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Underreporting of Adverse Drug Reaction: A Critical Issue in Healthcare

Satish Kumar B P[1]; Dr. Nandini H B.[2]
Associate Professor[1], Pharm.D Intern[2]
Department of Pharmacy Practice
Sri Adichunchanagiri College of Pharmacy,
Mandya, India

Dr. Medhini H Gowda[3]*
Pharm.D Intern, Department of
Pharmacy Practice Sri Adichunchanagiri
College of Pharmacy,
Mandya, India

Abstract:- Pharmacovigilance (PV), initiated by the World Health Organisation (WHO) in 1968, encompasses the systematic exploration and management of adverse effects associated with medications. The Programme for International Drug Monitoring (PIDM) and WHO Collaborating Centre for International Drug Monitoring (UMC) engage 134 nations, aiming to standardize PV practices amid global pharmaceutical expansion. Adverse drug reactions (ADRs) incur significant morbidity and financial burdens, especially in countries like India with diverse drug usage patterns. Adverse drug events (ADEs), including medication errors and ADRs, challenge global public health, causing harm and escalating healthcare costs. Underreporting persists despite ADR Monitoring Centres (AMCs), necessitating enhanced training, public education, and integrated drug safety education.

This article delves into the pervasive issue of underreporting ADEs, exploring its extent and underlying factors. Analyzing the current state is crucial for developing potential solutions to bolster ADE reporting and advance patient safety. ADR identification methods are categorized into combined, active, and passive strategies. Combined methods integrate various approaches comprehensively. Active methods, using computerized reporting and medical note reviews, exhibit reasonable detection rates. Passive methods, specifically spontaneous reporting, reveal lower rates due to workflow interruptions and lack of knowledge. Underreporting factors span fear-based, knowledge-based, system-based, and organizational-based elements. Fear of adverse consequences fosters a culture of silence, hindering comprehensive reporting.

Rational solutions involve establishing a global consensus, educational interventions, improving electronic reporting systems, and exploring alternative data sources. Continuous efforts are imperative to enhance knowledge, attitudes, and reporting practices, ultimately improving medication safety and patient care outcomes.

Keywords:- *Underreporting, Healthcare Professional, Solutions, Adverse Drug Reaction.*

I. INTRODUCTION

Pharmacovigilance (PV) encompasses the scientific study and practise of identifying, evaluating, comprehending, and averting adverse effects or issues associated with medications. In 1968, the World Health Organisation (WHO) launched the Programme for International Drug Monitoring (PIDM), and in 1978, it formed the WHO Collaborating Centre for International Drug Monitoring (UMC). The WHO PV Programme now includes 134 nations. In an attempt to enhance understanding of the benefit-risk profile of medications and risk communication, the pharmaceutical industry's globalisation has prompted attempts to standardise PV practises globally(1).

Adverse drug reactions (ADRs) are unpleasant side effects that occur as a result of pharmacological therapy at human levels. They are a primary source of morbidity and death as well as a factor in the skyrocketing expenditures of medical care. The characteristics of drug usage in countries like India, such as huge patient numbers, poor doctor-patient ratios, self-medication practises, alternative medical systems, malnourishment, counterfeit pharmaceuticals, and the largest number of combination products, mean that many observed adverse drug reactions (ADRs) go unreported(2).

Adverse drug events (ADEs) pose a significant challenge to public health worldwide. These events, which encompass medication errors (MEs) and adverse drug reactions (ADRs), can lead to harm for patients and result in increased healthcare costs. While MEs are preventable errors in the medication delivery process, ADRs can occur even with appropriate medication usage. Both MEs and ADRs are often underreported, resulting in a limited understanding of their prevalence and impact(3).

Despite the establishment of ADR Monitoring Centres (AMCs), a total of yearly reports provided is lower than expected. This necessitates increasing the monitoring of adverse responses by means of systemic and sporadic training of health professionals, educating the public against self-medication, and including drug safety into the curricula of medical and pharmaceutical undergraduate programmes(4).

