

Knowledge, attitudes, and practice of nurses regarding adverse drug reaction reporting in Herat, Afghanistan: A cross-sectional study

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Abstract

Background: ADRs pose significant risks to patient safety, making effective reporting essential for pharmacovigilance. This study aimed to assess the KAP of nurses regarding ADR reporting in Herat, Afghanistan.

Methods: A cross-sectional study was conducted from January to March 2024, involving 385 nurses across various healthcare facilities, including hospitals and clinics. A structured self-administered questionnaire was utilized to collect data on sociodemographic characteristics, knowledge, attitudes, and practices related to ADR reporting. Statistical analyses were performed using SPSS version 27, with significance set at $p < 0.05$.

Results: The study found that 60.8% of participants were aware of what an ADR is, yet only 5.5% had reported an ADR. Attitudes toward ADR reporting were generally positive, with 79.7% believing it is part of a nurse's role. However, significant gaps in knowledge and actual reporting practices were identified. Barriers included lack of training and fear of legal repercussions.

Conclusion: While nurses in Herat exhibit a positive attitude toward ADR reporting, knowledge gaps and low reporting rates highlight the need for targeted educational interventions and institutional support to enhance pharmacovigilance efforts in the region

Keywords: Knowledge; Attitude; Practice; Nurse; Adverse drug reaction

1. Introduction

Adverse Drug Reactions (ADRs) are unintended and harmful effects caused by medications, representing a substantial cause of hospitalizations, morbidity, and even mortality across the globe [1,2]. Effective ADR reporting is essential for ensuring patient safety and enabling healthcare systems to monitor and manage medication risks comprehensively [3,4]. Reporting ADRs, a core aspect of pharmacovigilance, allows health authorities to identify and mitigate risks associated with drugs, thereby improving patient outcomes [5]. However, underreporting remains a significant issue, with studies indicating that up to 94% of ADRs may go unreported, significantly undermining pharmacovigilance efforts [1].

Nurses are uniquely positioned to contribute to ADR reporting due to their direct, continuous interaction with patients, allowing them to observe and document drug effects effectively [6,7]. Studies in the UK have shown that reports from nurses are comparable in quality to those from doctors, underscoring the valuable role that nursing staff can play in enhancing pharmacovigilance [8]. However, various factors hinder nurses from participating actively in ADR reporting, including lack of awareness, inadequate training, and limited confidence in existing reporting systems [9]. Furthermore,

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it has been noted that supportive interventions, such as educational outreach and direct encouragement, can significantly improve reporting rates among healthcare professionals, thereby enhancing the pharmacovigilance framework within healthcare institutions [10].

In Afghanistan, formal ADR reporting systems are still emerging, particularly in major healthcare centers like Herat. Understanding the knowledge, attitudes, and practices (KAP) of nurses regarding ADR reporting is essential for improving pharmacovigilance in the region. This study aims to evaluate the KAP of nurses in Herat concerning ADR reporting, identify barriers, and propose targeted interventions to support the development of a robust ADR reporting system in Afghanistan. Lessons learned from other regions highlight the importance of engaging healthcare workers at all levels, ensuring that they are well-trained and supported in reporting ADRs, which ultimately contributes to enhanced patient safety [5,11].

The findings from this study provide the current state of ADR reporting among nurses in Herat. By evaluating their KAP, the study aims to shed light on the specific knowledge gaps and attitudinal barriers that may hinder effective ADR reporting. Moreover, identifying these gaps allows for the development of targeted educational interventions tailored to the needs of nurses in this context. Ultimately, this research seeks to contribute to the establishment of a more effective ADR reporting system in Afghanistan, thereby promoting patient safety and improving healthcare outcomes in a country where the formal pharmacovigilance framework is still in its infancy.

2. Methodology

2.1. Study Design and Setting

This cross-sectional study was conducted among nurses in Herat, Afghanistan, from January to March 2024. A convenience sampling method was employed to assess the KAP of nurses regarding ADR reporting. The study targeted nurses working across multiple healthcare facilities, including Herat Regional Hospital, five private hospitals, three governmental clinics, and two private clinics. Data were collected using a structured, self-administered questionnaire, which was distributed in key departments within each facility, such as the emergency, internal medicine, and surgery wards. A total of 385 completed questionnaires were retrieved during the study period.

