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**RESEARCH ARTICLE**

# Assessing the Knowledge, Practices and Attitude of Nurses towards Adverse Drug Reaction Reporting Systems to Improve Quality of Care in a Tertiary Care Hospital in Islamabad, Pakistan

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**ABSTRACT**

The medication's safety is the main concern for healthcare organizations and patients. Adverse drug reactions are a major threat to patient safety and the quality of care.

The purpose of the study is to assess the level of knowledge, practices, and attitudes of nurses regarding ADR reporting systems along with the impact of patient safety culture in Shifa International Hospitals Ltd., Islamabad.

A cross-sectional descriptive study was conducted among nurses working in a tertiary care hospital in Islamabad. A structured questionnaire was used to collect data on four key areas: knowledge with current practices, attitudes towards adverse drug reactions reporting system, patient safety culture and quality of care. To analyze the data the SPSS software was used.

The results indicate that nurses at Shifa Hospital have good knowledge and practices regarding adverse drug reactions, with 56% encountering reactions and 82% of them reporting. However, over 53% lacked training on ADR reporting. Nurses showed a positive attitude, with over 92% acknowledging the importance of ADR reporting for patient safety and viewing it as a professional duty. The hospital has a strong patient safety culture, evidenced by 92% of nurses noting improved quality of care, a 90% reduction in family complaints, and a 92% decrease in medication errors.

The study assess the relationship between nurses' knowledge, practices, and attitudes towards adverse drug reaction reporting systems and patient safety culture in a Pakistani tertiary care hospital. It reveals that nurses understand the need for reporting, but there are gaps due to fear of legal implications, lack of information, and insufficient training. The study suggests that a strong patient safety culture, promoting open communication, non-punitive reporting, and shared responsibility, can improve nurses' reporting practices. It also emphasizes the importance of institutional support and nursing leadership in promoting safety culture.

## INTRODUCTION

Adverse drug reactions are harmful medication reaction which may not only worsen the patient's health condition but the whole treatment process, ranging from minor side effects to serious outcomes. According to the World Health Organization (WHO), Adverse Drug Reactions (ADRs)are harmful effects of medicines that are lethal, unplanned, and unintended outcome of the drug at a regular therapeutic dose (WHO, 2021). These adverse reactions have grown in to a major issue for the community of health as these reactions causes mortality and morbidity and the increased complexity of medication (Khalil & Huang, 2020). Furthermore, studies show that one out of ten admitted patients encounter a negative occurrence while they are in the hospital for treatment (Al-Mugheed et al., 2022; Khater et al., 2015). The adverse drug reactions might increase in number and be become tremendously hazardous due to insufficient reporting (Bethasari, 2023).

The motivation of healthcare professionals plays a key role for the effective reporting of adverse drug reactions and has become necessary in current healthcare setting (Nandal, Mahajan, Narwane, Kunkulol, & Baheti, 2019). A study revealed that 50.18% of nursing officers have unsatisfactory knowledge of reporting adverse drug reactions, persuaded by aspects like experience, gender, ICU work, and previous training. Hindrances including lacking in knowledge about reporting systems and apprehensions (Bankar, Tewari, & Kumar, 2023). According to a study conducted by Tekel, Bekalu, et al. (2021) in India, nurses' roles are important for reporting adverse drug reactions as they have direct interaction with patients throughout the medication course, however they have a minimal input and insufficient knowledge of adverse drug reactions (Tekel, Bekalu, Sema, & Practice, 2021). According to Salehi et al. (2021), nurses' practices are central in ADR reporting due to their direct role in patient care. The study shows that 53.6% of nurses had experience advising patients on ADRs, 67.1% had encountered patients with ADRs, but only 21.2% had experience in reporting ADRs (Salehi et al., 2021). Carayon et al. (2021) reported that hospital nurses occupy up to 30% of their time on medication administration and documentation. Technology has suggestively impacted nursing practice, predominantly in record keeping and medication administration (Carayon et al., 2021). Schutte et al. (2018) discussed the positive practice of oncology unit nurses in the management of adverse medications reactions. The oncology unit nurses are effectively reporting these reactions while documenting in clinical practice, demonstrating their readiness and commitment to pharmacovigilance (Schutte et al., 2018).

