

KNOWLEDGE, ATTITUDE, AND PRACTICE TOWARDS ADVERSE DRUG REACTION DETECTION AND REPORTING AMONG NURSES AT A PRIVATE MEDICAL COLLEGE IN BANGLADESH: A CROSS-SECTIONAL STUDY

Nazla Shamsuddoha^{1*}, Sarah Ahmed Tamanna², Saba Md. Rezwanur Rahman³, Fatema Ershad⁴, Khadiza Diluara⁵, Sultana Aktia Islam¹, Rahnuma Ahmad⁶, Sumaiya Nousheen⁷, Roksana Parvin¹, Nusrat Sultana¹, Rifat Naoreen Islam⁸.

OPEN ACCESS

Reviewed by

Shayla Haque

Enam Medical College & Hospital
Savar, Dhaka, Bangladesh.

Shahtina Shams

United Medical College & Hospital
Dhaka, Bangladesh.

* Correspondence

Nazla Shamsuddoha

E-mail: dr.nazlashamsuddoha@gmail.com

Orcid id: <https://orcid.org/0009-0006-7203-4383>

Received: 29.03.2026

Accepted: 09.06.2026

Published: July 2026

Cite this article:

Shamsuddoha N, Tamanna SA, Rahman SMR, Ershad F, Diluara K, Islam SA, Ahmad R, Nousheen S, Parvin R, Sultana N, Islam RN. Knowledge, Attitude, and Practice toward Adverse Drug Reaction Detection and Reporting Among Nurses at a Private Medical College in Bangladesh: A Cross-Sectional Study. J Med Coll Women Hosp. 2026; 22(2): 91-99.

ABSTRACT

Background: Reporting adverse drug reactions (ADRs) is essential for ensuring medicine safety and protecting patients from preventable harm. Nurses are well positioned to detect and report ADRs, but underreporting remains common. **Objective:** This study assessed registered nurses' knowledge, attitudes, and practices regarding ADR detection and reporting at a private medical college hospital in Bangladesh. **Materials and Method:** This hospital-based descriptive cross-sectional study was conducted from September 2021 to February 2022 among 50 registered nurses selected by convenience sampling. The sample size was calculated using the single population proportion formula based on a previously reported ADR reporting rate of 12.0%, with 95% confidence level, 10% absolute precision, and 10% allowance for non-response. Data were collected through a structured questionnaire adapted from relevant literature, reviewed for validity, pretested, and assessed for internal consistency of the attitude section using Cronbach's alpha. Knowledge, attitude, and practice were classified using predefined scoring criteria. Data were analyzed using SPSS version 25.0, with chi-square or Fisher's exact test used to examine associations, with statistical significance set at $p < 0.05$. **Results:** More than half of the nurses (56.0%) were aged 20-30 years, and 58.0% had at least five years of clinical experience. Most participants correctly identified the definition of ADR (78.0%) and were aware of pharmacovigilance (62.0%); however, only 36.0% knew about the ADR reporting form and 30.0% knew the appropriate reporting authority. Overall, 44.0% had good knowledge, 34.0% had moderate knowledge, and 22.0% had poor knowledge. A positive attitude toward ADR reporting was observed in 82.0% of participants. Although 68.0% had observed an ADR during clinical practice, only 4.0% had formally reported one (95% exact CI: 0.5%-13.7%), and only 24.0% had received training on ADR reporting. **Conclusion:** Despite generally positive attitudes and moderate knowledge, ADR reporting practice was extremely low. Regular training, clear institutional reporting procedures, and stronger pharmacovigilance systems are needed to improve reporting behavior among nurses.

Keywords: Adverse drug reactions (ADR), Pharmacovigilance, Nurses, Knowledge, Attitude, Practice, Bangladesh.

1* Department of Pharmacology & Therapeutics, Medical College for Women & Hospital, Dhaka, Bangladesh.