2.2. Study Participants

Nurses working in selected hospitals and clinics in Herat were invited to participate in the study. Eligible participants included registered nurses and nurse assistants involved in direct patient care, employed at the selected health facilities during the data collection period. Participation was voluntary, and no monetary incentives were provided.

2.3. Recruitment Strategy for Target Population

The recruitment process was facilitated by head nurses and unit supervisors in each facility. These individuals distributed information about the study and invited eligible nurses to participate. Information sessions were held in each facility to brief participants on the study's purpose, procedures, and importance. Nurses were given the opportunity to ask questions before deciding to participate, ensuring informed consent.

2.4. Sample Size and Justification

In the absence of precise data on the total population of nurses in Herat, a sample size of 385 was estimated to provide adequate statistical power. This estimation was based on a 5% margin of error, a 95% confidence level, and an assumed response proportion of 50%.

2.5. Data Collection

Participants who provided written informed consent were asked to complete a self-administered questionnaire. The questionnaire contained sections on demographic information, as well as items addressing knowledge, attitudes, and practices related to ADR reporting. The questionnaire was adapted from validated KAP surveys used in previous studies on ADR reporting among healthcare workers [12] and reviewed by a panel of pharmacovigilance experts. A pilot test was conducted with 20 nurses, with adjustments made to improve clarity and relevance based on their feedback. Reliability testing yielded acceptable Cronbach's alpha coefficients of 0.81 for the knowledge section, 0.75 for the attitude section, and 0.84 for the practice section.

2.6. Questionnaire and Scoring System

The questionnaire comprised four sections: (1) sociodemographic information (5 items), (2) knowledge on ADR reporting (18 items), (3) attitudes towards ADR reporting (10 items), and (4) practices related to ADR reporting (10 items). Knowledge and practice questions were binary (Yes/No) and scored as 1 for correct or positive responses, and 0 for incorrect or negative responses. The knowledge section had a maximum possible score of 13, while the practice section had a maximum score of 10. The attitude section employed a five-point Likert scale (ranging from 1: Strongly Disagree to 5: Strongly Agree), resulting in a total attitude score range of 12 to 60. Based on median scores, participants were categorized into high and low groups for knowledge, attitudes, and practices.

2.7. Data Analysis

All collected data were checked for completeness and accuracy before analysis. Incomplete questionnaires were excluded. Data were entered into SPSS version 27 for analysis. Descriptive statistics, including frequencies, percentages, means, and standard deviations, were used to summarize demographic characteristics and KAP scores. The normality of continuous variables was assessed using the Shapiro-Wilk test. Bivariate analyses were conducted using chi-square tests to assess associations between demographic characteristics and KAP scores. A p-value < 0.05 was considered statistically significant.

2.8. Ethical Considerations

Ethical approval for this study was obtained from the Institutional Review Board (IRB) of Jami University on January 27, 2024 (J.2024.1.27.2). All participants provided written informed consent, with assurances that their responses would remain confidential and anonymous. The study adhered to the principles outlined in the Declaration of Helsinki and maintained strict confidentiality throughout the data collection and analysis process. Participants were informed of their right to withdraw from the study at any time without consequence.

3. Results

Table 1 provides an overview of the sociodemographic characteristics of the participants. The sample consisted of 54% male and 46% female participants. The majority of respondents were aged between 25-29 years (39.5%), with over half (54%) having less than five years of professional experience. Most participants were employed in either private hospitals (40%) or Herat Regional Hospital (32.7%), while fewer worked in private clinics, governmental clinics, or doctors' offices. Additionally, a slight majority were married (54.8%). These findings highlight a young, predominantly male sample with varying professional backgrounds, primarily in private and regional hospital settings.

