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Assessment of Knowledge, Attitudes and Practices on Adverse Drug Reaction (ADR)-Reporting by Healthcare Professionals in Selected Health Facilities in Bushenyi District

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Abstract

Background: Adverse drug reactions are currently the sixth biggest cause of death worldwide. In sub-Saharan Africa, Adverse drug reactions account for 6.3% of all hospital admissions. Spontaneous reporting of ADRs is the most commonly used in Sub-Saharan Africa. **Aim:** To assess knowledge, attitudes and practices on Adverse Drug Reaction (ADR)-reporting by healthcare professionals in selected health facilities in Bushenyi District. **Method:** A cross-sectional study was used in ten randomly selected health facilities including, Comboni Hospital Kyamuhunga, Ishaka Adventist Hospital, Bushenyi HC IV, Kyabugimbi HC IV, Kyeizoba HC III, Bushenyi Uganda Prisons HC III, Nyabubare HC III, Kakanju HC III, Kabushaho HC III, Ankole Tea Factory HC II. These health facilities are located in Bushenyi District in Western Uganda region. The sample size was determined using Solven's formula. Participants were selected using purposive and simple random sampling techniques. Data collection was done using adapted pre-tested questionnaires and data analysis was performed using SPSS computer version 25.0.

Keywords: *Adverse drug reaction, Healthcare professional, Cross-sectional study, Bushenyi district, Soven's formula*

1. Introduction

1.1. Background

World Health Organization (WHO) defines an Adverse Drug Reaction (ADR) as, "a response to a drug that is

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noxious, unintended and occurs at doses usually used in man for the prophylaxis, diagnosis, therapy of disease, or for modification of physiological function." (Schmiedl *et al.*, 2018; Talisuna *et al.*, 2006).

In most parts of the world, ADRs cause morbidity and mortality, which is a major threat to public health. Healthcare professionals around the world should therefore be encouraged to report ADRs in a quest to ensure patient safety.

Some studies done both in the USA and the countries in the European Union suggest that ADR reporting has been emphasized as a professional obligation for healthcare professionals and is therefore mandatory, however in some parts it's still voluntary (Jose and Rafeek, 2019)

In most parts of the world, Spontaneous Reporting System is the most common form of reporting ADRs used by healthcare professionals (Paudyal *et al.*, 2020). In this form of reporting, healthcare professionals identify and report any suspected ADRs to their national pharmacovigilance centers or to the manufacturers. This form of reporting has been made mandatory in most countries in the European Union to improve pharmacovigilance.

Therefore, the USA and European Union countries have established a sophisticated pharmacovigilance system that allows real-time monitoring, evaluation and reporting of ADRs while the Uganda pharmacovigilance system is still in its infancy and faces various challenges such as limited resources, lack of training and awareness by the healthcare professionals, unclear roles and poor coordination of activities. Furthermore, the pharmacovigilance system in Uganda being voluntary, healthcare professionals may not be compelled enough to report ADRs. Some findings have shown that the national statistics for voluntary ADR reporting in Uganda indicate that only 0.44% of healthcare professionals report ADRs annually (Kiguba *et al.*, 2015).

In a study to ascertain the extent of ADR reporting and associated factors among healthcare professionals (HCPs) conducted in Mulago National Referral and Teaching Hospital in Uganda revealed that only about 16.6% of the 77.2% respondents had ever reported an ADR. The study also found that only a small percentage of the healthcare professionals knew where to report ADRs and what tools to use in doing so. Healthcare professionals identified a lack of training as one of the main barriers to ADR reporting. As a result, this study came to a conclusion that the increased under reporting of ADRs in Uganda is as a result of healthcare professionals' inadequate training and knowledge of the existent pharmacovigilance and ADR reporting systems (Katusiime *et al.*, 2015; 2016).

Healthcare professionals play a crucial role in identifying ADRs and reporting them so as to ensure patient safety since ADRs are a major concern for public health. Healthcare professionals' knowledge, attitudes, and practices regarding ADR reporting, however, have an impact on how often they report ADRs (AlShammari and Almoslem, 2018; Seid *et al.*, 2018). Despite initiatives to enhance ADR reporting in Uganda using a variety of systems, it is still unclear what knowledge, attitudes and practices healthcare professionals in Uganda have regarding ADR reporting (Katusiime *et al.*, 2015; Kiguba *et al.*, 2015).

According to some studies, the knowledge and awareness of ADR reporting and pharmacovigilance systems among healthcare professionals in Uganda is low. Some healthcare professionals may not recognize the importance of ADR reporting or may lack the necessary training to identify and report ADRs. Additionally, healthcare professionals may have concerns about the time and resources required to report ADRs (Dorji *et al.*, 2016; Katusiime *et al.*, 2015). Healthcare professionals' attitudes toward ADR reporting can also influence their reporting practices. Negative attitudes towards reporting, such as fear of blame or retaliation, can discourage healthcare professionals from reporting ADRs. Lack of feedback from the regulatory authorities may also contribute to negative attitudes towards ADR reporting (Kiguba *et al.*, 2015).

The reporting practices of healthcare professionals can also be influenced by various factors, such as workload, patient volume, and access to reporting systems. Healthcare professionals may not report ADRs if they perceive it as an additional burden or if they lack access to reporting systems (Katusiime *et al.*, 2015; 2016).

Understanding healthcare professionals' knowledge, attitudes and practices regarding ADR reporting is therefore critical to improving ADR reporting and ensuring patient safety in Ugandan healthcare facilities.

Efforts should be made to increase awareness and education on ADR reporting among healthcare professionals and to address negative attitudes towards reporting. Additionally, reporting systems should be made more accessible and user-friendly to encourage healthcare professionals to report ADRs.

