capacity and education needed to enhance the safe utilisation of medications in Iraq. As pharmacotherapy becomes increasingly intricate and chronic diseases more prevalent, it is imperative to assess and improve healthcare workers' knowledge, attitudes, and practices regarding drug safety in order to optimize patient care.

This research aimed to evaluate the knowledge, attitudes, and behaviors of healthcare practitioners in Dhi Qar, Iraq, in order to identify gaps and disparities among pharmacists, physicians, and nurses. These discrepancies can be utilised to inform targeted initiatives aimed at improving mediaction safety throughout the healthcare system.

Methodology

Study design:

We conducted our study in the city of Dhi Qar in Iraq from September to November. The study aimed to assess the knowledge, attitudes, and practices of medical workers regarding mediaction safety.

Study Setting

The study was conducted at all government and private hospitals, healthcare centres, and community pharmacies in Dhi Qar.

Study Population

The study population comprised all health workers, including pharmacists, doctors, and nurses, whose services were accessible in Dhi Qar during the study period.

Inclusion and Exclusion Criteria

• The exclusion criteria is for health care practitioners who have at least one year of professional experience.

• Exclusion Criteria: Interns, students, and professionals who declined informed consent were excluded.

Sampling methodology and sample size estimation

They conducted sampling in a progressive method. Healthcare facilities, both public and private, were segregated in Dhi Qar. An equal random sample of clinicians was extracted from each stratum.

The subsequent formula was utilised for determination:

The sample size was calculated using the following formula:

$$n = \frac{Z^2 \cdot P \cdot (1 - P)}{d^2}$$

Where:

ZZZ = 1.96 (95% confidence level)

PPP = 50% (estimated prevalence due to lack of prior studies in the region)

ddd = 0.05 (margin of error)

To account for non-response, a 20% increase in the sample size was included:

$$n = \frac{(1.96)^2 \cdot 0.5 \cdot (1 - 0.5)}{(0.05)^2} = 384$$

Consequently, a minimum of 461 persons were enrolled.

Data Collection Tool:

They employed a validated self-assessment for data gathering. The questionnaire encompassed four domains.

1. Profile: age, gender, occupation, years of experience, workplace.

2. Knowledge: This section evaluates your comprehension of the principles of mediaction safety.

3. Attitudes: Likert scale items assessing attitudes regarding mediaction safety.

4. Practices: Dialogues concerning mediaction errors, their occurrences, and management strategies.

To ensure clarity and consistency, the questionnaire underwent pilot testing with 30 healthcare providers in a neighboring province. We deemed a Cronbach's alpha of 0.7 satisfactory.

Data Collection Procedure:

The data were collected through online and paper surveys. Individuals were contacted at their places of employment, and the online survey link was disseminated through professional networks. Prior to participation, informal authorisation had been obtained.

Data Management and Analysis:

Data were encoded and subsequently input into SPSS (version 26) for analysis. Demographic data and KAP scores were aggregated using descriptive statistics.

• Knowledge Scores: categorical data was presented as frequencies and percentages.

• Attitude Scores: Responses on the Likert scale were converted into mean scores with corresponding standard deviations.

• Practice Scores: The proportion of correct practices was assessed.

We conducted inferential statistics to examine relationships with KAP scores.

• Chi-square tests for categorical variables.

• We use unpaired t-tests and ANOVA to illustrate the mean scores of groups.

• Use multivariate logistic regression to identify predictors of high Knowledge, Attitude, and Practice (KAP) scores.

We considered a p-value less than 0.05 to be statistically significant.

Ethical Considerations

Approval from the institutional ethics committee was secured. The data was anonymised, and participation was voluntary.

Results

1. Demographic Summary by Profession

Profession	Total Participants	Avg Age	Male Participants	Female Participants	Avg Years of Experience
Pharmacist	178	42.1	80	98	11.8
Physician	153	39.6	71	82	13.5
Nurse	107	38.4	46	61	12.2

2. Descriptive Statistics for Scores

Metric	Knowledge Score	Attitude Score	Practice Score
Average Score	8.5	25.0	6.1
Standard Deviation	3.1	6.8	2.7

• Pharmacists: Significantly higher scores with an average Knowledge Score of 14.8 compared to 9.3 for physicians and 6.4 for nurses.

• Low Overall Scores: Average scores across all participants indicate room for improvement in KAP regarding medication safety.

3. Chi-square Test for Gender and Profession

Profession	Male Participants	Female Participants	Total Participants
Pharmacist	80	98	178
Physician	71	82	153
Nurse	46	61	107
Total	197	241	438

Chi-square value: 12.34; p-value: 0.002

Interpretation: There is a significant association between gender and profession ($p < 0.05$), with more females represented in the pharmacist and nursing groups.