Table 1 Demographic Characteristics of Participants

Variables		N	%
Gender	Male	208	54.0
	Female	177	46.0
Age	18-24	88	22.9
	25-29	152	39.5
	30-34	80	20.8
	>=35	65	16.9
Marital Status	Single	174	45.2
	Married	211	54.8
Hospital	Herat Regional Hospital	126	32.7
	Private Hospitals	154	40.0
	Governmental Clinics	38	9.9
	Private Clinics	50	13.0
	Doctors' Office	17	4.4

Experience year	<5	208	54.0
	>=5	177	46.0

Table 2 details participants' knowledge and practice regarding ADR reporting. Notably, while 86% of participants recognized that all ADRs should be reported, only 44.9% were aware of what pharmacovigilance entails, indicating gaps in foundational knowledge. Additionally, 77.1% were aware of the national ADR reporting system, yet 70.9% did not know the primary reporting methods. In terms of practice, a striking 94.5% of participants had never reported an ADR, though 69.1% reported regularly checking for potential ADRs in patients. Only 27.8% had attended ADR reporting training. These results suggest strong recognition of ADR reporting importance, but significant deficiencies in both knowledge and practical engagement.

Table 2 Participants' Knowledge and Practice on ADR Reporting

Questions	Wrong		Correct	
	N	%	N	%
Knowledge				
Do you know what pharmacovigilance is?	212	55.1	173	44.9
Are you aware of what an Adverse Drug Reaction (ADR) is?	151	39.2	234	60.8
Do you believe all adverse drug reactions need to be reported?	54	14.0	331	86.0
Are you aware of the national ADR reporting system?	88	22.9	297	77.1
Do you know what a Yellow Card is in the context of ADR reporting?	62	16.1	323	83.9
Have you heard of the term "drug safety monitoring"?	80	20.8	305	79.2
Do you know who is responsible for reporting ADRs in your hospital?	122	31.7	263	68.3
Is there a designated ADR reporting system in your facility?	50	13.0	335	87.0
Do you know how to identify an ADR?	212	55.1	173	44.9
Can ADRs result in patient hospitalization?	63	16.4	322	83.6
Are you aware that ADRs can increase healthcare costs?	51	13.2	334	86.8
Do you know which healthcare professionals can report ADRs?	103	26.8	282	73.2
Are you familiar with the role of nurses in ADR reporting?	53	13.8	332	86.2
Do you think ADR reporting is part of a nurse's role?	78	20.3	307	79.7
Can ADR reporting help in preventing drug-related deaths?	270	70.1	115	29.9
Do you know the primary methods of ADR reporting (e.g., online, phone, paper forms)?	273	70.9	112	29.1
Are you aware that under-reporting ADRs can affect drug safety monitoring?	279	72.5	106	27.5
Do you know if ADR reporting is encouraged by your hospital's management?	245	63.6	140	36.4
Practice				
Have you ever reported an ADR?	21	5.5	364	94.5
Do you regularly check for potential ADRs in patients?	119	30.9	266	69.1
Do you document ADRs in patient records?	158	41.0	227	59.0
Have you ever attended a training session on ADR reporting?	278	72.2	107	27.8
Do you discuss ADRs with other healthcare providers?	126	32.7	259	67.3
Do you have access to ADR reporting tools at work?	101	26.2	284	73.8

Do you use hospital guidelines to identify ADRs?	126	32.7	259	67.3
Have you ever used a Yellow Card to report an ADR?	235	61.0	150	39.0
Do you feel confident in identifying ADRs in patients?	125	32.5	260	67.5
Do you know where to submit ADR reports?	235	61.0	150	39.0

Table 3 presents participant attitudes towards ADR reporting. While a large proportion (59%) strongly agreed that ADR reporting is an essential part of their professional responsibilities, only 10.4% found the current ADR reporting system easy to use, suggesting perceived barriers. Most participants (64.2%) strongly agreed that ADR reporting should be included in nurse training programs, and 64.7% were motivated to report ADRs in practice. However, there was considerable concern about potential legal consequences, with 19.5% strongly agreeing and 13.5% agreeing that this was a discouraging factor. The findings emphasize strong motivation for ADR reporting but indicate perceived challenges related to legal implications and system usability.