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Underreporting of adverse drug events (ADEs) is the term used to describe the failure or inadequate reporting of events by patients, pharmaceutical corporations, or healthcare practitioners when patients have negative drug responses. ADRs and MEs are two examples. Various countries, including the United States, the United Kingdom, Canada, and Australia, have established reporting systems for medication errors and ADRs, such as FAERS in the United States, the Yellow Card Scheme in the United Kingdom, and the Canada Vigilance Programme, as examples of systems that collect reports of adverse drug events from patients and healthcare providers(3,4). Despite this, underreporting is a pervasive and ongoing issue(5).

This article aims to explore the extent of underreporting of ADEs and identify the underlying factors contributing to this issue. By analyzing the current state of underreporting, we can develop potential solutions to improve ADE reporting and enhance patient safety.

II. METHODS FOR ADVERSE DRUG REACTIONS IDENTIFICATION

The methods of identifying ADRs were divided into combined, active and passive strategies.

A. Combined methods

Among the various methods employed, we can highlight the amalgamation of a computerized system for adverse drug reaction (ADR) reporting, utilization of laboratory data, incorporation of electronic healthcare records through triggers, examination of medical notes, consideration of International Classification of Diseases 9th Edition codes linked to ADRs, implementation of educational interventions, participation in ward rounds, gathering feedback from patients/parents or clinicians, and encouraging spontaneous ADR reporting. The rationale for employing multiple approaches is commonly justified because the integration of these methods consolidates patient information, facilitating the identification of ADRs. However, beyond the advocated strategies, additional factors may influence this outcome, such as the specific characteristics of the hospital wards. For instance, patients admitted to intensive care units or oncology wards are more prone to experience ADRs. Additionally, variables like the profile of medication usage, structural conditions (both physical and human resources), and the choice of causality assessment tool can result in varying rates of ADR identification.[6].

B. Active methods

Within the active approaches, six studies encompassed computerized systems for reporting adverse drug reactions (ADRs), electronic healthcare records utilizing triggers, and medical note reviews employing triggers. Overall, these active methods demonstrated a satisfactory level of ADR detection. Among the actively employed search techniques, the review of medical and nursing notes is a common practice and is effective in identifying various types of ADRs. One notable advantage of this method is the direct monitoring of patients by a trained observer, enabling the recognition and documentation of clinical events during follow-up[6].

C. Passive methods

Among the various methods, spontaneous reporting exhibited the lowest ADR identification rate compared to other approaches. This discovery aligns with literature findings, which highlight several reasons why this particular method is not highly effective. These reasons include professionals' perception that interrupting their workflow to complete a form does not contribute to the identification or prevention of ADRs, as well as a potential lack of knowledge to recognize such events [6].

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Table 1: Methods for Identifying Adverse Drug Reactions (ADRs) and Descriptions of Each Method

Methods for identifying ADR	Description of method
Combined: active and passive (1) Educational intervention; (2) Spontaneous ADR reporting; (3) Computerized ADR reporting system; (4) Medical notes review; (5) Interviewing parents or clinicians;	Identification of ADR occurred by several methods: (1) The ward staff were concised on the definition, presentation and classification of ADRs during educational program held. (2) ADR reporting form was kept at the ward counter for Health professionals. 3) Computerized information system where progress notes are created whenever a patient come into contact with the medical staff. The progress notes are recorded for all eligible patients were screened daily team to identify all implicit ADRs. (4) We cross-referenced offering symptoms/signs against the medication history for each patient using the ADR profile for relevant drugs. We identified possible ADRs using this information combined with the clinical history and temporal relationships of the medication(s) taken. (5) Patients were assessed for ADR, through detailed interview of parents on the basis of questionnaire. Final decision regarding continuation of the drug was left to the treating pediatrician.

III. FACTORS CONTRIBUTING TO UNDERREPORTING OF ADVERSE DRUG EVENTS

The underreporting of Adverse Drug Events (ADEs) is influenced by various factors, encompassing fear-based, knowledge-based, system-based, and organizational-based elements. Fear-based factors arise from concerns about possible adverse consequences, such as retribution, litigation expenses, damage to reputation, or impacts on one's career. This apprehension tends to foster a culture of silence within healthcare providers, fostering an environment where the reporting of adverse drug events is stifled. This, in turn, has adverse implications for patients, as it contributes to a lack of comprehensive reporting and understanding of potential risks associated with drug-related incidents (7).