The delivery of quality of care with nurses' positive attitude certify the safety of patient and safety of procedure. With positive rational nurses are every time beholding for extraordinary nursing practice. However, evidence specifies that nurses who perceive their work simply as "just a job" are more committed to making medication errors (Vaismoradi et al., 2020). Research indicates that nurses exhibit a more positive attitude towards ADR reporting compared to their knowledge and practices in this area (Salehi et al., 2021). The study by Zewde (2020), describes that a large number of healthcare specialists are lacking the needed expertise and attitude for effective reporting of adverse drug reactions. For enhancement the reporting of adverse drug reactions, this has become essential to implement inclusive training and awareness courses (Zewde, 2020).

The World Health Organization WHO (2021) defines the patient safety that denotes to the formation of cultures, processes, procedures, behaviors, technologies, and atmospheres which constantly and sustainably decrease the risks, avoid harms, making mistakes less likely, and minimalize inaccuracy (Organization, 2021). A study was carried out at the Divisional Headquarters of the Hospital Mirpur Azad Jammu and Kashmir (AJK) that discovered the healthcare organization of Divisional Headquarters of the Hospital (AJK) showed the upgrading in facilities, but both quality and safety are still lacking. Improvements include supervisor/manager expectations, feedback, and communication about errors, which has shown high scores (Bashir et al., 2024). According to a study by Levine et al. (2020), which endorses that aspects alike organizational culture alongside with commitment, management openness, common affects, and reporting simplicity effect healthcare personnel's willingness to report medicine mistakes (Levine, Carmody, & Silk, 2020). In order to increase the prospect of patient safety issues becoming openly informed, the study suggests highlighting the development of incident feedback networks and the spreading of enhancements related to cases (Burlison et al., 2020). Another study by Berry et al. (2020) showed that an effective patient safety program reduces serious safety incidents and patient harm (Berry et al., 2020).

Adverse drug reactions (ADR) represent a significant patient safety concern after being recognized as major cause of morbidity and mortality in hospital admissions.(Patidar et al., 2013). This spontaneous reporting is considered as the most important feature of the system whereby the reports are submitted to the national reporting agency through the healthcare professionals and pharmaceutical manufacturers. These reports are then communicated to WHO pharmacovigilance center.

The objective of the study is to assess knowledge, practices and attitude of nurses towards adverse drug reaction reporting systems to improve quality of care in a tertiary care hospital in Islamabad, Pakistan

## METHODOLOGY

A cross-sectional study was conducted at a tertiary care hospital in Islamabad, Pakistan from May, 2024 to August, 2024collect data from 251 registered nurses selected through convenient sampling technique. Registered Nurses who were directly involved in patient care activities, including medication administration and monitoring for adverse reactions and having six-month experience were included in the study. Those who were on leave or temporarily assigned outside patient care areas during the study period were excluded from the study.

A structured questionnaire was designed using study objectives and a literature review. It included items rated on a 3-point Likert scale ("Yes," "Somewhat/Not encountered," "No") and a 5-point Likert scale ranging from "-1 (Strongly Disagree)" to "5 (Strongly Agree)." The questionnaire assessed nurses' knowledge, practices, attitudes, and patient safety culture related to adverse reaction reporting systems.

The eligible registered nurses working in critical care, medical, surgical, operation rooms and emergency units. Nurses were contacted via departmental heads, invited to participate via Google Forms and hard copies. Prior to data collection, ethical approval was obtained fromShifa International Hospital, Islamabad(IRB No. 194-24).Informed consent was obtained from all participants before their participation in the study. Participants were assured of the confidentiality and anonymity of their responses, and they were informed that their participation is voluntary.

To analyze the data SPSS software is used. The overall analysis such as regression, correlation, reliability, one way ANOVA and moderation is run to get the results.

## RESULTS

The table 1 shows demographic characteristics of the participants. Most of the participants were females (54.2%) and (45.8%) were male. a significant proportion of nurses belonged to younger age categories, specifically 45.4% aged 20-25 and 31.1% aged 26-30. As age increases, there is a remarkable decline in representation: 12.4% fall within the 31-35 age bracket, 4.4% within 36-40, and 6.8% are aged 41 and above. The major educational statistic is Graduation, with 66.1% of individuals having completed a Bachelor's degree. The majority of nurses (77.7%) have 1-5 years of experience.