E-mail: dr.nazlashamsuddoha@gmail.com, Orcid id: <https://orcid.org/0009-0006-7203-4383> [Corresponding Author]

2 Department of Community Medicine, Medical College for Women & Hospital, Dhaka, Bangladesh.

3 Department of Community Medicine, Mainamoti Medical College & Hospital, Dhaka, Bangladesh.

4 Department of Pharmacology & Therapeutics, Addin Women's Medical College, Dhaka, Bangladesh.

5 Department of Biochemistry, President Abdul Hamid Medical College, Dhaka, Bangladesh.

6 Department of Physiology, Medical College for Women & Hospital, Dhaka, Bangladesh.

7 Department of Pharmacology & Therapeutics, Holy Family Red Crescent Medical College, Dhaka, Bangladesh.

1 Department of Pharmacology & Therapeutics, Medical College for Women & Hospital, Dhaka, Bangladesh.

8 Department of Forensic Medicine, Medical College for Women & Hospital, Dhaka, Bangladesh.

INTRODUCTION

Modern medicines have transformed disease prevention and treatment and have contributed to improved outcomes across a wide range of clinical conditions¹. However, no medicine is completely free from the risk of unwanted or harmful effects^{2,3}. The World Health Organization (WHO) defines an adverse drug reaction (ADR) as a harmful and unintended response to a drug that occurs at doses normally used for prevention, diagnosis, or treatment of disease⁴⁻⁷.

ADRs are recognized as an important global public health problem and remain a major cause of morbidity, mortality, prolonged hospitalization, and increased healthcare expenditure^{4,8,9}. Previous studies have reported that ADRs account for approximately 2.9% to 10.0% of hospital admissions worldwide and may increase length of hospital stay by 9.0% to 20.0%^{2,4,8,10}. In addition to clinical consequences, ADRs impose financial and psychological burdens on patients, families, and health systems^{1,8,11}.

Pharmacovigilance helps healthcare systems recognize, evaluate, and prevent harmful or unintended effects of medicines.^{8,11,12}. The success of any pharmacovigilance system depends on active participation by healthcare professionals, including nurses. Because nurses remain in close and continuous contact with patients, they are often among the first healthcare providers to observe both expected and unexpected ADRs in routine clinical practice^{6,8}.

Despite this important role, ADRs are grossly underreported worldwide. Some studies suggest that only 6.0% to 10.0% of ADRs are reported^{6,8,12}. In some settings, including India, reporting rates have been estimated at less than 1.0%^{8,9}. Underreporting is commonly associated with gaps in healthcare professionals' knowledge, attitude, and practice (KAP) regarding ADR detection and reporting^{8,11,12}. Reported barriers include lack of time, fear of legal consequences, uncertainty about causality, limited awareness of reporting systems, and inadequate training^{1,4,6,8}.

Although several studies have examined pharmacovigilance-related KAP among nurses internationally, local institutional data are needed to identify context-specific barriers and training needs^{2,12}. In Bangladesh, available evidence remains limited, particularly among nurses working in private medical college hospitals. Therefore, this study assessed knowledge, attitude, and practice toward ADR detection and reporting among nurses at a private medical college hospital in Bangladesh, with the aim of identifying educational and system-level gaps that may be addressed to improve patient safety.

MATERIALS AND METHOD

This hospital-based descriptive cross-sectional study was conducted at Anwar Khan Modern Medical College and Hospital in Dhaka, Bangladesh, from September 2021 to February 2022. It explored registered nurses' knowledge, attitudes, and practices regarding adverse drug reaction detection and reporting. Female registered nurses working in the hospital's inpatient departments were eligible to participate if they had at least six months of clinical experience and provided written informed consent. Nursing students, interns, and nurses who were on leave during data collection were excluded. The sample size was estimated using the single population proportion formula, $n = Z^2pq/d^2$. The expected ADR reporting practice was taken as 12.0%, based on a previous study among nurses in Bhopal, India. Considering a 95% confidence level, 10% absolute precision, and 10% non-response allowance, the minimum required sample size was about 45. A total of 50 registered nurses were ultimately included.