1.2. Statement of the Problem

Adverse Drug Reactions (ADRs) pose a significant risk to patient safety, potentially leading to hospitalization, disability, or even death. Detecting and reporting them early is essential to prevent their occurrence or recurrence. Unfortunately, healthcare professionals have been consistently underreporting ADRs over time. Their understanding of pharmacovigilance systems, reporting procedures, and attitudes significantly impact this underreporting phenomenon. Thus, there is an urgent necessity to evaluate healthcare professionals' knowledge, attitudes, and practices to pinpoint the gaps and obstacles affecting their reporting behavior.

1.3. Objectives

1.3.1. General Objective

To assess healthcare professionals' knowledge, attitudes and practices on ADR-reporting.

1.3.2. Specific Objectives

1) To determine the level of knowledge among healthcare professionals regarding ADR reporting practices.
2) To investigate the relationship between healthcare professionals' attitudes towards ADR reporting and their actual reporting behavior.
3) To analyse the current ADR reporting practices of healthcare professionals and identify the factors that influence these practices.

1.4. Research Questions

1) What is the extent of healthcare professionals' knowledge regarding ADR reporting protocols and systems?
2) How do the attitudes of healthcare professionals towards ADR reporting relate with their actual reporting behavior?
3) What are the current practices of healthcare professionals in reporting ADRs, and what factors influence these practices

1.5. Rationale

The rationale of the study lies in the critical need to enhance the pharmacovigilance system by addressing the underreporting of Adverse Drug Reactions (ADRs) by healthcare professionals. ADRs pose substantial risks to patient safety, including hospitalization, disability, and even death. However, underreporting by healthcare professionals has been well-documented, suggesting a gap in the pharmacovigilance process. By assessing healthcare professionals' knowledge, attitudes, and practices regarding ADR reporting, the study aims to identify factors contributing to underreporting and develop strategies to improve reporting behavior. Ultimately, enhancing ADR reporting can lead to early detection, prevention, and mitigation of ADR-related risks, thereby safeguarding patient health and well-being.

1.6. Anticipated Benefits

The anticipated benefits of this study include:

Improved Patient Safety: By identifying and addressing factors contributing to underreporting of ADRs, HCPs can better detect and report ADRs promptly. This leads to enhanced patient safety by minimizing the risks associated with ADRs, such as hospitalization, disability, and death.

Strengthened Pharmacovigilance System: By understanding healthcare professionals' knowledge, attitudes, and practices regarding ADR reporting, the study can inform interventions aimed at improving the reporting process. This strengthens the pharmacovigilance system, ensuring that ADRs are systematically monitored, analyzed, and managed.

Enhanced Healthcare Quality: Improved ADR reporting practices contribute to a better understanding of medication safety and efficacy. This enables healthcare providers to make informed decisions about medication use, leading to improved healthcare quality and outcomes for patients.

Cost Savings: Early detection and prevention of ADRs can reduce healthcare costs associated with hospitalizations, additional treatments, and complications resulting from ADRs. By mitigating ADR-related risks, the study can help alleviate the financial burden on healthcare systems and patients.

Regulatory Compliance: By promoting adherence to ADR reporting requirements, the study supports regulatory compliance and fosters trust in healthcare systems and pharmaceutical products. This enhances transparency and accountability within the healthcare sector, benefiting both patients and stakeholders.

1.7. Scope of the Study

Geographic Scope: The study focuses specifically on HCPs within Bushenyi District, encompassing both government and private health facilities in the area.

Participant Inclusion Criteria: The study include HCPs from various disciplines working in the selected government and private health facilities, such as doctors, nurses, pharmacists and medical clinical officers. All these are involved in patient care and medication management.

Assessment Parameters: The study assessed HCPs' knowledge, attitudes, and practices related to Adverse Drug Reaction (ADR) reporting within the context of Bushenyi District. This includes understanding their familiarity with reporting protocols, their perceptions and beliefs about ADR reporting, and their actual reporting behaviors within the selected facilities.

Data Collection Methods: The study utilizes a quantitative approach, including surveys to gather information from healthcare professionals in Bushenyi District. Quantitative methods will be employed to measure knowledge levels and attitudes as well as explore underlying reasons and experiences related to ADR reporting practices specific to Bushenyi district.

Analysis Approach: Data analysis involves quantitative analysis of survey responses with a specific focus on understanding the unique challenges and opportunities for ADR reporting within Bushenyi District

2. Materials and Methods

2.1. Study Design

This study employed a quantitative method to gather a comprehensive understanding of healthcare professionals' knowledge levels, attitudes, practices and potential interventions for Adverse Drug Reaction (ADR) reporting. A cross-sectional survey was conducted to assess knowledge levels and attitudes quantitatively and to explore factors influencing practices and identify potential interventions.

2.2. Study Setting

The study was carried out in ten healthcare facilities including, Comboni Hospital Kyamuhunga, Ishaka Adventist Hospital, Bushenyi HC IV, Kyabugimbi HC IV, Kyeizooba HC III, Bushenyi Uganda Prisons HC III, Nyabubare HC III, Kakanju HC III, Kabushaho HC III, Ankole Tea Factory HC II. These HCFs are in Bushenyi District (00 32S, 3011E) in Western Uganda region. It is bordered by Rubirizi District to the NW, Baweja District to the NE, Sheema District to the East, Mitooma District to the South and Rukungiri District to the West. The 2020 statistics estimate the total population of Bushenyi district to be 248,300.

2.3. Study Population

The study includes HCPs from various disciplines working in the above selected health facilities, such as medical doctors, nurses, pharmacists and medical clinical officers (NDA 2019-2022). All these are involved in patient care and medication management.