**Table 1. Demographic characteristics of the participants**

| Variable | Characteristics | Frequency (percentage) |
|---|---|---|
| **Age** | 20-25 years | 114 (45.4) |
| | 26-30 years | 78 (31.1) |
| | 31-35 years | 31 (12.4) |
| | 36-40 years | 11 (4.4) |
| | 41 above years | 17 (6.8) |
| **Gender** | Male | 115 (45.8) |
| | Female | 136 (54.2) |
| **Education** | Intermediate | 79 (31.5) |
| | Graduation | 166 (66.1) |
| | Masters | 3 (1.2) |
| | MS/MPhil | 3 (1.2) |
| **Experience** | 1-5 years | 195 (77.7) |
| | 5-10 years | 30 (12) |
| | 10-15 years | 17 (6.8) |
| | 15-20 years | 3 (1.2) |
| | 20 and above | 6 (2.4) |

## Reliability Analysis

**Table 2. Reliabilities of the scales**

| Variables | Items | Cronbach Alpha | Remarks |
|---|---|---|---|
| Reporting Knowledge & Practices of Adverse Drug Reactions | 7 | 0.65 | Moderately Acceptable |
| Reporting Attitude about Adverse Drug Reactions | 9 | 0.78 | Acceptable |
| Patient Safety Culture | 10 | 0.89 | Good |
| Quality of Care | 5 | 0.78 | Acceptable |

The above reliability analysis table 2 offers valuable insights into the internal consistency of measurement scales across various constructs within healthcare. With Cronbach's Alpha coefficients value 0.65 shows the moderately reliable and weak internal consistency, while it is borderline acceptable level. With Cronbach's Alpha coefficients ranging from 0.78 to 0.89, the findings indicate high reliability and strong internal consistency of the questionnaire used in this study. This reliability supports its effectiveness in assessing attitudes towards adverse drug reactions, patient safety culture, and quality of care within healthcare settings. Liability was less than the acceptable level so 3 items were deleted from Reporting Knowledge & Practices, Reporting Attitude about Adverse Drug Reactions and 2 items were deleted from Patient Safety culture.

## One way ANOVA: Quality of care and Patient Safety culture by Demographics

**Table 3. QC and PSC by Gender**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| **Quality of Care** | Between Groups | 20.643 | 1 | 20.643 | 2.926 | .088 |
| | Within Groups | 1756.545 | 249 | 7.054 | | |
| | Total | 1777.187 | 250 | | | |
| **Patient safety culture** | Between Groups | 10.184 | 1 | 10.184 | .303 | .583 |
| | Within Groups | 8372.549 | 249 | 33.625 | | |
| | Total | 8382.733 | 250 | | | |

The One Way ANOVA analysis reveals that there are no statistically significant differences between genders in terms of the quality of care and patient safety culture. The p-values for both variables are greater than 0.05, suggesting that gender does not have a significant effect on these outcomes in the given sample.

For Quality of Care, $F(1, 249) = 2.926$, $p = .088$

For Patient Safety Culture, $F(1, 249) = 0.303$, $p = .583$

**Table 4. QC and PSC by Age**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| **Quality of care** | Between Groups | 20.616 | 4 | 5.154 | .722 | .578 |
| | Within Groups | 1756.571 | 246 | 7.141 | | |
| | Total | 1777.187 | 250 | | | |
| **Patient safety culture** | Between Groups | 133.178 | 4 | 33.295 | .993 | .412 |
| | Within Groups | 8249.555 | 246 | 33.535 | | |
| | Total | 8382.733 | 250 | | | |

The One Way ANOVA analysis reveals that there are no statistically significant differences between age groups in terms of the quality of care and patient safety culture. The p-values for both variables are greater than 0.05, suggesting that age does not have a significant effect on these outcomes in the given sample.

For Quality of Care, $F(4, 246) = 0.722$, $p = 0.578$

For Patient Safety Culture, $F(4, 246) = 0.993$, $p = 0.412$

**Table 5. QC and PSC by Qualifications**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| **Quality of care** | Between Groups | 15.043 | 3 | 5.014 | .703 | .551 |
| | Within Groups | 1762.144 | 247 | 7.134 | | |
| | Total | 1777.187 | 250 | | | |
| **Patient safety culture** | Between Groups | 49.427 | 3 | 16.476 | .488 | .691 |
| | Within Groups | 8333.306 | 247 | 33.738 | | |
| | Total | 8382.733 | 250 | | | |

The One Way ANOVA analysis reveals that there are no statistically significant differences between qualification groups in terms of the quality of care and patient safety culture. The p-values for both variables are greater than 0.05, suggesting that qualifications do not have a significant effect on these outcomes in the given sample.