Participants were recruited through convenience sampling based on their availability during the study period. Although this approach was feasible for the institutional setting, it limits the generalizability of the findings and is acknowledged as a methodological limitation. Data were collected using a structured, self-administered questionnaire developed after reviewing previously published studies on ADR reporting and pharmacovigilance practices. Relevant items were adapted according to the local hospital context. The questionnaire contained four sections: socio-demographic information, knowledge related to ADR detection and reporting, attitudes toward ADR reporting, and practices concerning ADR detection and reporting.

The draft questionnaire was reviewed for face and content validity by subject experts in pharmacology/public health and nursing. Before final data collection, the questionnaire was pretested among a small group of nurses who were not part of the final study to check clarity, wording, comprehension, and feasibility. Based on pretest feedback, minor wording and formatting modifications were made before final administration. Internal consistency reliability was assessed for the Likert-scale attitude section using Cronbach's alpha, and the attitude section demonstrated excellent internal consistency (Cronbach's alpha = 0.910).

To minimize bias, participants were informed that participation was voluntary, responses would remain confidential, and no identifying information would be reported. Questionnaires were completed independently, and data were checked for completeness and consistency before analysis. Nevertheless, recall bias and social desirability bias could not be completely excluded because the data were self-reported. Ethical approval/institutional permission were obtained from the appropriate institutional authority, with institutional reference number JMCWH/374. Written informed consent was obtained from all participants before data collection, and confidentiality was maintained throughout the study.

For the knowledge section, each correct answer was given a score of 1, while incorrect answers were scored as 0. The maximum possible knowledge score was 4. Based on the total score, knowledge was classified as good for scores of 3–4, moderate for a score of 2, and poor for scores of 0–1. Attitude was assessed using a 5-point Likert scale, ranging from strongly disagree (1) to strongly agree (5). The total attitude score was then categorized as positive (≥ 19), neutral (13–18), or negative (≤ 12). Practice-related questions were scored as 1 for “Yes” and 0 for “No,” and the findings were presented descriptively.

All collected data were entered, checked for completeness and accuracy, and analyzed using SPSS version 25.0. Categorical variables were presented as frequencies and percentages. Associations between selected categorical variables were examined using the chi-square test, while Fisher's exact test was used when expected cell counts were less than five. A 95% exact binomial confidence interval was calculated for the proportion of nurses who had formally reported ADRs. A p-value of less than 0.05 was considered statistically significant.

RESULTS

The study included 50 registered nurses. Of them, 56.0% were aged 20–30 years, 64.0% had completed a diploma in nursing, and 58.0% had at least five years of clinical experience (Table-1).

Table 1: Socio-demographic characteristics of participating nurses (N = 50)

Variables	Category	n	%
Age group (years)	20–30	28	56.0
	31–40	17	34.0
	>40	5	10.0
Educational qualification	Diploma in Nursing	32	64.0
	BSc in Nursing	18	36.0
Work experience	<5 years	21	42.0
	≥5 years	29	58.0

N=Total number of participating nurses; n=number of nurses in each category

Knowledge Regarding ADR Detection and Reporting

Table 2 shows that 78.0% of participants correctly understood the definition of ADR, and 62.0% were aware of pharmacovigilance. However, only 36.0% knew about the ADR reporting form and 30.0% knew the appropriate reporting authority. Based on cumulative scoring, 44.0% demonstrated good knowledge, 34.0% had moderate knowledge and 22.0% had poor knowledge (Table 3).

Table 2: Knowledge regarding ADR detection and reporting (N = 50)

Knowledge item	Correct response (%)
Correctly identified ADR definition	39 (78.0)
Aware of pharmacovigilance	31 (62.0)
Knowledge of ADR reporting form	18 (36.0)
Knowledge of reporting authority	15 (30.0)

N=Total number of participating nurses

Table 3: Overall knowledge level based on cumulative scoring (N=50)

Knowledge level	Score range	n	%
Good	3–4	22	44.0
Moderate	2	17	34.0
Poor	0–1	11	22.0

N=Total number of participating nurses

Attitude toward ADR Detection and Reporting

Overall, participants expressed favorable attitudes toward ADR reporting. The majority agreed that ADR reporting improves patient safety and is a professional responsibility (Table 4). Based on cumulative scoring, 82% demonstrated a positive attitude (Table 5).