Factors based on knowledge pose obstacles to reporting, manifesting through a deficiency in awareness or understanding of Adverse Drug Event (ADE) reporting procedures. Insufficient knowledge extends to a lack of familiarity with clinical outcomes associated with ADEs and misconceptions regarding the necessary reporting criteria. The hindrance in reporting effectiveness is exacerbated by inadequate training or education on adverse event reporting. This lack of knowledge-based preparedness contributes to a suboptimal reporting environment, impeding the comprehensive and accurate documentation of adverse drug events in healthcare settings [8].

System-based factors involve the mechanisms and processes established for the reporting of Adverse Drug Events (ADEs). The effectiveness of reporting can be compromised by inadequate reporting systems or tools, complications in utilizing electronic systems, and the absence of standardized criteria or definitions for identifying and documenting ADEs. These challenges can act as deterrents, discouraging healthcare professionals from actively engaging in the reporting of adverse drug events. Additionally, the lack of proper feedback or follow-up mechanisms further impedes reporting efforts, as healthcare providers may feel that their contributions are not valued or that the reporting process lacks meaningful impact. In essence, shortcomings in the systems and tools designed for ADE reporting can significantly undermine the overall efficacy of the reporting process within healthcare settings [3].

Organizational-based factors encompass a spectrum of challenges that influence the reporting of Adverse Drug Events (ADEs). One significant aspect is the absence of leadership support within healthcare organizations, which can manifest as a lack of emphasis on the importance of ADE reporting. Insufficient allocation of resources, both in terms of time and personnel, further contributes to a suboptimal reporting environment. Complicating matters, organizational priorities may be skewed towards other metrics, overshadowing the significance of ADE reporting. This shift in focus can lead healthcare professionals to deprioritize or neglect reporting adverse drug events, diminishing the overall accuracy and comprehensiveness of the reporting process. Poor collaboration and communication within healthcare teams exacerbate these challenges. The lack of a cohesive and transparent reporting culture impedes the sharing of information about adverse drug events among team members. In essence, addressing organizational-based factors is crucial for fostering a reporting environment that encourages openness, collaboration, and a commitment to patient safety [9].

Patients and consumers also face barriers to reporting ADEs, including a lack of motivation, fear of labelling themselves as difficult patients, and negative consequences. Additionally, limited access to reporting mechanisms, inadequate feedback/follow-up, language barriers, and lack of internet access can contribute to underreporting by patients and consumers. It is important to note that certain adverse drug reactions, such as sexual disorders, can be difficult for patients or healthcare providers to report due to discomfort or stigmatization. Addressing these concerns and raising awareness of their significance can improve medication safety and patient outcomes [10].

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IV. ADR REPORTING SCENARIO in DIFFERENT COUNTRIES

As per the definition provided by the World Health Organization (WHO), pharmacovigilance encompasses the field and activities dedicated to the detection, evaluation, comprehension, and prevention of adverse effects or any other drug-related issues. The scope of pharmacovigilance extends to include herbals, traditional medicines, blood products, biologicals, vaccines, and medical devices as well [11]. The primary challenge within pharmacovigilance is the underreporting of adverse drug reactions (ADRs). Healthcare providers serve as the primary source for submitting suspected ADR reports to the relevant medicine regulatory agencies [12]. There is a pressing need for the standardization of ADR reporting forms across countries due to significant variations in the data captured by existing forms, which are designed differently for each country. Incomplete data obtained from these diverse forms can lead to improper causality assessments of ADRs and may impede the identification of potential signals. For instance, an ADR classified as a 'certain' occurrence could be inaccurately interpreted as 'unlikely' or 'not assessable' due to insufficient data [13].Global statistics indicate that ADR reporting rates are highest in high-income countries and lowest in low-income countries [11].