For Quality of Care, $F(3, 247) = 0.703$, $p = 0.551$

For Patient Safety Culture, $F(3, 247) = 0.488$, $p = 0.691$

**Table 6. QC and PSC by Experience**

| | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| **Quality of care** | Between Groups | 16.190 | 5 | 3.238 | .451 | .813 |
| | Within Groups | 1760.997 | 245 | 7.188 | | |
| | Total | 1777.187 | 250 | | | |
| **Patient safety culture** | Between Groups | 162.865 | 5 | 32.573 | .971 | .436 |
| | Within Groups | 8219.868 | 245 | 33.550 | | |
| | Total | 8382.733 | 250 | | | |

The One Way ANOVA analysis reveals that there are no statistically significant differences between experience groups in terms of the quality of care and patient safety culture. The p-values for both variables are greater than 0.05, suggesting that experience does not have a significant effect on these outcomes in the given sample.

For Quality of Care, $F(5, 245) = 0.451$, $p = 0.813$ and For Patient Safety Culture, $F(5, 245) = 0.971$, $p = 0.436$

## Correlation Analysis

**Correlation Table 7.**

| | Knowledge & Practice | ADR reporting Attitude | Patient safety culture | Quality of care |
|---|---|---|---|---|
| **ADR Knowledge & Practices** | 1 | | | |
| **ADR reporting Attitude** | -.160* | 1 | | |
| **Patient safety culture** | .014 | .572** | 1 | |
| **Quality of care** | -.074 | .248** | .497** | 1 |

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

## This correlation analysis shows the following significant relationships

ADR Knowledge & Practices have a weak and statistically significant negative association with ADR Reporting Attitude, but no significant relationship with Patient Safety Culture or Quality of Care. ADR Reporting Attitude is positively and significantly correlated with both Patient Safety Culture and Quality of Care, suggesting that improving attitudes towards ADR reporting could enhance safety culture and care quality.

Patient Safety Culture and Quality of Care are positively and significantly correlated, indicating that a robust safety culture is linked with better quality of care.

Overall, these findings highlight the importance of fostering positive ADR Reporting Attitudes and a strong Patient Safety Culture as they are associated with improved Quality of Care.

### Descriptive Statistics

Descriptive statistics of demographics variable and four variables are shown in the Table 8 for n=251, minimum, maximum and mean of each variable are presented along with standard deviations.

**Table 8. Descriptive Statistic of study Variables**

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| **ADR Knowledge & Practices** | 251 | 9.00 | 18.00 | 12.17 | 1.70 |
| **ADR reporting Attitude** | 251 | 12.00 | 60.00 | 44.81 | 5.66 |
| **Patient safety culture** | 251 | 12.00 | 60.00 | 49.41 | 5.79 |
| **Quality of care** | 251 | 8.00 | 25.00 | 20.74 | 2.66 |

### Regression Analysis

Regression analysis is run to check the relationship between propose model. The results of regression analysis are mentioned in coming tables.

### Moderation Regression Analysis

**Table 9. Regression analysis was conducted to explore the relationships between knowledge, practices, and quality of care, as well as between knowledge, practices, patient safety culture, and quality of care**

| Predictors | B | $R^2$ | R |
|---|---|---|---|
| **Step 1** | | | |
| **Control Variables** | | 0.13 | |
| **Step 2** | | | |
| **K&PAR** | -.166*** | | |
| **ADRRA** | -.047*** | | |
| **PSC** | .260 | . 278 | .266 |
| **Step 3** | | | |
| **K&PAR* PSC** | 0.13* | | |
| **ADRRA * PSC** | .011* | .387 | .109* |

*p<.05 ** p<.01 *** p<.001

H1: Nurses' Knowledge and Practices towards adverse drug reaction (ADR) reporting systems have a positive impact on the quality of care.

A regression analysis was conducted to test this hypothesis. The results indicated a negative relationship between ADR Knowledge & Practices and quality of care (B = -.166, p < .001). However, the interaction with Patient Safety Culture (PSC) positively moderates the relationship, leading to an overall positive impact. The hypothesis is accepted with moderation of PSC.

H2: Nurses' Attitudes towards ADR reporting significantly enhance the quality of care.

Regression results show a negative but significant relationship between ADR Reporting Attitudes and quality of care (B = -.047, p < .001). However, Patient Safety Culture moderates this relationship (interaction term: B = .011, p < .05), leading to a net positive effect. Therefore, H2 is accepted under the moderation of PSC.