2.4. Selection Criteria

The following criteria were used in selecting the study participants:

2.4.1. Inclusion Criteria

Healthcare professionals at the selected healthcare facilities, who directly interact with patients in relation to medicine use, in position to detect and report ADRs and were able to give their consent for participation were enrolled (Asiamah *et al.*, 2022). These include medical doctors, nurses, pharmacists and medical clinical officers.

2.4.2. Exclusion Criteria

Healthcare professionals who didn't consent did not participate in the study.

Sample size determination

$n = N / (1 + N*e^2)$

$n = 421 / (1 + 421*0.0025)$

$n = 205$ healthcare professionals

Where n is the sample size, N is the population size and e is the margin of error which is 0.05.

2.5. Sampling Technique

2.5.1. Purposive Sampling (SRS)

This technique was used to select health facilities and the number of study participants in each health facility to take part in the study. With this sampling technique, the researchers relied on their own judgment when choosing health facilities and the number of study participants in each health facility to participate in the study. This method was preferred because it is one of the most cost and time-effective sampling methods available and can be effective in exploring anthropological situations where the discovery of meaning can benefit from a natural approach. With this method, 10 Healthcare facilities were selected in Bushenyi District**.**

2.5.2. Simple Random Sampling (SRS)

A simple Random sampling method was used to select respondents until the sample size was achieved. With this method, every healthcare professional in the selected health facilities had an even chance and likelihood of being selected as a study participant. The method of the lottery was used in this study where each member who met the inclusion criteria had to number systematically and in a consequent manner which was assigned by the researcher written on a separate piece of paper. These pieces of paper were mixed and put into a box and then numbers are drawn out of the box in a random manner. The participants who selected odd numbers took part in this study.

2.6. Data Collection Methods

The questionnaires used were formulated using various studies that have been done about the same topic and then adjusted to suit the study area circumstances. Pré-tested questionnaires were used to interview participants about adverse drug reporting systems and protocols. The questionnaires were designed to capture all the information required in the study.

2.7. Data Analysis

Data was analysed using the SPSS computer software, version 25.0, and Excel software. Electronic backup copies of data on compact discs (CDS) were made. Results were presented in the form of tables, graphs and pie charts.

2.8. Ethical Considerations

The research proposal was submitted to the school of pharmacy and research ethics committee of Kampala International University for approval and permission to carry out the study sought from them. Permission to collect data and the different healthcare facilities was also sought from the administrators. Consent from the participants was sought and they had the right to accept or refuse to participate in the study. Confidentiality

was maintained throughout the data collection process, analysis, report writing and results dissemination process. Each questionnaire was assigned an identification code.

2.9. Dissemination of Findings

Three copies of the research proposal were made, one of which was submitted to the school of pharmacy research committee, the other to my supervisor and a personal copy.

3. Results

3.1. Introduction

This chapter is comprised of four sections. Section one presents findings on the sociodemographic profiles of health care professionals involved in this study. The socio-demographic profiles include gender, age, level of education, marital status, number of children, income, and occupation. Based on the purpose of this study, it is vital to understand the sociodemographic profiles of HCPs. Section two Section two of this chapter presents results for question one of this study: *What is the extent of healthcare professionals' knowledge regarding ADR reporting protocols and systems*? Section two Section three presents' findings for question two of this study: *How do the attitudes of healthcare professionals towards ADR reporting relate with their actual reporting behavior?* And then section three presents' findings for question three of this study*:* What are the current practices of healthcare professionals in reporting ADRs, and what factors influence these practices*?*

3.2. Socio-Demographics of HCPs

The socio-demographic characteristics of the participants are presented in Table 1. Out of a total of 172 participants, the gender distribution shows a significant disparity, with 120 males (69.77%) and 52 females (30.23%). This indicates a male-dominated workforce within the studied healthcare sector.

The age distribution of participants varied widely, with the majority being in the age group of 18-25 years which made up 56 participants (32.56%). This was followed by the 26-35 age group with 52 participants (30.23%), the 36-45 age group with 28 participants (16.28%), the 46-55 age group with 20 participants (11.63%),

