ORIGINAL ARTICLE

NURSES KNOWLEDGE, ATTITUDE AND PRACTICES REGARDING ADVERSE DRUG REACTIONS AND PRESCRIBING CASCADES REPORTING IN TERTIARY CARE HOSPITALS, PESHAWAR

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ABSTRACT

Objective: To assess knowledge, attitude and practices (KAP) of nurses' regarding adverse drug reactions and prescribing cascades reporting in tertiary care hospitals of Peshawar, Pakistan.

Material & Methods: A cross-sectional study was conducted in tertiary care hospitals, Peshawar. The Rao soft online sample size calculator was used to determine the sample size of 224. A pre-designed, structured questionnaire was used to collect data via convenient sampling technique. SPSS version 20 was used for data analysis.

Results: Majority of the participants (54.5%) had average knowledge. Only a few participants (21.4%), knew the term prescribing cascade. A considerable percentage of respondents (83.5%) agreed that ADRs reporting is their professional responsibility. Moreover, 52.2% of the respondents revealed that no ADR was reported by them during their practice and 78.1% reported that they haven't filled in an ADR reporting form. Majority of the participants (65.2%) had poor practices regarding ADRs and prescribing cascades reporting. Nurses' knowledge was significantly associated with age (P=0.009) and years of experience (P= 0.038).

Conclusion: Nurses had average knowledge, ambivalent attitude and poor practices. It highlights a significant gap in both knowledge and practice related to ADRs and prescribing cascades reporting.

Key Words: Adverse reactions, Drug, Medication safety, Nurses.

This article may be cited as: Zeb A, Afzal Y, Khan M, Shah A, Jahan M, Ahmed A, Banu S. Nurses knowledge, attitude and practices regarding adverse drug reactions and prescribing cascades reporting in tertiary care hospitals, Peshawar. Ann Allied Health Sci. 2025;11(1):19-25.

INTRODUCTION

The field of medicine has made significant advances that help those who suffer from illnesses to live better lives. One such advance is the development of drugs, which are unique substances that can have both desired and unintended effects. [1] Drugs being the most commonly adopted treatment approach should be used appropriately. When a drug's safety is not properly considered, it can have fatal or have severely impairment-causing effects.[2]

Even though the drug's efficacy and potency have been identified as the most important characteristics, it can also produce some unwanted reactions called ADRs. World Health Organization (WHO) defined ADR as "a response to a drug which is noxious, unintended and which occurs at doses normally used in man for prophylaxis, diagnosis or therapy of disease, or for the modification of physiological function". [2,3]

Worldwide the frequency of emergency hospitalization due to ADRs ranges from 0.2 to 41.3% of which 28.9% are preventable. [3] Doctors and nurses should timely identify and manage these adverse reactions. According to Brat et al.,[4] ADRs are sometimes misdiagnosed as a new medical problem which leads to the addition of a new drug to the treatment plan ,which is known as prescribing cascade. [4] For example, using calcium channel blockers may lead to peripheral edema for which a diuretic may be advised. [5] It is important to identify side effects and potentially inappropriate prescribing cascades because they might result in adverse events, lower patient quality of life, unnecessary medication costs and increased healthcare utilization. [4,6] Typically, nurses are assigned to hospital settings to provide patient care. Pakistan is among the nations where the physician to nurse ratio is 2.7:1, which significantly diminishes the importance of nurses in healthcare environments. In Pakistan nurses are responsible for dispensing medication, following physician directions, and performing other administrative work. [7] Among other health care professionals, nurses are known to play a significant role in ADRs reporting and monitoring. They are an essential and valuable source for voluntary reporting of ADRs in the hospitals. Thus, the attitudes and opinions of nurses regarding voluntary reporting of ADRs and the methodsto address them are of utmost importance. [8] Healthcare professionals should make it a priority to prevent the onset of adverse medication reactions, especially community and clinical health nurses, whose responsibility is the health of patients and safety of community. [9] Nurses' leadership is an important strategy to reduce the problems associated with patient drug reactions. [10] In 2003, Pakistan's national drug policy called for the establishment of a drug surveillance system. Approximately 6.7% of hospitalized patients had severe adverse reactions. If these estimates are correct, then hospitalized patients have more than 2,216,000 severe drug reactions, resulting in more than 106,000 deaths each year.[9] In 2012, another initiative that was taken is the establishment of Drug Regularity Authority of Pakistan (DRAP) to observe medication safety procedures across the country. In 2018, the Punjab government took a step by creating an online portal for reporting ADRs .[11]