A. ADR Reporting in India

Following the thalidomide incident in the early 1960s, the World Health Organization (WHO) initiated the International Drug Monitoring program. WHO, through its Collaborating Centre in Uppsala, actively promotes pharmacovigilance with the aim of enhancing patient safety and providing relevant and reliable information for the ongoing risk-benefit assessment of marketed drugs [11]. Despite these efforts, the initiative faced challenges, prompting the Government of India to launch the National Pharmacovigilance Program for India (NPPI) in November 2004, with support from WHO and the World Bank. The NPPI is supervised by the National Pharmacovigilance Advisory Committee (NPAC), based in the Central Drugs Standard Control Organization (CDSCO) in New Delhi. Two zonal centers—the South-West Zonal (SW) center and the North-East (NE) Zonal center—were tasked with collecting information nationwide and forwarding it to the Committee and the Uppsala Monitoring Centre (UMC). Beneath these zonal centers, there were five regional centers, and under each regional center, 26 peripheral centers were established [4]. Inadequate reporting of adverse drug reactions (ADRs) ultimately results in the oversight or delayed identification of numerous critical signals, allowing potentially unsafe medicines to persist in the market and pose a threat to patient safety [11].

B. ADR Reporting in USA

The United States Food and Drug Administration (FDA) bears the crucial responsibility of ensuring drug safety in the country. However, the FDA relies on the spontaneous reporting of Adverse Drug Reactions (ADRs). Research studies have uncovered a pervasive issue of under-reporting of ADRs. To address this, the FDA established the Adverse Drug Event Reporting System (FAERS) to furnish information regarding human ADRs reported to the FDA in accordance with the guidelines set by the International Conference on Harmonisation (ICH). Similar to many other standard Individual Case Safety Report (ICSR) databases, FAERS has its main drawbacks, including the presence of duplicate, deficient, and unverified reports [4].

C. ADR Reporting in Saudi Arabia

The significance of pharmacovigilance in ensuring patient safety and enhancing the quality of healthcare in Saudi Arabia is increasingly acknowledged. There is an urgent need for healthcare professionals to improve their proficiency in pharmacovigilance practices. Given the relatively low rate of Adverse Drug Reaction (ADR) reporting among pharmacists, it would be beneficial to identify factors that are likely to contribute to more effective reporting of ADRs. A comprehensive approach involving multiple stakeholders and strategies for ADR reporting is necessary to raise significant awareness of this issue among pharmacists [14].

D. ADR Reporting in Bangladesh

In Bangladesh, the Director General of Drug Administration (DGDA) takes an active role in safeguarding patient safety. In 1996, with the guidance of the World Health Organization (WHO), a cell was established within the DGDA. Subsequently, in 1997, the Ministry of Health and Family Welfare established the Adverse Drug Reaction Advisory Committee (ADRAC) to assess, analyze, and provide recommendations for addressing issues related to medicinal hazards arising from Adverse Drug Reactions (ADRs) [4].

E. ADR Reporting in Malaysia

A Any reports of Adverse Drug Reactions (ADRs) linked to the usage of registered products in Malaysia must be promptly submitted to the Drug Control Authority (DCA) within the specified timeframe. Registration holders who have registered a product containing a New Chemical Entity (NCE) post January 1, 2002, are required to regularly submit Periodic Safety Update Reports (PSUR) for the first two years following approval in Malaysia and subsequently on an annual basis for the next three years [4].

F. ADR Reporting in Nepal

About 75% of medications in Nepal are imported from abroad due to the country's limited capacity in drug manufacturing. Before a drug is introduced to the market, the regulatory authority, the Department of Drug Administration (DDA), thoroughly evaluates it based on data obtained from other countries. In Nepal, pharmacovigilance activities are in the early stages of development, and the reporting of Adverse Drug Reactions (ADRs) is primarily limited to healthcare professionals [4].

G. Adverse Drug Reaction (ADR) reporting scenario in Pakistan

The Drug Regulatory Authority of Pakistan (DRAP) has launched the Pakistan National Pharmacovigilance Centre (PNPC). Given the limited resources in Pakistan's healthcare system, awareness levels regarding Adverse Drug Reaction (ADR) reporting were assessed among physicians (51%), pharmacists (29.7%), and nurses (19.3%). The findings

indicated that 65.5% of the healthcare professional (HCP) population observed ADRs, with only 57.4% reporting them in their respective hospitals. The actual number of deaths linked to ADRs remains unknown due to the underdeveloped state of the pharmacovigilance process. The pharmacovigilance system in Pakistan is still in its early stages, and the government has implemented various reforms to enhance the system [4].