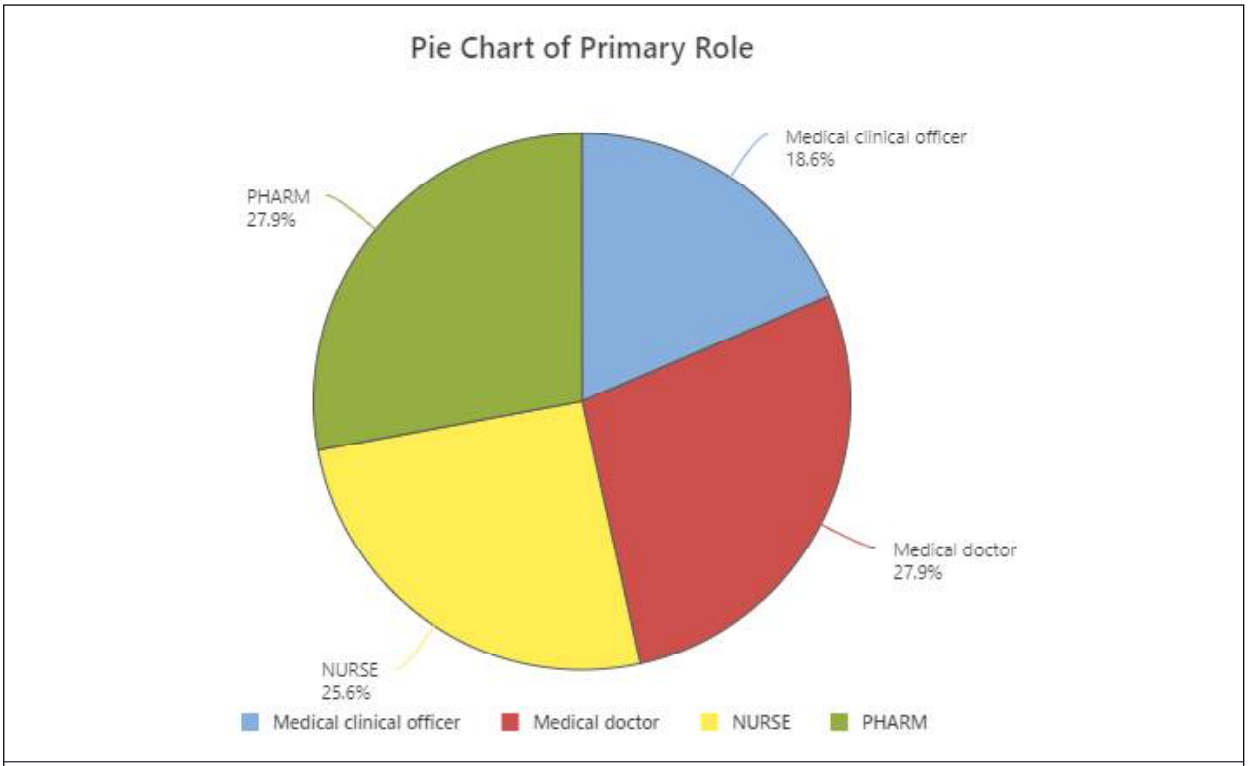

Figure 1: Primary Roles of Participants

Table 1: Socio-Demographic Characteristics of the Participants

Gender	Frequency(n)	Percent
Female	52	30.23
Male	120	69.77
Age Group		
>65	8	4.65
18-25	56	32.56
26-35	52	30.23
36-45	28	16.28
46-55	20	11.63
56-65	8	4.65
Level of Education		
Certificate	12	6.98
Degree	92	53.49
Diploma	32	18.60
Post-graduate	36	20.93
Primary Role		
Medical clinical officer	32	18.60
Medical doctor	48	27.91
NURSE	44	25.58
PHARM	48	27.91
Years of Experience		
>10 years	44	25.58
1-5 years	92	53.49
5-10 years	36	20.93
Type of Health Facility		
Government	84	48.84
Private for profit	44	25.58
Private not for profit	44	25.58
Level of Health Facility		
District hospital	80	46.51
Health Centre	60	34.88
Teaching hospital	32	18.60
Hospital		
Kyabugimbi HC IV	18	10.5
Kyeizoba HC III	10	5.8
Bushenyi Uganda Prisons HC III	11	6.4
Nyabubare HC III	13	7.6
Kakanju HC III	8	4.7
Kabushaho HC III	12	7
Ankole Tea Factory HC II	6	3.5

and both the 56-65 and >65 age groups with 8 participants each (4.65%). Majority of the participants held degrees specifically, 92 participants (53.49%) had a degree, 36(20.93%) had post-graduate qualifications,

32(18.60%) had diplomas, and 12(6.98%) held certificates. This reflects a well-qualified healthcare workforce. The primary roles of participants were fairly evenly distributed among medical professionals. Medical doctors and pharmacists each accounted for 48 participants (27.91%), nurses comprised 44 participants (25.58%), and medical clinical officers made up 32 participants (18.60%).

Regarding years of experience, over half of the participants had between 1-5 years of experience (53.49%), 20.93% had 5-10 years of experience, and 25.58% had more than 10 years of experience. This suggests a mix of both early-career and seasoned professionals. The type of health facility where participants worked showed a predominance of government institutions. Government health facilities employed 48.84% of participants, while private for-profit and private not-for-profit facilities each employed 25.58%. Participants were employed across various levels of health facilities. The majority, 46.51%, worked in district hospitals, 34.88% in health centres, and 18.60% in teaching hospitals. The distribution of hours worked per shift showed a mean of 8.54 hours (SD = 1.64), ranging from 4 to 12 hours. The most common shift length across all roles was 8 hours. The mean number of days worked per week was 5.07 (SD = 0.82), with a range from 3 to 7 days. The average number of patients seen per day was 27.22 (SD = 16.50), with a range from 6 to 90 patients.

3.3. Knowledge of HCPs on ADR Reporting in Bushenyi District

3.3.1 General Knowledge of HCPs on ADR Reporting

This study found that there is generally a high moderate knowledge of ADR reporting practices of (113)65.7% of the HCPs. 44(25.58%) had good knowledge and 15(8.72%) had poor knowledge.

Table 2: General Knowledge of Participants

General Knowledge		
Knowledge Grade	**Frequency**	**Percentage (%)**
Good Knowledge	44	25.58
Moderate Knowledge	113	65.7
Poor Knowledge	15	8.72