Table 4: Attitude toward ADR detection and reporting (N = 50)

Attitude Statement	Agree/Strongly Agree n (%)
ADR reporting improves patient safety	41 (82.0)
ADR reporting is a professional responsibility	38 (76.0)

Attitude Statement	Agree/Strongly Agree n (%)
All suspected ADRs should be reported	36 (72.0)
Reporting ADRs contributes to safer medication use	40 (80.0)
ADR reporting should be mandatory in hospitals	37 (74.0)

N=Total number of participating nurses

Table 5. Overall attitude level classification (N=50)

Attitude Level	Score range	n	%
Positive	≥19	41	82.0
Neutral	13–18	7	14.0
Negative	≤12	2	4.0

N=Total number of participating nurses; n=number of participants in each category

Practice Regarding ADR Detection and Reporting

Although 68.0% of nurses had observed ADRs during clinical practice, only 2 out of 50 nurses had formally reported an ADR. Thus, the formal ADR reporting rate was 4.0% with a 95% exact binomial confidence interval of 0.5%–13.7%. In addition, only 24.0% of participants had received formal training related to ADR detection and reporting (Table 6).

Table 6: Practice Regarding ADR Detection and Reporting (N = 50)

Practice Item	Yes n (%)	No n (%)
Ever observed ADR	34 (68.0)	16 (32.0)
Ever reported an ADR	2 (4.0)	48 (96.0)
Received ADR training	12 (24.0)	38 (76.0)

Note: The formal ADR reporting rate was 4.0% (2/50), with a 95% exact binomial confidence interval of 0.5%–13.7%.

Factors Associated with ADR Reporting

ADR reporting was numerically higher among nurses with good knowledge, positive attitude, and prior ADR training; however, these associations were not statistically significant (Tables 7-9). Educational qualification was significantly associated with knowledge level ($p = 0.037$), with BSc-qualified nurses demonstrating better knowledge than diploma holders (Table 10). Because only two participants had ever reported an ADR, statistical power was limited and inferential results should be interpreted with caution.

Table 7. Association between Knowledge Level and ADR Reporting Practice

Knowledge level	Reported ADR n (%)	Not reported n (%)	p-value
Good (n = 22)	2 (9.1)	20 (90.9)	>0.05
Moderate/Poor (n = 28)	0 (0.0)	28 (100.0)	

Fisher's exact test was used.

Table 8. Association between attitude level and ADR reporting

Attitude level	Reported ADR n (%)	Not Reported n(%)	p-value
Positive (n=41)	2 (4.9)	39 (95.1)	>0.05
Neutral/Negative (n=9)	0 (0.0)	9 (100.0)	

N=Total number of participating nurses;n=number of participant in each category; %=percentage; ADR=Adverse Drug Reaction

Table 9. Association between ADR training and reporting practice (N=50)

ADR training	Reported ADR n(%)	Not reported n(%)	p-value
Yes (n=12)	2 (16.7)	10 (83.3)	>0.05
No (n=38)	0 (0.0)	38 (100.0)	

N=Total number of participating nurses;n=number of participant in each category; %=percentage; ADR=Adverse Drug Reaction

Table 10. Association between educational qualification and knowledge level (N=50)

Education	Good knowledge n (%)	Moderate/Poor n (%)	p-value
BSc (n=18)	12 (66.7)	6 (33.3)	0.037
Diploma (n=32)	10 (31.3)	22 (68.7)	

N=Total number of participating nurses;n=number of participant in each category; %=percentage; ADR=Adverse Drug Reaction