Numerous studies have been conducted worldwide to explore the KAP of healthcare professionals regarding ADRs, however limited number of studies have been conducted specifically on nurses' knowledge regarding ADRs and prescribing cascades reporting. A limited literature work on the subject matter is available in Pakistani context. The findings of a study done in Lahore, Pakistan identified poor knowledge and negative attitude of nurses regarding monitoring and reporting of ADRs and pharmacovigilance.[9] Many pharmacists have sufficient knowledge about ADRs, while other health professionals including nurses didn't have adequate knowledge.[12] Prescribing cascade is quite new term that is little known among health care professionals [13] and no studies have been performed to assess the knowledge of nurses about prescribing cascades reporting in Pakistani context. Most of the studies conducted in Pakistan are on health care workers KAP regarding ADRs reporting. So far, there has been limited literature available specifically on nurses KAP regarding ADRs and Prescribing cascades reporting as per the researcher's knowledge.

The purpose of this study was to assess the KAP of nurses regarding ADRs and prescribing cascades reporting in tertiary care hospitals of Peshawar. Thus, insights from the study can lead to the development of more effective reporting and training programs, evidence-based policies which will ultimately facilitate identification and maintenance of prescribing cascades and ADRs reporting. It will also contribute to the advancement of nursing practice in medication safety.

MATERIAL AND METHODS

A descriptive cross-sectional study was conducted between August to October 2024. The study settings were Rehman Medical Institute and Hayatabad Medical Complex, Peshawar. Registered nurses with at least 1-year of clinical experience and who were providing direct care to the patients were included and those who were working at management level were excluded from the study. The participants were selected using convenience sampling techniques. The online sample size calculator, Rao soft was used. Using a 95% confidence interval, 5% margin of error, known population size of 535, the estimated sample size was 224. Twenty added to the sample size (n=224) to overcome non-response. Data was collected through a structured questionnaire after the participants' willingness. Written consent was signed by the participants before filling out the questionnaire.

The predesigned KAP survey questionnaire was adopted from a study conducted in India in 2024. [13] Some of the items in the questionnaire were modified accordingly. Prior to conducting the actual survey, the tool's reliability was evaluated through pilot testing on 20 nurses, and it was adjusted according to the items. The questionnaire with Cronbach's alpha of 0.84 was interpreted as reliable and having internal consistency.

The final questionnaire consists of 4 sections, including demographic information, knowledge of ADRs and prescribing cascades, attitude and practice related to ADRs and prescribing cascades reporting. The first section was comprised of questions related to demographic information. The second part of the questionnaire had 10 items regarding the knowledge of participants. The response for this part was given in the form of multiple-choice questions and "yes" or "no" responses. To calculate the knowledge score, each correct response was given one point, and each incorrect response was given zero. The third section had 10 items to evaluate the attitude of participants on a 5- point Likert scale:1-Strongly disagree, 2-Disagree, 3-Neutral, 4-Agree, 5-Strongly agree. The fourth section of the questionnaire had 8 items to assess practice related to ADRs and prescribing cascades reporting. The overall KAP was categorized based on Bloom's cut-off points. [14]

SPSS version 20 was used for data analysis. Percentages and frequencies were calculated for the variables. Chi-square testing was also applied to find association between knowledge of the participants and socio-demographic characteristics. The participants were informed about the practical significance of the study. Throughout the study, participants' anonymity was ensured, and confidentiality of the data submitted was rigorously upheld.

RESULTS

The study included 224 nurses, with the majority being females (59.4%). Most of the participants' (68.8%) age was below 30, 29.5% were between 31-50 years and only 1.8% were above 50 years. Majority of them (52.7%) had done post-RN, (43.8%) held a BSN degree and only (3.6%) of the participants had completed their MSN. A higher proportion of the participants (75%) had 1-5 years' experience and only (3.1%) had more than 10 years' clinical experience. **(Table 1)**

The overall knowledge of the participants was categorized by using Bloom's cut-off points, as 8 and above being excellent knowledge, between 5 and 7 being average knowledge and <5 being poor knowledge. Majority of the respondents' (54.5%) had average knowledge, (36.6%) had poor knowledge and only (8.9%) had excellent knowledge. The majority participants (80.4%) correctly defined ADRs but most of them (60.7%) were unaware of the classification of ADRs.Few participants (21.4%) knew the term prescribing cascade. Most respondents (70.5%) acknowledged that prescribing cascade is more common in patients on multiple medications. A considerable percentage (71%) were unaware of drugs that have been banned because of a serious adverse reaction. **(Table 2)**