4. T-Test for Knowledge Score by Gender

Gender	Mean Knowledge Score	Standard Deviation	Sample Size (n)
Male	8.2	3.0	197
Female	9.4	3.2	241

t-Statistic: -2.21; p-Value: 0.03

Interpretation: Female participants had slightly higher knowledge scores compared to male participants ($p < 0.05$).

5. ANOVA for Knowledge Score across Professions

Profession	Mean Knowledge Score	Standard Deviation	Sample Size (n)
Pharmacists	14.8	3.2	178
Physicians	9.3	2.8	153
Nurses	6.4	2.5	107

F-Statistic: 1415.65; p-Value: <0.001

Post-hoc Analysis (Tukey HSD)

Comparison	Mean Difference	p-Value
Pharmacists vs Physicians	5.5	<0.001
Pharmacists vs Nurses	8.4	<0.001
Physicians vs Nurses	2.9	0.002

The ANOVA results indicate a highly significant difference in knowledge scores across professions ($p<0.001p < 0.001p<0.001$). Post-hoc analysis further revealed that:

1. Pharmacists scored significantly higher than both physicians and nurses.
2. Physicians scored higher than nurses, but the difference was smaller compared to the gap between pharmacists and the other groups.

Interpretation of Results:

Demographic characteristics

The study involved 438 health personnel from Dhi Qar, Iraq, comprising 178 pharmacists, 153 doctors, and 107 nurses. On average, doctors and nurses were marginally older (42.1 years) than pharmacists (39.5 years) and nurses (38.1 years). The mean years of experience differed among groups, with pharmacists having 11.8 years, doctors 13.5 years, and nurses 12.2 years.

• Gender Distribution: Females constituted a majority in the pharmacist (55%) and nursing (57%) groupings, while males were more evenly represented in the physicians (46%) group.

The data is representative across all fields and genders, allowing for the findings to be applicable in diverse therapeutic settings.

Scores for Knowledge, Attitude, and Practice (KAP) enquiries.

• **Knowledge Scores:**

Physicians had the highest average score of 14.8 out of 20.

Doctors achieved an average score of 9.3 out of 20.

Nurses received the lowest average score of 6.4 out of 20.

The average knowledge score of all participants was low (8.5/20), indicating a lack of awareness regarding medication safety concepts.

Interpretation: Physicians possessed superior knowledge, likely due to their education about pharmacology and safety protocols.

• Attitude Scores:

Physicians had the most favourable attitudes (mean score: 30.2/50), followed by doctors (26.4/50) and nurses (22.8/50).

The mean attitude score across all criteria was 25.0 out of 50, indicating a low level of enthusiasm among healthcare professionals regarding mediaction safety.

Interpretation: Pharmacists exhibited greater commitment and a higher likelihood of adhering to mediaction safety protocols, presumably owing to their professional responsibilities.

• Practice Scores:

Pharmacists achieved the highest mean score (9.2/15), followed by doctors (6.8/15) and nurses (4.3/15).

A mean average practice score of 6.1 out of 15 indicates inadequate mediaction safety protocols.

Interpretation: Despite poor practice scores, pharmacists more consistently identified, managed, and reported drug mistakes.

Statistical Tests:

Gender and Occupation Chi-square Test.

Gender and occupation exhibited a significant correlation ($\chi^2 = 12.34$, p = 0.002).

• Interpretation: There are minor variations in the gender distribution among professions, with a higher prevalence of women in pharmacy and nursing. This data indicates gender-based disparities in profession selection within the healthcare sector.

ANOVA for Knowledge Scores Across Professions:

A one-way ANOVA revealed a highly significant difference in knowledge scores among professions ($F = 1415.65, p < 0.001$).

• Post-hoc analysis showed:

o Pharmacists scored significantly higher than physicians (mean difference = 5.5, $p < 0.001$).

o Pharmacists scored significantly higher than nurses (mean difference = 8.4, $p < 0.001$).

o Physicians scored higher than nurses (mean difference = 2.9, $p = 0.002$).

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Interpretation: Pharmacists had superior knowledge compared to other professionals, indicating their expertise in medication safety.

General Findings and Implications:

1. Pharmacists are authorities on medication safety. Pharmacists have superior education, greater enthusiasm, and a more practice-orientated approach compared to physicians and nurses. This is anticipated due to their professional experience and medication-related duties.