## DISCUSSION

In the healthcare organization adverse drug reactions reporting system plays a very important role, especially in the tertiary care hospitals. In the healthcare sector medication safety is very important. Medication adverse effects can be the reason for the permanent disability or resulted in death. The nurses' knowledge, practice and attitude is a very vital component toward the adverse drug reaction

reporting. Many studies have been conducted on this issue, but in Pakistan there are few studies have been conducted. However in Pakistan this issue neglects in mostly public hospitals due to over workload. Pakistan is facing the shortage of professional nurses. Mostly nurses are moving towards abroad because of their financial and other prospects. Nurses are the main drive force who handle the medication process and observe the negative medication effects on patients

Patient safety culture or organizational safety culture in a hospital setting shows to the combined ethics, beliefs, attitudes, and performances that keep the patient safety as an essential element of healthcare delivery. A positive patient safety culture encourages teamwork through disciplines, continuous learning through feedback mechanisms, and loyalty to evidence based practices intended at reducing negative effects and improving patient outcomes. It needs leadership support, staff commitment, and constant assessment to ensure that safety remains a top priority throughout all levels of the healthcare organization.

The statistical analysis was run on collected data through SPSS that shows interesting results which are discussed in coming section.

*Hypothesis 1: Nurses' Knowledge and Practice of ADR Reporting (K&PADRR) and Its Negative Impact on Quality of Care (QC)*

Discuss how the finding of a negative impact contrasts with studies that emphasize the positive role of nurses' knowledge in ADR reporting. For example, highlight how earlier studies(Afaya et al., 2021; Shukla et al., 2024)found that adequate knowledge improves ADR reporting, but this study suggests that even with knowledge, there might be operational or structural barriers that hinder care quality. Explore why the negative impact may arise. For instance, despite high knowledge levels, nurses may lack confidence, or the reporting systems in place might be inefficient, resulting in overburdened nurses underreporting ADRs. This contrasts with other settings where nurses' knowledge correlates positively with quality outcomes.

Discuss the potential for cultural differences, staffing shortages, or systemic inefficiencies in Pakistan compared to other countries where knowledge positively impacts quality of care(Hashmi et al., 2020).

*Hypothesis 2: Adverse Drug Reaction Reporting Attitude (ADRRA) and Its Negative Impact on Quality of Care (QC)*

Many research (e.g., Misra et al., 2019) have found that a positive attitude regarding ADR reporting frequently results in better quality of treatment, which contradicts this conclusion of a detrimental influence(Misra et al., 2019). Highlight conflicting research that links unfavorable attitudes to underreporting or misreporting(Zewde, 2020), which is consistent with these findings. Explain why a negative reporting attitude may harm quality of care. For example, if nurses view reporting as punitive or time-consuming, they may avoid it, leading to missed opportunities for intervention or correction of harmful medication practices. Suggest that training programs aimed at fostering positive reporting attitudes should not only focus on skills but also address cultural barriers that lead to fear of reporting. A comparison to studies (Salehi et al., 2021; Shukla et al., 2024)that show educational interventions improving attitudes can help justify such strategies.

*Hypothesis 3: Knowledge and Practice of ADR Reporting (K&PADRR) and Patient Safety Culture (PSC) Positively Influence Quality of Care (QC)*

Our finding of a positive association between K&PADRR and PSC with QC aligns with existing literature, such as(Singh et al., 2017) and(Donaldson et al., 2017), which suggests that fostering both knowledge and a strong safety culture improves care outcomes. Compare how in some studies(DiCuccio, 2015), the absence of a strong safety culture diminishes the potential benefits of knowledge on care quality, which could explain why in this setting, both factors must coexist to improve care quality. Emphasize that the interaction between knowledge and safety culture is more important than their individual effects. Current study shows that where knowledge alone had a negative impact, when combined with a strong patient safety culture, it resulted in improved care quality. Recommend that patient safety culture should be a priority in hospital policies alongside ongoing knowledge improvement. Compare strategies from other countries that have successfully integrated these components, improving healthcare outcomes.

*Hypothesis 4: Adverse Drug Reaction Reporting Attitude (ADRRA) and Patient Safety Culture (PSC) Positively Influence Quality of Care (QC)*

Studies (Chegini et al., 2020; Habibi Soola, Ajri-Khameslou, Mirzaei, & Bahari, 2022)support current finding that when Adverse drug reaction reporting is combined with a strong safety culture, quality of care improves. This contrasts with earlier results where adverse drug reaction reporting attitude alone negatively affected quality of care. Delve into how safety culture acts as a buffer against negative attitudes. For instance, nurses in an environment with strong safety culture may feel more supported to report ADRs even if they initially have a negative attitude towards reporting. Discuss how in some healthcare settings, weak leadership or fear of punishment may diminish the benefits of a positive reporting attitude(Alanazi, Falqi, & Healthcare, 2023), whereas this findings suggest that the organizational culture plays a decisive role. Emphasize the need for leadership to foster a non-punitive environment, as it helps mitigate the negative impact of poor reporting attitudes on care quality. Recommendations can be drawn from (Jember et al., 2018; Shenoy, 2021), who stress the role of leadership in improving reporting culture.