V. RATIONAL SOLUTIONS

Tackling the pervasive problem of underreporting Adverse Drug Events (ADEs) necessitates a comprehensive and multifaceted approach that carefully considers the various factors contributing to this issue. One key strategy involves establishing a global consensus on the definitions, categories, and clinical significance of ADEs. This consensus would serve as a foundation for standardized reporting practices, enhancing communication and understanding across regulatory bodies and healthcare facilities worldwide[3].

Educational interventions emerge as a pivotal component of the solution. Offering training and education to both healthcare professionals and patients is crucial. This education should encompass ADE recognition, reporting processes, and the significance of feedback mechanisms. Health coaching can also prove effective, motivating individuals and instilling a sense of responsibility in the reporting of ADEs[15].

Improving the functionality and usability of electronic reporting systems is vital to counter underreporting. The development of user-friendly systems with clear instructions and guidance aims to facilitate effortless reporting for both healthcare professionals and patients. Ensuring readily available technical assistance and support helps address any challenges that may arise during the reporting process [16].

Expanding beyond traditional reporting methods, alternative data sources such as social media platforms, online patient forums, and electronic health records offer valuable avenues for collecting and generating information on ADEs. However, careful attention must be given to privacy concerns, and data mining algorithms should be meticulously designed and validated to ensure accuracy in the information gathered. Despite these strategies, underreporting of ADEs remains a substantial challenge. Continuous efforts are needed to enhance knowledge, attitudes, and reporting practices among healthcare professionals and patients. Through the effective implementation of these strategies and interventions, a more comprehensive understanding of medication safety can be achieved, ultimately leading to improved patient care outcomes[3].

VI. CONCLUSION

In conclusion, pharmacovigilance is a critical field that aims to identify, evaluate, comprehend, and prevent adverse effects associated with medications. The World Health Organisation (WHO) initiated global efforts through the Programme for International Drug Monitoring (PIDM) and the WHO Collaborating Centre for International Drug Monitoring (UMC) to standardize pharmacovigilance practices across 134 nations. Adverse drug reactions (ADRs) and adverse drug events (ADEs) pose significant challenges to public health, leading to morbidity, mortality, and escalating healthcare costs. Despite the establishment of ADR Monitoring Centres (AMCs), the underreporting of ADEs remains a pervasive issue worldwide. The article delves into the methods for identifying ADRs, categorizing them into combined, active, and passive strategies. Combined methods, utilizing various approaches like computerized ADR reporting systems and medical note reviews, enhance the identification of ADRs by complementing patient information. Active methods, such as computerized ADR reporting systems and medical note reviews, demonstrate reasonable rates of ADR detection, whereas spontaneous reporting, a passive method, exhibits lower rates.

Factors contributing to underreporting are multifaceted and include fear-based, knowledge-based, system-based, and organizational-based elements. Fear of adverse consequences, lack of knowledge, inadequate reporting systems, and organizational priorities contribute to a culture of silence and hinder comprehensive reporting. Patients and consumers also face barriers, such as a lack of motivation and limited access to reporting mechanisms.

The article emphasizes the global scenario of ADR reporting, showcasing varied practices in countries like India, the USA, Saudi Arabia, Bangladesh, Malaysia, Nepal, and Pakistan. Discrepancies in ADR reporting forms, inadequate resources, and awareness issues are evident in different nations.

To address underreporting, the article suggests rational solutions, including establishing a global consensus on ADE definitions, implementing educational interventions for healthcare professionals and patients, improving the functionality of electronic reporting systems, and exploring alternative data sources. Despite these strategies, challenges persist, and continuous efforts are crucial to enhancing knowledge, attitudes, and reporting practices, ultimately leading to improved patient care outcomes.