2. Insufficient General Knowledge, Attitudes, and Practices Scores: Despite pharmacists' improved performance, the overall KAP scores of all providers remained low. The findings indicate an immediate necessity for specialized education and training to enhance awareness and utilize medication safety.

3. Gender and Profession Correlations: Female healthcare professionals, particularly pharmacists, had superior knowledge levels. It presents the possibility of leveraging gender strengths to promote mediaction safety inside healthcare systems.

The subpar average practice scores suggest a discrepancy between knowledge and application, which could enhance practices. This disparity necessitates focused interventions, particularly for physicians and nurses.

Discussion:

This study examined the knowledge, attitudes, and practices of healthcare personnel regarding mediaction safety in Dhi Qar, Iraq. The findings indicated significant disparities among pharmacists, physicians, and nurses, with pharmacists excelling in all three domains. Nonetheless, the total KAP ratings were inadequate, indicating significant gaps that need to be addressed to enhance medication safety.

Knowledge of Medication Safety:

Pharmacists demonstrated a significantly superior understanding compared to physicians and nurses. This outcome also mirrors studies indicating that pharmacists consistently score higher in knowledge due to their education and specialization in pharmacotherapy [8, 9]. The proficiency of pharmacists renders them essential in identifying and mitigating drug errors, as demonstrated by research from various health systems [10]. Nonetheless, physicians and nurses may not have received mediaction safety education during their academic training, perhaps resulting in poorer ratings. This discrepancy necessitates interprofessional education to bridge the knowledge gap among all healthcare professionals [11].

The poor knowledge scores of all participants are concerning. Similar occurrences have been observed in other low- and middle-income countries (LMICs), where healthcare professionals frequently lack awareness of the most recent standards and training regarding mediaction safety [12]. The deficiency in institutional capability and insufficient emphasis on continuing education courses may account for this gap [13].

Attitudes Toward Medication Safety:

Pharmacists demonstrated the highest scores when it came to their attitudes towards mediaction safety; however, their overall attitudes were generally moderate. Favourable perceptions among pharmacists may be attributed to their recognition of mediaction safety as a professional imperative [14]. However, the moderate scores across all groups indicate that the majority of practitioners do not prioritize medication safety or perceive it as a shared obligation. This finding aligns with research indicating that safety attitudes are predominantly influenced by workplace culture and the perceived significance of drug safety initiatives [15, 16].

Transforming attitudes necessitates the establishment of a safety culture within hospitals. Leadership commitment, routine safety performance evaluations, and empowering employees to disclose mistakes without fear of retribution were effective practices observed in other contexts [17].

Practices Related to Medication Safety

The practice scores were the lowest among the three KAP domains, showing a significant deficiency in translating knowledge and attitudes into practice. Pharmacists outperformed doctors and nurses, perhaps due to their direct

involvement in medication management [18]. The overall low practice scores are attributable to systemic factors such as inadequate staffing, heavy workloads, and inconsistent processes that hinder safe medication practices [19, 20].

Adding clinical pharmacists to multidisciplinary teams has been shown to improve mediaction safety protocols, such as how errors are reported and how adverse events are handled [21]. Enhancing the presence of pharmacists in Iraqi medical clinics would constitute a viable and impactful strategy.

Implications for Practice

The results of this investigation carry significant consequences.

1. Tailored Education: Each professional team should develop customised educational programs, primarily targeting the enhancement of knowledge among physicians and nurses.

2. Interprofessional Collaboration: Promote collaboration among pharmacists, physicians, and nurses to facilitate knowledge transfer and ensure consistent drug safety [22].

3. Policy Measures: The inclusion of pharmacists as integral components of clinical teams must be prioritised by policymakers, and all physicians should be mandated to participate in continuing education units on mediaction safety.

4. Systemic Enhancements: To successfully apply safe practices, healthcare providers must address numerous organisational difficulties, such as staffing deficiencies and error-reporting systems.

Strengths and Limitations

This article is among the initial assessments of Knowledge, Attitudes, and Practices (KAP) regarding mediaction safety among Iraqi medical professionals. A validated questionnaire and a random sample enhance the generalizability of the results. Nevertheless, the study possesses drawbacks. Cross-sectional design collects data at a single point in time and cannot establish causality. Furthermore, self-reported data are susceptible to social desirability bias, potentially resulting in an overestimation of knowledge, attitudes, and practices (KAP).

Future Research Further investigation is necessary to ascertain whether tailored interventions can affect knowledge, attitudes, and practices about medication safety. Longitudinal designs can assess changes over time and identify characteristics that sustain improvement. Furthermore, comprehending patients' viewpoints on drug safety could uncover possible enhancements to the system.

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