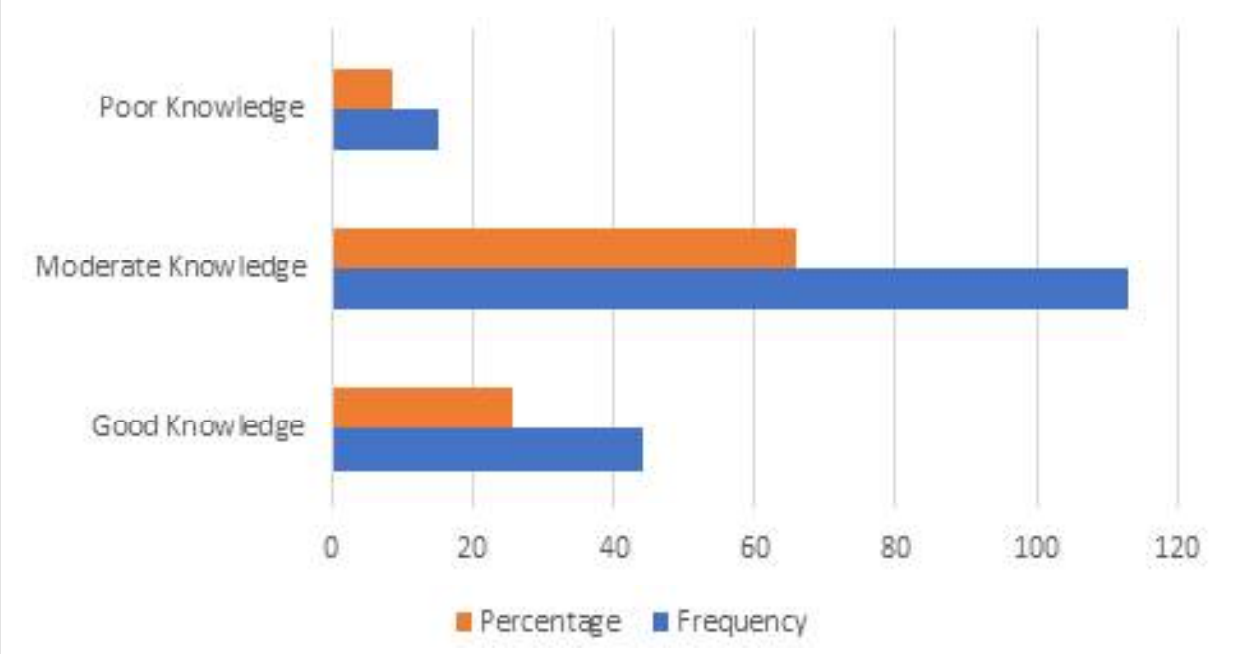

Figure 2: Knowledge of ADR Reporting Practices

3.3.2. Detailed Knowledge

Table 3 presents the general knowledge among participants regarding ADR reporting practices. Many study participants 144(83.72%) correctly defined an ADR as a correctly as any unintended, noxious response to drugs in normal doses used in human beings. Many (156)90.70% knew how to report ADRs. 112(68.29%) preferred reporting using an ADR-reporting form with 96(55.81%) having access to ADR-reporting forms. Only 84(48.84%) participants reported receiving feedback on their ADR reports. 104(60.47%) had received formal training on ADR reporting with the majority 84(48.84%) having received formal training over 3 years ago. 80(46.51%) reported having encountered ADRs rarely in their practice. The most common sources of knowledge on ADR-reporting were NDA sensitization 64(37.21%) and continuous professional development sessions 36(20.93%). All 172(100%) study participants reported that all HCPs should report ADRs.

Table 3: General Knowledge ADR Reporting

Variable	Frequency (n)	Percent
ADR Definition		
All the above	4	2.33
Any unintended, noxious response	144	83.72
The same as a side effect	20	11.63
Therapeutic effect of a drug	4	2.33
Know How to Report ADRs		
No	16	9.30
Yes	156	90.70
Reporting Method		
ADR-reporting form	112	68.29
E-mail	48	29.27
Other	12	6.98
ADR-Reporting Forms		
No	76	44.19
Yes	96	55.81
Reporting Email		
Official E-mail	111	66.47
Personal E-mail	56	33.53
Received Feedback		
No	88	51.16
Yes	84	48.84
Formal Training		
No	60	34.88
Not sure	8	4.65
Yes	104	60.47
Last Training		
In the past year	64	37.21
Over 3 years ago	84	48.84
Three years ago	8	4.65
Two years ago	16	9.30

Table 3 (Cont.)		
Encounter ADRs		
Frequently	32	18.60
Occasionally	60	34.88
Rarely	80	46.51
Source of Knowledge		
At annual general meetings of the respective professions	4	2.33
Continuous Professional Development (CPD) sessions	36	20.93
CPD sessions	32	18.60
NDA sensitization	64	37.21
School curriculum	28	16.28
Social media	8	4.65
Encounter Frequency		
Frequently	44	25.58
Occasionally	84	48.84
Rarely	36	20.93
Very frequently	8	4.65
Should Report ADRs		
All Health Care Professionals	172	100.00

3.3.3. Attitudes Towards ADR Reporting

Table 5 presents participants' attitudes towards ADR reporting. 99% considered ADR reporting extremely or

Table 4: General Attitude Towards ADR Reporting		
General Attitude		
Attitude	**Frequency**	**Percentages**
Positive	140	81.4
Negative	32	18.6