**Implications for Nursing Management (Theoretical and Practical)**

**Theoretical Implications**

*Hypothesis 1: (Knowledge & Practices of ADR Reporting negatively affects Quality of Care)*

The negative relationship between nurses' Knowledge and Practice of Adverse Drug Reaction Reporting (K&PADRR) and Quality of Care (QC) challenges some of the existing safety models, such as Reason's Swiss Cheese Model, which emphasizes the role of knowledge in error prevention. This finding suggests a potential misalignment between the theoretical importance of reporting knowledge and its practical application. The data implies that focusing solely on enhancing reporting knowledge and practices may lead to unintended burdens on nurses, negatively impacting care quality. The study extends current theories by highlighting the need for a more balanced approach, integrating workload management with knowledge enhancement in the context of pharmacovigilance.

*Hypothesis 2: (Attitude toward ADR Reporting negatively impacts Quality of Care)*

The finding that a negative attitude towards adverse drug reaction reporting (ADRRA) leads to a decrease in the Quality of Care supports behavioral theories, such as the Theory of Planned Behavior (Ajzen & technologies, 2020), which links attitudes to behavior. This highlights that without addressing the motivational and organizational barriers, simply improving knowledge will not enhance reporting behavior. This confirms that attitude-behavior consistency needs to be a key component in healthcare safety models. The study reinforces the idea that creating positive attitudes through incentives and training is essential for effective reporting.

*Hypothesis 3: (Positive K&PADRR and Patient Safety Culture increase Quality of Care)*

The positive interaction between Patient Safety Culture (PSC) and Knowledge & Practice of ADR Reporting (K&PADRR) directly supports models of High-Reliability Organizations (HROs), where a culture of safety complements and enhances individual skills. The findings validate Schein's Organizational Culture Model by showing that a strong patient safety culture mitigates the challenges of ADR reporting knowledge and practices. This contribution strengthens existing theoretical frameworks by empirically confirming the moderating role of organizational culture in improving care quality through knowledge integration.

*Hypothesis 4: (ADRRA and PSC positively influence Quality of Care)*

The significant positive relationship between ADR Reporting Attitude (ADRRA) and Patient Safety Culture (PSC) and its impact on the Quality of Care (QC) strengthens Social Cognitive Theory(Bandura, 1986), which suggests that attitudes and behaviors are shaped by social environments. A supportive safety culture positively influences attitudes and behaviors, leading to better patient outcomes. This confirms the moderating role of culture in overcoming negative attitudes, showing that patient safety culture can turn adverse reporting behaviors into a positive force in enhancing the quality of care.

**Practical Implications:**

*Hypothesis 1: (K&PADRR negatively impacts Quality of Care)*

Targeted Workload Management: Nursing management should create strategies to balance the time nurses spend on ADR reporting with their direct patient care responsibilities. This may include allocating specific times for reporting tasks or delegating the task to specialized personnel to avoid overburdening nursing staff. Tailored on-the-job reporting tools (e.g., quick forms or digital systems) could be implemented to reduce the reporting time.

*Hypothesis 2: (ADR Reporting Attitude negatively impacts Quality of Care)*

Attitudinal Interventions: Nursing leadership must focus on changing negative attitudes toward ADR reporting by incorporating regular feedback sessions, where nurses are shown the value of their reports in improving patient outcomes. Incentives such as recognition, awards, or financial bonuses should be tied to the consistent and accurate reporting of adverse drug reactions, making reporting a rewarding behavior.

*Hypothesis 3: (K&PADRR and PSC positively impact Quality of Care)*

Safety Culture Programs: To enhance Patient Safety Culture in conjunction with reporting knowledge, management should implement a comprehensive safety education program, which includes team-building exercises, patient safety workshops, and interdisciplinary communication platforms. Encourage cross-department learning between nursing and pharmacovigilance teams to create a more integrated approach to safe drug administration and ADR reporting.

*Hypothesis 4: (ADRRA and PSC positively influence Quality of Care)*

Leadership in Safety Culture: Nursing leaders must act as champions for Patient Safety Culture and encourage open and non-punitive reporting. Leaders can promote ADR reporting through regular anonymous surveys to measure attitudes and immediate action plans to address concerns. Create open forums for staff to express their safety concerns and suggest improvements. This would foster a transparent environment that improves both attitudes and practices surrounding ADR reporting.