The overall attitude of the participants was categorized using Blooms cut-off points, as 40 and above being positive attitude, between 25 and 39 being ambivalent attitude and <25 being negative attitude. The study found that majority of the participants (57.1%) had ambivalent attitude and only (8.1%) had positive attitude towards ADRs and prescribing cascades. A considerable percentage of respondents (83.5%) admitted that reporting ADRs is their professional responsibility. The mandatory reporting of ADRs was deemed acceptable by a significant majority (81.7%). Around (71.4%) of participants were willing to integrate ADRs reporting and monitoring in their practice. **(Table 3)**

The Overall practice of the participants was classified using modified Blooms cut off points, as 33 to 40 being good practice, between 21 to 32 being inconsistent practice and <20 being poor practice. Majority of the participants (65.2%) had poor practices related to ADRs and Prescribing cascades. 52.2% reported that they haven't reported ADRs during their practice Moreover, (41.1%) agreed that under reporting due to the belief that all marketed medications are safe as they have undergone clinical trials. Most of the participants (49.6%) have not identified prescribing cascades during their practice and only (11.1%) revealed that they have filled in an ADRs reporting form. **(Table 4)**

Chi square test was employed to find significant association between knowledge category and demographic variables. Knowledge of ADRs and prescribing cascades was significantly associated with the age and years of experience of the participants with a P value of 0.009 and P value of 0.038 respectively.

Table 1: Demographic information of the participants

Variables	Frequency	Percentage
Age		
Below 30	154	68.8
31-50 years	66	29.5
Above 50 years	4	1.8
Gender		
Female	133	59.4
Male	91	40.6
Experience		
1-5 years	168	75
6-10 years	49	21.9
>10 years	7	3.1
Education level		
Post-RN	118	52.7
BSN	98	43.8
MSN	8	3.6
Marital Status		
Married	97	43.3
Unmarried	127	56.7
Hospital		
Hospital A	58	25.9
Hospital B	166	74.1

Table 2: Respondents' knowledge regarding ADRs and prescribing cascades

Q.no	Question	Percentage (%)	
		Correct Response	Incorrect Response
1	What is an adverse drug reaction?	80.4	19.6
2	How do you classify ADRs?	39.3	60.7
3	What type of ADRs should be reported?	51.3	48.7
4	Which organization in Pakistan is responsible for ADRs Reporting?	71.9	28.1
5	What is the term used for misinterpreting an ADR as a new medical condition and prescribing a new drug?	21.4	78.6
6	Awareness of any drugs that have been banned because of a serious adverse drug reaction, name any.	29.0	71.0
7	Is there a chance that the adverse drug reaction will be misdiagnosed as a new medical problem	60.3	39.7
8	Awareness of any official reporting system in other countries, name any.	17.4	82.6
9	The cascade of prescription is common among the elderly population.	66.1	33.9
10	Prescribing cascade is more common in patients on multiple medications.	70.5	29.5

Table 3: Attitude of nurses towards ADRs and PC reporting

Item	Description	Percentage		
		Disagree	Neutral	Agree
1	Reporting adverse drug reactions is my professional responsibility.	10.7	5.8	83.5
2	ADRs reporting should be made mandatory.	9.8	8.5	81.7
3	Each patient should be made aware of possible adverse drug reactions every time they receive medicine.	9.8	18.8	71.5
4	Frequent monitoring of medication related adverse drug reactions is necessary to improve patient care.	10.7	11.2	78.1
5	ADR reporting is time consuming.	48.7	20.5	30.8
6	The concept of prescribing cascades should be taught in the course curriculum.	13.9	22.3	63.8
7	Avoiding prescribing cascades in patients is my professional responsibility.	24.1	15.2	52.7
8	The prescribing cascade increases the financial burden on patients.	24.1	21.0	54.9
9	Are you willing to incorporate ADRs reporting in your practice.	13.9	14.7	71.4
10	Voluntary reporting of ADRs by patients is necessary.	11.2	25	63.9