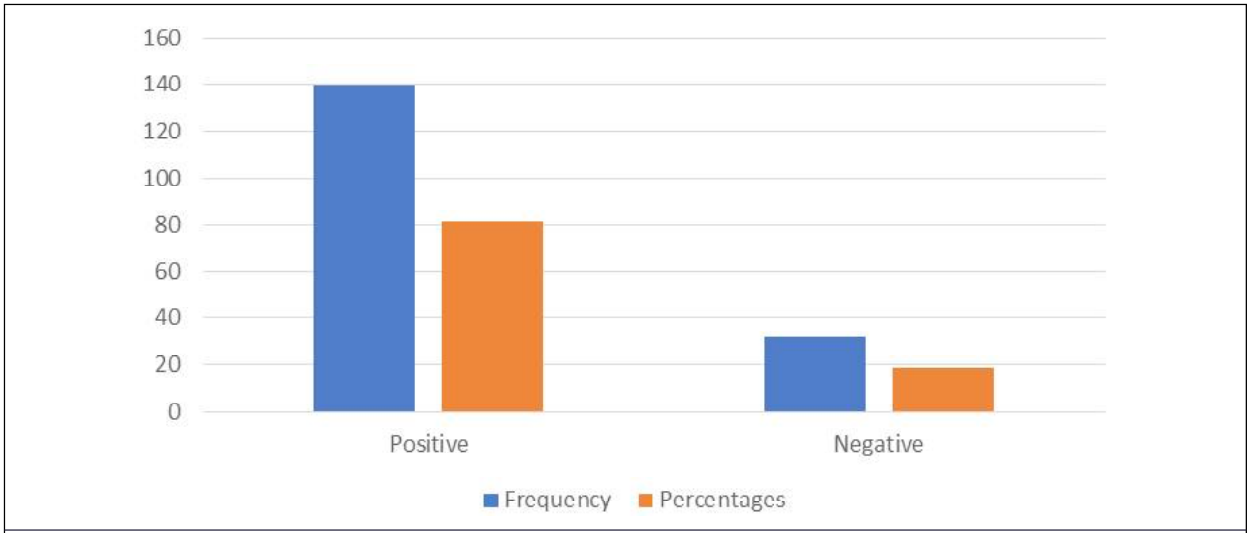

Figure 3: General Attitude of Health Workers

very important. 132(76.74%) agreed that ADR reporting contributes to safety. 124(72.09%) supported the provision of incentives for reporting. 164(95.35%) expressed concerns about fear of blame when they report ADRs. 156(90.70%) believed in the necessity to report ADRs. 164(95.35%) would report ADRs even if it makes them appear ridiculous. 156(90.70%) believed a single report contributes to pharmacovigilance or medical knowledge. 164(95.35%) agreed that serious and unexpected reactions are not the only ADRs to be reported. 160(93.02%) would report ADRs regardless of workload. 156(90.70%) would follow through with the reporting process no matter how long it takes. 160(93.02%) would report even without feedback.

Table 5: Attitudes Towards ADR Reporting

Variable	Frequency(n)	Percent
Importance of Reporting		
Extremely important	64	37.21
Very important	108	62.79
Contributes to Safety		
Agree	132	76.74
Disagree	16	9.30
Nuetral	24	13.95
Incentives for Reporting		
No	36	20.93
No response	12	6.98
Yes	124	72.09
Fear of Blame		
No response	8	4.65
Yes	164	95.35
Need for Reporting		
No	8	4.65
No response	8	4.65
Yes	156	90.70
Report if Not Certain		
No	8	4.65
Yes	164	95.35
Single Report Contribution		
No	16	9.30
Yes	156	90.70
Report Unexpected Reactions		
No	4	2.33
No response	4	2.33
Yes	164	95.35
Report Regardless of Workload		
No	4	2.33
No response	8	4.65
Yes	160	93.02

Table 5 (Cont.)		
Report if Schedule Tight		
No response	16	9.30
Yes	156	90.70
Follow Through Process		
No	4	2.33
No response	12	6.98
Yes	156	90.70
Report Without Feedback		
No	12	6.98
Yes	160	93.02

3.3.4. Practices and Influencing Factors

73.8% demonstrated good ADR reporting practices.

Table 6: Current Practice

Practice	Frequency	Percentage
Good Practice	127	73.8
Poor practice	45	26.2

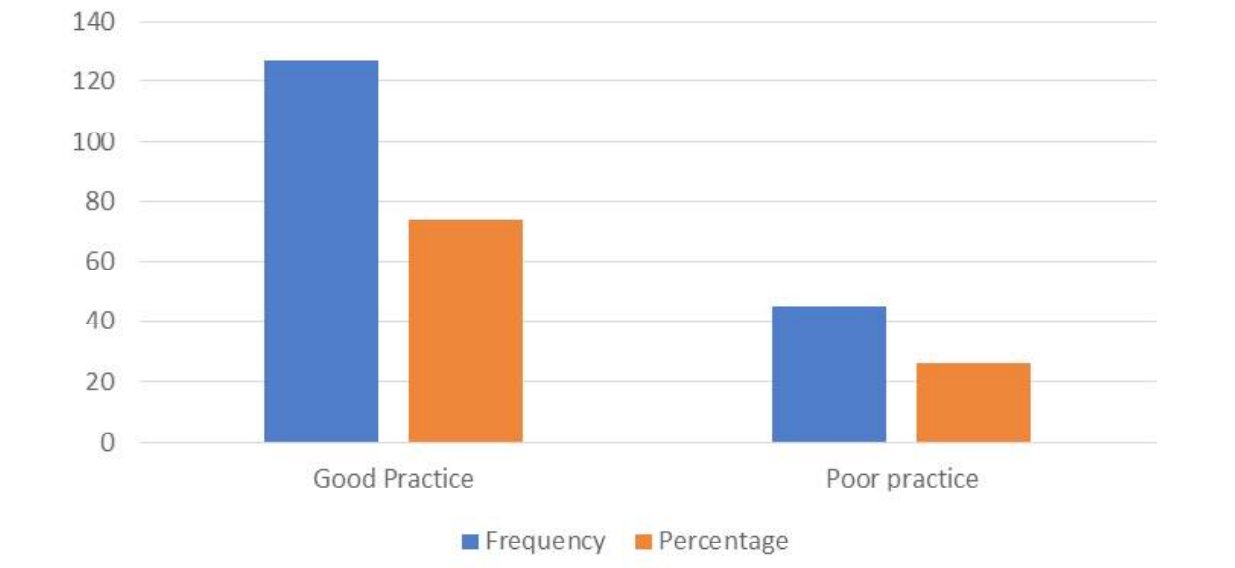

Figure 4: Current Practices and Influencing Factors on ADR Reporting

Table 4 outlines current practices and influencing factors in ADR reporting. 12(6.98%) always reported ADRs, 32(18.60%) reported frequently, 4(2.33%) never reported, 60(34.88%) reported occasionally, and 64(37.21%) rarely reported. The availability of time and resources was the most cited factor influencing ADR reporting 92(53.49%). 128(74.42%) had ever reported an ADR. 131(76.16%) participants reported that their colleagues reported ADRs. The most preferred method was the ADR-reporting form 75(43.86%). Challenges reported included time constraints, lack of feedback, and complexity of the reporting process.