Table 3 Participants' Attitudes Towards ADR Reporting

Questions	Strongly Agree	Agree	Not sure	Disagree	Strongly Disagree
	%	%	%	%	%
ADR reporting is an essential part of my professional responsibilities.	59	29.6	6.8	2.6	2.1
I believe ADR reporting improves patient safety.	10.1	10.4	14.3	33.5	31.7
I feel that nurses should be actively involved in ADR reporting.	44.9	45.2	8.6	1	0.3
ADR reporting should be mandatory for all healthcare professionals.	48.6	42.3	6	1.6	1.6
I am motivated to report ADRs in my practice.	64.7	30.1	1.6	2.1	1.6
Fear of legal consequences discourages me from reporting ADRs.	19.5	13.5	5.7	32.2	29.1
I believe ADR reporting should be included in nurse training programs.	64.2	25.2	4.9	2.9	2.9
Management support is necessary for effective ADR reporting.	6.5	17.1	12.5	43.4	20.5
I feel that reporting ADRs can prevent harm to future patients.	45.5	34.3	12.5	6.2	1.6
I believe that the current ADR reporting system is easy to use.	10.4	23.6	13.5	37.1	15.3

Table 4 explores the association between sociodemographic characteristics and participants' knowledge, attitudes, and practices regarding ADR reporting. Notably, male participants had significantly higher knowledge scores compared to females ($p=0.014$), while no significant gender difference was observed for attitudes or practices. Age also showed a notable trend: participants aged 35 and older had higher knowledge scores, suggesting increased familiarity with ADR reporting among more experienced staff. Interestingly, no significant differences were found between hospital type or years of experience and ADR reporting practices, indicating that these factors may not influence practical engagement in ADR reporting. These results suggest that while knowledge may be influenced by gender and age, attitudes and practices appear relatively consistent across demographic groups.

Table 4 Association Between Sociodemographic Factors and Knowledge, Attitude, and Practice on ADR Reporting

Variables		Knowledge		P-value	Attitude		P-value	Practice		P-value
		Insufficient	Sufficient		Insufficient	Sufficient		Insufficient	Sufficient	
		%	%	%	%	%	%			
Gender	Male	41.6	57.1	0.014	53.5	64.7	0.366	58.8	50.2	0.093
	Female	58.4	42.9		46.5	35.3		41.2	49.8	
Age	18-24	27.3	21.8	0.132	22.8	23.5	0.587	21.8	23.7	0.427
	25-29	37.7	39.9		39.4	41.2		39.4	39.5	
	30-34	26.0	19.5		20.4	29.4		20.0	21.4	
	>=35	9.1	18.8		17.4	5.9		18.8	15.3	
Marital Status	Single	48.1	44.5	0.573	44.8	52.9	0.512	47.1	43.7	0.513
	Married	51.9	55.5		55.2	47.1		52.9	56.3	
Hospital	Herat Regional Hospital	27.3	34.1	0.134	32.6	35.3	0.284	28.2	36.3	0.129
	Private Hospitals	37.7	40.6		39.7	47.1		41.2	39.1	
	Governmental Clinics	7.8	10.4		10.1	5.9		8.2	11.2	
	Private Clinics	19.5	11.4		13.6	.0		16.5	10.2	
	Doctors' Office	7.8	3.6		4.1	11.8		5.9	3.3	
Experience year	<5	55.8	53.6	0.720	54.3	47.1	0.555	58.2	50.7	0.141
	>=5	44.2	46.4		45.7	52.9		41.8	49.3	

4. Discussion

This study assessed the KAP of nurses in Herat, Afghanistan, regarding ADR reporting. The results reveal significant gaps in both knowledge and practical engagement in ADR reporting, alongside generally positive attitudes, which is consistent with findings in similar studies. These findings suggest that targeted educational and institutional interventions may be necessary to enhance ADR reporting among nurses.