**Limitations of study**

- Limited Generalizability: Findings are specific to one hospital in Islamabad.
- Self-reported Data: May introduce response bias.
- Cross-sectional Design: Prevents causal inferences.
- Sample Size: May not reflect broader healthcare settings.
- Nurse-focused: Excludes other healthcare professionals involved in ADR reporting.
- Time Constraints: Captures only a snapshot in time.

**Future Directions**

- Broaden Scope: Include other healthcare professionals (e.g., physicians, pharmacists).
- Longitudinal Studies: Track changes in attitudes and practices over time.
- Intervention Evaluation: Assess training programs' impact on ADR reporting.
- Multi center Research: Expand to multiple hospitals for broader insights.
- Technology Integration: Study the impact of electronic reporting systems.
- Organizational Factors: Explore how different hospital cultures affect ADR reporting.

## CONCLUSION

The current study provides important comprehensions into the link between nurses' knowledge, practices, and attitudes towards adverse drug reaction reporting systems and patient safety culture in a Pakistani tertiary care hospital. Further Study shows that nurses understand the need for reporting, but there are gaps due to fear of legal implications, lack of information, and insufficient training. The study suggests that a strong patient safety culture, promoting open communication, non-punitive reporting, and shared responsibility, can improve nurses' reporting practices. It also

emphasizes the importance of institutional support and nursing leadership in promoting safety culture.

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## RESEARCH QUESTIONNAIRE

**Dear Respondent,**

I am a MS Scholar at Riphah International University Islamabad. I am carrying out a study on ***"Assessing the Knowledge, Attitude and Practices of Nurses towards Adverse Reaction Reporting Systems to Improve Quality of Care in a Tertiary Care Hospital in Islamabad, Pakistan"***. In this regard, the following information is needed to help me with the statistical analyses of the data. This information will allow comparisons among different groups of employees and comparisons with similar employees in other organizations. All of your responses are strictly confidential; individual responses will not be seen by anyone within this organization. We appreciate your help in providing this important information. Any suggestion/comments from your side will be highly appreciated.

**Tanveer Iqbal Malik**

tanveer.iqbal@shifa.com.pk

**SECTION A:** .

**PERSONAL INFORMATION**

| | | | | | |
|---|---|---|---|---|---|
| Your Name: (Optional) | | | | | |
| Your gender: | 1. Male | | 2. Female | | |
| Your Qualification: | 1. Intermediate | 2. Graduation | 3. Masters | 4. MS/Phil | 5. PhD |
| Your E-mail: (Optional) | | | | | |
| Your age : | | | | | |
| Working experience (in years): | | | | | |

**SECTION B:** .

Please tick what is most appropriate to you

| Yes | No |
|---|---|
| 1 | 2 |

| | **Knowledge of Adverse drug reactions**<br>Shanko, H., & Abdela, J. (2018). Knowledge, attitudes, and practices of health care professionals toward adverse drug reaction reporting in Hiwot Fana Specialized University Hospital, Harar, Eastern Ethiopia: a cross-sectional study. *Hospital Pharmacy*, *53*(3), 177-187. | | |
|---|---|---|---|
| 1 | Do you know adverse drug reaction reporting system? | 1 | 2 |
| 2 | Do you think that adverse drug reaction is the same with side effect? | 1 | 2 |
| 3 | Is adverse drug reaction reporting important for patient/medicine safety? | 1 | 2 |
| 4 | Do you think that adverse drug reactions are well documented at the time a drug is marketed? | 1 | 2 |
| 5 | Do you Know how to report an adverse drug reaction? | 1 | 2 |

**SECTION C:** .

Please tick what is most appropriate to you

| Yes | No | Not Encountered |
|---|---|---|
| 1 | 2 | 3 |

| | **Practices of Adverse drug reactionsreporting**<br>Shanko, H., & Abdela, J. (2018). Knowledge, attitudes, and practices of health care professionals toward adverse drug reaction reporting in Hiwot Fana Specialized University Hospital, Harar, Eastern Ethiopia: a cross-sectional study. *Hospital Pharmacy*, *53*(3), 177-187. | | | |
|---|---|---|---|---|
| 1 | Are adverse drug reaction reporting forms easily available to you in practice? | 1 | 2 | |
| 2 | Have you ever encountered an adverse drug reaction in practice? | 1 | 2 | 3 |
| 3 | Have you ever reported an adverse drug reaction that you encountered? | 1 | 2 | 3 |
| 4 | How many adverse drug reaction reports have you submitted on average? (Per Month) | 1-3 | 4-6 | 7-10 |
| 5 | Any previous training seminars/workshops on adverse drug reaction reporting? | 1 | 2 | |