Table 4: Practices regarding ADRs and prescribing cascades reporting

Item	Description	Percentage		
		Disagree	Neutral	Agree
1	I have reported an ADR during my practice	52.2	11.2	36.6
2	I am following protocols to prevent ADRs in my practice	37	14.7	48.3
3	I mention the ADRs on patients reports	50.9	18.3	30.8
4	I have done ADRs reporting at least once in the past 1 year	61.6	24.6	13.9
5	ADRs are not reported because of the belief that all marketed drugs are safe	41	17.9	41.1
6	I have identified prescribing cascades during my practice	49.6	31.3	19.2
7	Patients with new medical condition or symptoms after receiving medications was reported by me during my practice	28.6	21.0	50.5
8	I have filled an ADR reporting form	78.1	10.7	11.1

DISCUSSION

Nurses play an essential role in ADRs reporting and identification. Compared with other health care professionals' nurses spend most of their time with patients by providing them with care and administering their medications. Thus, they are the ones who can easily identify ADRs and prescribing cascades. [15] The findings of the current cross-sectional study indicate that nurses had average knowledge regarding ADRs and prescribing cascades and about 80.4% of the participants correctly defined ADRs. These findings are inconsistent with previous studies done in Pakistan and Nepal which have demonstrated that nurses had poor knowledge regarding ADRs. [9,16] This study revealed that nurses had little knowledge on ADRs classification and only 39.3% knew about the classification which is relatively low percentage. These findings are somehow comparable with a study conducted in India which revealed that only 17.8% participants knew about the classification. ADRs future consequence is prescribing cascade, which is correctly defined by 21.7% of our study participants. Similar findings have been reported in India where only 15.6% nursing students knew the term prescribing cascade. [13] Majority of the participants of the current study (51%) believed that all types of ADRs should be reported whether they are related to vaccines, homeopathic drugs or any serious ADRs. Similar findings were also reported by a study conducted in Turkey which found that 59% nurses believed that all severe and unpredictable ADRs associated with old and new drugs should be reported and 57% believed that ADRs related to vaccines should also be reported. [17]
In the current study, 71.9% participants knew about ADRs reporting organization in Pakistan. This was considerably higher than results of the Palaian et al.[15] whose findings suggested that 41% of Nepali healthcare workers knew about ADRs reporting organization in their country.[15] Unawareness of the regional ADRs reporting organization might act as factor for underreporting ADRs among the HCPs. [17]
The attitude of nurses is thought to be important for ADRs reporting, thus a positive attitude may promote timely reporting. The current study found that nurses had an ambivalent attitude towards ADRs and prescribing cascades reporting. These findings were not consistent with the previous research by Hussain et al.[18] which showed that nurse's attitude towards ADRs reporting was positive.[18] It was encouraging to see that majority of the nurses 71.4% were willing to implement reporting in their practice and 83.5% considered ADRs reporting as their professional responsibility. These findings were consistent with the previous studies conducted in Pakistan and Qatar. [11,19]
The findings of this study demonstrated that only 11.1% of nurses have filled in an ADR reporting form. In contrary, a study conducted in India revealed that 54.5% nurses have completed an ADR reporting form and reported to the institution. [20] Majority of the participants 65.2% exhibited poor practices regarding ADRs reporting. The results were consistent with the previous studies done in Nepal and Ethiopia which found that most of the HCPs had poor practices for ADRs reporting. [21, 22]
Research on nurses' understanding and reporting of ADRs and prescribing cascades is relatively limited in Pakistan, especially in Peshawar as per the researcher's knowledge. So, this study contributes valuable data that could help bridge gaps in knowledge, raise awareness, and inform interventions to improve ADR reporting systems in the region. The tool used for the current study was pilot tested and was reliable. This study was conducted in 2 tertiary care hospitals of Peshawar, due to which the generalizability of the finding to the broader population of nurses may be affected. Although we acknowledge that direct practice observation is important due to time constraints, we had to gather data using a Likert-scale.
This study recommends that ADRs and prescribing cascades reporting should be taught in the course curriculum for better understanding and implementation. Comprehensive training programs on ADRs reporting and prescribing cascades should be arranged in hospitals to train the nurses about how and where to report an ADR and how to prevent prescribing cascades.

CONCLUSION

This study concluded that nurses have average knowledge, ambivalent attitude and poor practices regarding ADRs and prescribing cascades reporting. This gap indicates a significant need for improved education and supportive policies to enable nurses to apply their knowledge and attitude into effective practices. Addressing these challenges is necessary for improving medications safety and patient outcomes. Educational training, clear reporting protocols and interdisciplinary teamwork are essential to enhance medication safety and reporting system in tertiary care hospitals.

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