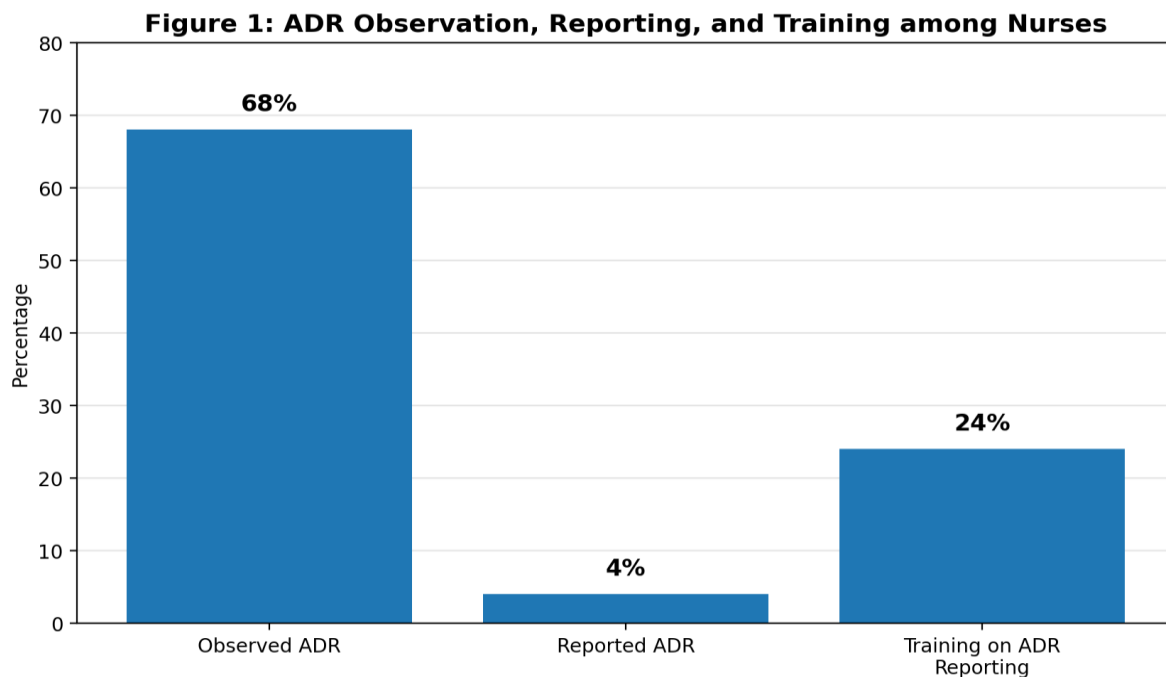


Figure 1: ADR Observation, Reporting, and Training among Nurses. ADR=Adverse Drug Reaction

Figure 1 illustrates the discrepancy between ADR observation, reporting, and training exposure. It highlights the substantial reporting gap: although 68.0% of nurses had observed ADRs, only 4.0% had formally reported an ADR.

DISCUSSION

This study explored nurses' knowledge, attitudes, and practices related to ADR detection and reporting at a private medical college hospital in Bangladesh. The findings revealed a clear gap between awareness and actual reporting practice. Although most nurses showed a favorable attitude toward ADR reporting, this positive attitude was not reflected in their reporting behavior.

In this study, 44.0% of nurses had good knowledge regarding ADR detection and reporting. This proportion is higher than that reported among healthcare professionals in selected public hospitals in Northeast Ethiopia (24.56%)¹ and is comparable to findings from Bhopal, India (40.0%)⁸. However, practical knowledge remained limited. Only 30.0%-36.0% of participants knew about the reporting authority or reporting form. Similar procedural gaps have been reported elsewhere. In South Africa, more than half of participants did not know the actual procedure for submitting an ADR report¹³, while a South Indian study found that none of the nurses were aware of their regional ADR reporting center⁶. In Saudi Arabia, although many healthcare professionals were aware of hospital-level reporting systems, knowledge of the national pharmacovigilance center was lower⁴.