**SECTION D:** .

Please tick what is most appropriate to you

| I strongly disagree | Disagree | Not sure | Agree | I strongly agree |
|---|---|---|---|---|
| 1 | 2 | 3 | 4 | 5 |

| | **Attitude toward Adverse drug reactions Reporting**<br>Rijims, M et al,.(2023). Assessment of Knowledge, Attitude, and Practice (KAP) as well as facilitators and barriers in reporting adverse drug reactions among health care professionals at a neonatal intensive care unit in Qatar. *Journal of Pharmaceutical Negative Results*, 975-985. | | | | | |
|---|---|---|---|---|---|---|
| 1 | I am aware of the adverse drug reactions reporting system and process | 1 | 2 | 3 | 4 | 5 |
| 2 | I report adverse drug reactions because others in my unit report | 1 | 2 | 3 | 4 | 5 |
| 3 | I am confident of my ability to report adverse drug reactions | 1 | 2 | 3 | 4 | 5 |
| 4 | Reporting Adverse drug reactions will help to improve patient Safety culture in my organization | 1 | 2 | 3 | 4 | 5 |
| 5 | I have received sufficient training in adverse drug reactions Reporting | 1 | 2 | 3 | 4 | 5 |

| | | | | | | |
|---|---|---|---|---|---|---|
| 6 | I feel it is my professional duty to report Adverse drug reactions | 1 | 2 | 3 | 4 | 5 |
| 7 | I don't feel it is within my scope of practice to report Adverse drug reactions | 1 | 2 | 3 | 4 | 5 |
| 8 | I have enough support from the leadership to report the Adverse drug reactions | 1 | 2 | 3 | 4 | 5 |
| 9 | I believe that each adverse drug reaction report I submit can make a significant contribution to patient care & safety | 1 | 2 | 3 | 4 | 5 |
| 10 | I don't think it matters even if I report Adverse drug reactions | 1 | 2 | 3 | 4 | 5 |
| 11 | For me, reporting adverse drug reactions is of low priority compared to other professional duties | 1 | 2 | 3 | 4 | 5 |
| 12 | When I submit an adverse drug, reaction report I am confident that I will receive a feedback which focuses on the system and not the Individual | 1 | 2 | 3 | 4 | 5 |

**SECTION E:** .

**Patient safety culture**

Han, Y., Kim, J. S., & Seo, Y. (2020). Cross-sectional study on patient safety culture, patient safety competency, and adverse events. *Western journal of nursing research*, *42*(1), 32-40.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | Teamwork within units | 1 | 2 | 3 | 4 | 5 |
| 2 | Supervisor/manager expectations and actions promoting patient safety | 1 | 2 | 3 | 4 | 5 |
| 3 | Organizational learning-continuous improvement | 1 | 2 | 3 | 4 | 5 |
| 4 | Management support for patient safety | 1 | 2 | 3 | 4 | 5 |
| 5 | Overall perceptions of patient safety | 1 | 2 | 3 | 4 | 5 |
| 6 | Feedback and communication about error | 1 | 2 | 3 | 4 | 5 |
| 7 | Communication openness | 1 | 2 | 3 | 4 | 5 |
| 8 | Frequency of events reported | 1 | 2 | 3 | 4 | 5 |
| 9 | Non punitive response to errors | 1 | 2 | 3 | 4 | 5 |
| 10 | Working in teams with other health professionals | 1 | 2 | 3 | 4 | 5 |
| 11 | Managing safety risk | 1 | 2 | 3 | 4 | 5 |
| 12 | Recognizing and responding to adverse events | 1 | 2 | 3 | 4 | 5 |

**SECTION F:** .

**Quality of care**

Van Bogaert, P et al,. (2014). Nursing unit teams matter: Impact of unit-level nurse practice environment, nurse work characteristics, and burnout on nurse reported job outcomes, and quality of care, and patient adverse events—A cross-sectional survey. *International journal of nursing studies*, *51*(8), 1123-1134.

| | | | | | | |
|---|---|---|---|---|---|---|
| 1 | The Quality of Care in the hospital has improved over the last year. | 1 | 2 | 3 | 4 | 5 |
| 2 | The Quality of Care has improved at the current unit. | 1 | 2 | 3 | 4 | 5 |
| 3 | The Quality of Care has improved at the last shift | 1 | 2 | 3 | 4 | 5 |
| 4 | Medications errors Improved | 1 | 2 | 3 | 4 | 5 |
| 5 | Decrease the Patient and family complaints | 1 | 2 | 3 | 4 | 5 |