3.4. Gender Distribution

Our study reveals a significant gender disparity among healthcare professionals, with 69.77% being male

and 30.23% female. This male predominance is consistent with findings from studies conducted in similar contexts. For instance, a study by Alsaleh *et al.* (2017) in Saudi Arabia also reported a higher percentage of male healthcare workers involved in ADR reporting (Alsaleh *et al.*, 2017). This trend could be attributed to cultural and societal norms that influence the gender composition of the workforce in these regions.

However, contrasting findings are observed in studies from Western countries where the healthcare workforce tends to have a more balanced gender distribution. For example, a study in the United States reported a nearly equal distribution of male and female healthcare professionals (Harris *et al.*, 2018). These differences highlight the need for context-specific strategies to address gender disparities in healthcare settings.

3.5. Age Distribution

The age distribution in our study shows a predominantly young workforce, with the majority (63%) being between 18-35 years. This aligns with findings from similar studies in other developing countries where younger healthcare professionals are more prevalent. A study in Nigeria reported a similar age distribution with a significant proportion of healthcare workers being under the age of 35 (Oshikoya *et al.*, 2013). This youthful demographic could be a reflection of recent educational advancements and the influx of new graduates into the healthcare system.

In contrast, studies from developed countries often report a more balanced age distribution. For example, a study in the United Kingdom found a more even spread across different age groups (Williams and Feely, 2010). The younger demographic in our study area may have implications for ADR reporting, as younger professionals might be less experienced but potentially more open to adopting new practices and technologies.

3.6. Level of Education

Our study indicates a high level of education among healthcare professionals, with 53.49% holding degrees and 20.93% having post-graduate qualifications. This is consistent with findings from similar studies in developing countries, such as a study in India where a significant proportion of healthcare professionals held advanced degrees (Desai *et al.*, 2011). The high educational attainment could contribute to better knowledge and practices in ADR reporting.

However, the emphasis on formal education might not always translate to practical knowledge and reporting efficiency. For instance, studies in some Western countries, despite high educational levels, highlight ongoing challenges in ADR reporting practices due to factors like workload and system complexity (Lopez-Gonzalez *et al.*, 2009). This suggests that while education is crucial, it must be complemented by practical training and streamlined reporting systems.

The primary role of healthcare professionals significantly influences ADR reporting practices. Our study included medical doctors and pharmacists (each 27.91%), nurses (25.58%), and medical clinical officers (18.60%). Literature indicates that pharmacists and doctors are often more involved in ADR reporting due to their direct role in medication management and patient care (Heredea *et al.*, 2017). Nurses, while crucial in monitoring patient outcomes, may report less frequently due to workload and hierarchical reporting structures within healthcare settings (Ojo *et al.*, 2020).

Experience is a critical factor in ADR reporting. Our findings showed that 53.49% of participants had 1-5 years of experience, while 25.58% had more than 10 years of experience. Experienced healthcare professionals might be more adept at identifying ADRs due to their extensive clinical exposure. However, younger professionals might be more enthusiastic about adhering to new reporting systems and protocols. A balanced mix of experience levels, as observed in our study, can provide a comprehensive approach to ADR reporting, combining seasoned judgment with contemporary practices (Williams and Feely, 2020).

3.7. Working Hours

The study revealed significant variations in working hours, days per week, and patient loads across different primary roles in the healthcare setting.

The predominant shift length was 8 hours, but medical doctors and pharmacists also had a considerable proportion working longer shifts (10 and 12 hours). This reflects the demanding nature of their roles and possibly the staffing patterns or operational hours of the facilities they work in.

Days per Week: The majority of the healthcare workers worked 5 days a week, which aligns with standard full-time work schedules. However, a noteworthy proportion of pharmacists worked only 3 days a week, which could suggest part-time roles or job-sharing arrangements.

Patient Load: With an average of 27 patients per day, there is a significant variation in patient loads, which may be influenced by the type of healthcare facility, the specific duties of the roles, and the level of staffing.

These findings are consistent with other research indicating that healthcare professionals often work long hours and manage substantial patient loads, which can impact their well-being and the quality of care provided. The variation in work patterns across different roles underscores the need for tailored interventions to address workload and optimize staffing in healthcare settings.

4. Knowledge of ADR Reporting

In our study, 65.7% of participants demonstrated moderate knowledge of ADR reporting, while 25.58% had good knowledge. This is comparable to findings from studies in other developing countries, such as a study in Ethiopia and Nigeria where moderate knowledge levels were also predominant among healthcare workers.

Similarly, Piening *et al.* (2012) reported that healthcare professionals in the Netherlands had a moderate level of knowledge about ADR reporting, although their study highlighted certain areas of knowledge gaps. The recognition of ADRs as unintended noxious responses by 83.72% of participants indicates a substantial understanding of the basic concepts of ADRs.

The proportion of participants with good knowledge (25.58%) in this study is notably higher than the 15% reported by Williams and Feely (2010) in Ireland. This discrepancy may be attributed to differences in training programs, the emphasis placed on pharmacovigilance by different institutions, or the methodologies used to assess knowledge. The relatively small proportion of participants with poor knowledge (8.72%) aligns with findings by Elkalmi *et al.* (2011), who noted that despite general awareness, specific knowledge about ADR definitions and reporting procedures was often lacking among healthcare professionals.

Despite this, the gap between knowledge and practice is evident. Studies in developed countries often report higher knowledge levels but similar challenges in translating this knowledge into practice (Hazell and Shakir, 2006). This underscores the need for continuous education and practical training programs to bridge this gap.