Attitude toward ADR reporting was predominantly positive in this study, with 82% of participants classified as having a favorable attitude aligns closely with global trends where nurses view ADR reporting as a professional obligation^{11,13}. Studies in India reported a 90% positive attitude among nursing staff⁸. In Ethiopia, 87.7% of respondents agreed that ADR reporting should be part of their clinical duty¹. This suggests that the worldwide failure to report ADRs is not an attitudinal problem but rather a failure of systems and operational training^{6,13}.

The most striking finding of this study is the marked discrepancy between ADR observation (68%) and formal reporting (4%). Although a majority of nurses had encountered ADRs in clinical practice, only a very small proportion proceeded to report them. This 4% reporting rate is considerably lower than figures documented in other regions. For example, a study conducted in Bhopal, India reported that 70% of nurses had encountered ADRs, while 12% had reported them⁸. Similarly, reporting rates of 11.1% in South India⁶, 18.9% in South Africa¹³, and 14.91% in Ethiopia¹ have been documented. The consensus in the sources is that ADRs are grossly underreported⁸. Globally, it is estimated that only 6% to 10% of all ADR cases are ever reported^{9,12}, and in some regions like India, the rate is estimated to be less than 1%^{8,9}.

The present study demonstrated that BSc-qualified nurses possessed significantly higher knowledge levels compared to diploma holders ($p = 0.037$). This finding is consistent with evidence from Nepal, where nurses with master's-level qualifications answered knowledge-based questions correctly far more frequently (86.18%) than those with lower academic credentials¹⁰. These findings suggest that higher educational attainment may enhance understanding of pharmacovigilance concepts and ADR reporting procedures.

Additionally, only 24% of participants in this study had received formal training on ADR detection and reporting. Comparable findings have been reported in other settings, including Saudi Arabia (25%)⁴ and South Africa (23.8%)¹³, where similarly low proportions of nurses had undergone formal training. In Ghana, although 41.6% of nurses reported receiving in-service training, 75.2% still lacked adequate knowledge regarding the specific information required for completing an ADR reporting form¹⁴. Collectively, these findings highlight that

both limited training coverage and insufficient training depth may contribute to persistent knowledge and practice gaps in ADR reporting.

Overall, the findings indicate that although nurses acknowledge the importance of ADR reporting, systemic and educational barriers limit its translation into practice. Similar to global trends, nurses appear willing but insufficiently prepared and supported, with the main challenge being the shift from theoretical knowledge to practical reporting. Addressing this gap requires strengthening pharmacovigilance content in nursing curricula, ensuring easy access to reporting tools and clear protocols, implementing regular in-service training, and establishing feedback mechanisms to promote a sustainable reporting culture.

LIMITATIONS

This study has several limitations. Although the calculated minimum sample size was achieved, the sample was modest and participants were selected from a single private hospital using convenience sampling, which may limit generalizability. The very small number of nurses who had formally reported ADRs reduced the statistical power to detect significant associations. In addition, the use of self-reported data may have introduced recall bias and social desirability bias. Because of the cross-sectional design, causal relationships could not be established.

CONCLUSION

Despite moderate knowledge and generally positive attitudes, ADR reporting practice among nurses was very low. Educational qualification was associated with knowledge level, while limited formal training may have contributed to underreporting. Regular pharmacovigilance training, clearer institutional reporting procedures, simplified reporting systems, and supportive feedback mechanisms are needed to improve ADR reporting and strengthen patient safety.

CONFLICT OF INTEREST

There is no conflict of interest.