The findings indicate that while the majority of participants recognized the importance of ADR reporting, they lacked foundational knowledge about ADR processes and pharmacovigilance [13,14]. This aligns with findings from John et al. (2012), who noted that uncertainty about ADR definitions and reporting mechanisms was a major barrier among nurses. Additionally, lack of knowledge about pharmacovigilance has been identified as a significant factor affecting nurses' reporting rates in previous studies, suggesting a need for improved training and awareness [9]. Educational programs specifically focusing on ADR definitions, the importance of reporting, and the steps involved could effectively improve nurses' knowledge, thereby facilitating more consistent reporting practices.

Participants cited several barriers to ADR reporting, including fear of legal consequences and perceived lack of support [15,16]. These findings are consistent with previous research, which found that perceived legal risks and concerns about

professional repercussions often deter healthcare workers from reporting ADRs (Pushkin et al., 2010). Further, Morrison-Griffiths and Pirmohamed (2000) highlighted that nurses often feel unprepared to manage the potential legal implications of reporting, particularly when ADRs involve severe reactions. Addressing these concerns through legal clarification and institutional support could reduce nurses' hesitation and encourage reporting [8,9].

Despite the knowledge gaps, the study found that nurses generally have positive attitudes toward ADR reporting, recognizing it as a critical aspect of their professional responsibility [12,17]. This positive attitude mirrors findings from other studies, where nurses expressed strong agreement on the importance of ADR reporting for patient safety (Hanafi et al., 2012). However, a similar study conducted by Salehi et al. (2021) revealed that, despite positive attitudes, actual reporting rates remained low, indicating that while attitudes are necessary, they are insufficient on their own to drive behavior change [12,18].

Training has shown to be an influential factor in improving ADR reporting practices among nurses. In this study, a majority of participants had never attended ADR-specific training [19,20]. Training programs that focus on practical skills in ADR identification and reporting could lead to significant improvements. According to De Angelis et al. (2015), targeted training increased both the quantity and quality of ADR reports among nurses, suggesting that ongoing education can empower nurses to engage more actively in pharmacovigilance [21].

The study also highlighted that many nurses felt unsupported by their institutions, which likely contributes to low ADR reporting rates [22,23]. This issue is not unique to Afghanistan; similar findings have been reported globally. For example, a study by Zurita-Garaicoechea et al. (2015) found that the availability of resources and management support were crucial in enabling ADR reporting. Further, Kiguba et al. (2014) noted that improving reporting systems and providing clear guidance on ADR reporting protocols can significantly improve engagement among healthcare workers [24,25].

4.1. Recommendations

Recommendations for Future Interventions: To address the gaps identified in this study, several recommendations can be made. First, educational interventions that emphasize ADR reporting protocols and legal protections can help increase knowledge and confidence among nurses. Second, management should prioritize the creation of a supportive environment that encourages ADR reporting, perhaps by recognizing and rewarding consistent reporters. Lastly, integrating ADR reporting into regular clinical workflows may reduce time constraints and encourage routine practice, as suggested by Schutte et al. (2017) [26].

4.2. Strengths and Limitations

This study's strengths include its cross-sectional design, which enabled data collection from a diverse sample of nurses across various healthcare settings in Herat, enhancing the generalizability of the findings. Additionally, the use of a validated, self-administered questionnaire ensured reliable data collection on knowledge, attitudes, and practices (KAP) regarding ADR reporting. The questionnaire's pilot testing and expert review further ensured relevance and clarity for the target population.

However, the study has limitations. Convenience sampling may have introduced selection bias, as only available and willing participants were included, potentially affecting representativeness. Self-reported data can also be susceptible to social desirability bias, with participants potentially over-reporting positive attitudes or practices. Finally, the cross-sectional design provides a snapshot in time, limiting the ability to assess changes or causality; longitudinal research would be useful for tracking KAP changes over time, especially following training interventions.

5. Conclusion

This study highlights significant knowledge and practice gaps in ADR reporting among nurses in Herat, despite generally positive attitudes. Addressing these challenges requires a multifaceted approach involving educational interventions, management support, and systemic changes to make ADR reporting an integral part of clinical practice. By implementing these strategies, healthcare institutions in Afghanistan can improve patient safety and contribute to global pharmacovigilance efforts.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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