5. Attitudes Towards ADR Reporting

A positive attitude towards ADR reporting was observed in 81.4% of participants in our study. This is in line with findings from other studies in developing countries, such as in Malaysia where positive attitudes were reported among healthcare professionals (Aziz *et al.*, 2007).

For instance, Durrieu *et al.* (2011) also reported a generally positive attitude among French healthcare professionals, where a majority recognized the importance of ADR reporting for patient safety.

The high value placed on the importance of ADR reporting (99%) and its contribution to safety (76.74%) reflects a strong theoretical commitment to pharmacovigilance.

The overwhelming acknowledgment of the importance of ADR reporting, with 99% of participants considering it extremely or very important, aligns with Piening *et al.* (2012), where healthcare professionals agreed that ADR reporting was crucial for improving drug safety. However, the fear of blame associated with reporting, noted by 95.35% of participants, mirrors findings by Durrieu *et al.* (2011) and Patton *et al.* (2008), who also identified fear of blame as a significant deterrent to ADR reporting. These findings suggest that while attitudes are generally positive, systemic and organizational barriers need to be addressed to translate these attitudes into consistent practices.

6. Practices and Influencing Factors

Our study found that 73.8% of participants demonstrated good ADR reporting practices, yet the frequency of

actual reporting varied, with occasional reporting being the most common (34.88%). This is higher compared to the findings of Elkalmi (2011) in Malaysia, where only 50% of the respondents exhibited good reporting practices. The difference could be attributed to the different levels of emphasis on ADR reporting training and institutional policies encouraging reporting.

All surveyed professionals unanimously agreed that ADRs should be reported. This consensus is consistent with the literature, which underscores the universal acknowledgment of the importance of ADR reporting in enhancing patient safety and improving drug monitoring systems (Hughes *et al.*, 2002; Lopez-Gonzalez *et al.*, 2009).

These findings are also consistent with global trends where underreporting of ADRs is a persistent issue. A study in Europe reported that despite good knowledge and attitudes, actual ADR reporting rates were low, often due to time constraints and the complexity of reporting systems (Piening *et al.*, 2012).

The most cited influencing factor in our study was the availability of time and resources (53.49%), which is a common theme in other studies as well. For instance, in a study conducted in South Africa, healthcare professionals cited similar barriers, including lack of time and administrative burdens (Mehta *et al.*, 2011). These findings highlight the need for simplifying the ADR reporting process and providing adequate resources and support to healthcare professionals.

7. Implications for Practice and Policy

The findings from this study have several implications for practice and policy in the healthcare sector. Firstly, there is a need to address the gender disparity in the workforce by implementing targeted recruitment and retention strategies for female healthcare professionals. This could help in creating a more balanced and inclusive work environment.

Secondly, the predominance of younger healthcare professionals highlights the importance of continuous professional development and mentoring programs to enhance their practical skills and experience in ADR reporting. Given their openness to new practices, younger professionals could be pivotal in adopting and advocating for better ADR reporting systems.

Thirdly, the high level of formal education among healthcare professionals should be leveraged to enhance practical training programs focused on ADR reporting. Continuous education initiatives, such as workshops and seminars, should be regularly conducted to update healthcare professionals on the latest guidelines and practices in pharmacovigilance.

Moreover, addressing systemic barriers such as fear of blame and lack of incentives is crucial. Creating a supportive environment that encourages ADR reporting without fear of reprisal and providing incentives for consistent reporting can significantly improve reporting rates. Additionally, simplifying the ADR reporting process and integrating it into routine clinical workflows can alleviate time constraints and administrative burdens.

Lastly, the findings underscore the importance of feedback mechanisms. Nearly half of the participants in our study reported not receiving feedback on their ADR reports. Establishing robust feedback systems where healthcare professionals receive timely and constructive feedback can enhance their engagement and commitment to ADR reporting.

8. Recommendations

To improve ADR reporting rates and overcome identified barriers, several targeted interventions are recommended:

Enhancing Training Programs: Implementing comprehensive training programs on pharmacovigilance and ADR reporting for all healthcare professionals can boost confidence and competence in reporting.

Streamlining Reporting Processes: Simplifying and standardizing the reporting process, particularly through digital means, can address time and resource constraints.

Providing Feedback Mechanisms: Establishing robust feedback mechanisms to inform reporters about the impact of their reports can reinforce the importance of their contributions and encourage continued reporting.

Addressing Fear of Blame: Developing clear guidelines and legal protections can mitigate fears of blame and legal repercussions, fostering a more open reporting culture.

The study highlights the need for a multifaceted approach to enhance ADR reporting practices among healthcare professionals. By addressing the identified barriers and leveraging the preferred reporting methods, healthcare systems can foster a more robust pharmacovigilance culture. This, in turn, will contribute significantly to patient safety and the effectiveness of drug monitoring systems. Future research should focus on evaluating the impact of implemented interventions and exploring additional strategies to sustain high reporting rates across all professional roles.

9. Limitations and Future Research

While this study provides valuable insights, it is not without limitations. The cross-sectional design limits the ability to establish causality between variables. Additionally, the self-reported nature of the data may introduce response biases. Future research should consider longitudinal studies to track changes in knowledge, attitudes, and practices over time. Moreover, qualitative studies exploring the underlying reasons for underreporting and identifying effective strategies to overcome these barriers can provide deeper insights.

10. Conclusion

In conclusion, the study highlights both the strengths and challenges in ADR reporting practices among healthcare professionals. While there is a generally positive attitude and moderate to good knowledge levels, practical barriers persist that hinder consistent reporting. Addressing these barriers through targeted interventions, continuous education, and supportive policies can enhance ADR reporting practices, ultimately contributing to improved patient safety and healthcare outcomes.

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