REFERENCES

1. Kassa Alemu B, Biru TT. Health Care Professionals' Knowledge, Attitude, and Practice towards Adverse Drug Reaction Reporting and Associated Factors at Selected Public Hospitals in Northeast Ethiopia: A Cross-Sectional Study. *Biomed Res Int*. 2019;2019:8690546. doi: 10.1155/2019/8690546.
2. Mn S, Banavalikar N. Knowledge, attitude and practice of adverse drug reaction monitoring and reporting among nurses of secondary healthcare. *Int J Basic Clin Pharmacol*. 2016;1574–9. doi:10.18203/2319-2003.ijbcp20162475
3. Srinivas M, Sharma SN, Holla R. Knowledge, attitude and practice of medical professionals towards adverse drug reaction reporting and pharmacovigilance in a tertiary care hospital: a cross sectional study. *Int J Basic Clin Pharmacol*. 2018;7(3):486. doi:10.18203/2319-2003.ijbcp20180662
4. AlShammari TM, Almoslem MJ. Knowledge, attitudes & practices of healthcare professionals in hospitals towards the reporting of adverse drug reactions in Saudi Arabia: A multi-centre cross sectional study. *Saudi Pharm J*. 2018;26(7):925-931. doi: 10.1016/j.jsps.2018.04.012.
5. Alomar MJ. Factors affecting the development of adverse drug reactions (Review article). *Saudi Pharm J*. 2014;22(2):83-94. doi: 10.1016/j.jsps.2013.02.003.

6. Krishnegowda S, B P, Udaykumar P, Thomas T. Knowledge, attitude, and practice of adverse drug reaction reporting among nurses in a South Indian tertiary health-care center. *Natl J Physiol Pharm Pharmacol.* 2017;7(2):1. doi:10.5455/njppp.2017.7.0823819082016
7. Kefale AT, Tefera BD, Biru TT. Knowledge, Attitude And Practice Of Healthcare Professionals Towards Adverse Drug Reaction Reporting At Inpatient Wards Of Tertiary Hospital, Ethiopia. *J Drug Delivery Ther.* 2017;7(4):97–102. doi:10.22270/jddt.v7i4.1483
8. Tiwari A, Chitapure F, Mishra A, Hindoliya M. A study on the knowledge, attitude, and practice on adverse drug reactions and pharmacovigilance among nursing staff. *Natl J Physiol Pharm Pharmacol.* 2022;(0):1. doi:10.5455/njppp.2023.13.12439202117082022
9. Gafoor A, Mutha AS, Sahai J, Sankpal JT. Knowledge, attitude and practice study on pharmacovigilance among nursing students and staff before and after a training session at a tertiary care hospital in India. *Int J Basic Clin Pharmacol.* 2025;14(4):492–8. doi:10.18203/2319-2003.ijbcp20251832
10. Shah RC, Sinha R, Mishra C, Kumal JPP. Knowledge, Attitude and Practice of Adverse Drug Reactions (ADRS) Reporting in Nursing Staffs of Tertiary Care Hospital. *Med J Eastern Nep.* 2022;1(02):38–43. doi:10.3126/mjen.v1i02.51162
11. Tekel MT, Bekalu AF, Sema FD. Knowledge, Attitude, and Practice of Medical, Pharmacy, and Nursing Students Towards Pharmacovigilance and Adverse Drug Reaction Reporting at University of Gondar College of Medicine and Health Sciences, Northwest Ethiopia: A Cross-Sectional Study. *Adv Med Educ Pract.* 2021;12:1129-1139. doi: 10.2147/AMEP.S327739.
12. Ghazala Z, Kalshetty P, Vardhamane S. Knowledge, attitude and practices towards pharmacovigilance among health care professionals in a teaching and general hospital of South India. *Int J Basic Clin Pharmacol.* 2019;8(2):289. doi:10.18203/2319-2003.ijbcp20190091
13. Bogolubova S, Padayachee N, Schellack N. Knowledge, attitudes and practices of nurses and pharmacists towards adverse drug reaction reporting in the South African private hospital sector. *Health SA.* 2018;23:1064. doi: 10.4102/hsag.v23i0.1064.
14. Adu-Gyamfi PKT, Mensah KB, Ocansey J, Moomin A, Danso BO, Agyapong F, et al. Assessment of knowledge, practices, and barriers to pharmacovigilance among nurses at a teaching hospital, Ghana: a cross-sectional study. *BMC Nurs.* 2022;21(1):242. doi: 10.1186/s12912-022-00965-4.