REFERENCES

[1]. Li Y, Wu Y, Jiang T, Xing H, Xu J, Li C, et al. Opportunities and challenges of pharmacovigilance in special populations: a narrative review of the literature. Vol. 14, Therapeutic Advances in Drug Safety. SAGE Publications Ltd; 2023.
[2]. Kalaiselvan V, Srivastava S, Singh A, Gupta S. Pharmacovigilance in India: Present Scenario and Future Challenges. Drug Saf. 2019 Mar 7;42(3):339–46.
[3]. Al Meslamani AZ. Underreporting of Adverse Drug Events: a Look into the Extent, Causes, and Potential Solutions. Vol. 22, Expert Opinion on Drug Safety. Taylor and Francis Ltd.; 2023. p. 351–4.
[4]. Dutta A, Banerjee A, Basu S, Chaudhry S. Analysis of under-reporting of Adverse Drug Reaction: Scenario in India and neighbouring countries. IP International

Journal of Comprehensive and Advanced Pharmacology. 2020 Oct 28;5(3):118–24.
[5]. Hazell L, Shakir SAW. Under-Reporting of Adverse Drug Reactions A Systematic Review. Vol. 29, Drug Safety. 2006.
[6]. Ramos SF, Alvarez NR, dos Santos Alcântara T, Sanchez JM, da Costa Lima E, de Lyra Júnior DP. Methods for the detection of adverse drug reactions in hospitalized children: a systematic review. Vol. 20, Expert Opinion on Drug Safety. Taylor and Francis Ltd.; 2021. p. 1225–36.
[7]. Mansouri A, Ahmadvand A, Hadjibabaie M, Javadi M, Khoee H, Dastan F, et al. A Review of Medication Errors in Iran: Sources, Underreporting Reasons and Preventive Measures. Vol. 13, Shaheed Beheshti University of Medical Sciences and Health Services Iranian Journal of Pharmaceutical Research. 2014.
[8]. Hartnell N, MacKinnon N, Sketris I, Fleming M. Identifying, understanding and overcoming barriers to medication error reporting in hospitals: A focus group study. BMJ Qual Saf. 2012 May;21(5):361–8.
[9]. García-Abeijon P, Costa C, Taracido M, Herdeiro MT, Torre C, Figueiras A. Factors Associated with Underreporting of Adverse Drug Reactions by Health Care Professionals: A Systematic Review Update. Vol. 46, Drug Safety. Adis; 2023. p. 625–36.
[10]. Al Dweik R, Stacey D, Kohen D, Yaya S. Factors affecting patient reporting of adverse drug reactions: a systematic review. Br J ClinPharmacol. 2017;83(4):875–83.
[11]. Mulchandania R, Kakkar AK. Reporting of adverse drug reactions in India: A review of the current scenario, obstacles and possible solutions. Vol. 30, International Journal of Risk and Safety in Medicine. IOS Press; 2018. p. 33–44.
[12]. Nadew SS, Michael Beyene KG, Beza SW. Adverse drug reaction reporting practice and associated factors among medical doctors in government hospitals in Addis Ababa, Ethiopia. PLoS One. 2020 Jan 1;15(1).
[13]. Bandekar MS, Anwikar SR, Kshirsagar NA. Quality check of spontaneous adverse drug reaction reporting forms of different countries. Pharmacoepidemiol Drug Saf. 2010 Nov;19(11):1181–5.
[14]. Aldryhim AY, Alomair A, Alqhtani M, Mahmoud MA, Alshammari TM, Pont LG, et al. Factors that facilitate reporting of adverse drug reactions by pharmacists in Saudi Arabia. Expert Opin Drug Saf. 2019 Aug 3;18(8):745–52.
[15]. Vallano A, Cereza G, Pedròs C, Agustí A, Danés I, Aguilera C, et al. Obstacles and solutions for spontaneous reporting of adverse drug reactions in the hospital. Br J ClinPharmacol. 2005 Dec;60(6):653–8.
[16]. Thom DH, Willard-Grace R, Hessler D, DeVore D, Prado C, Bodenheimer T, et al. The impact of health coaching on medication adherence in patients with poorly controlled diabetes, hypertension, and/or hyperlipidemia: A randomized controlled trial. Vol. 28, Journal of the American Board of Family Medicine. American Board of Family Medicine; 2015. p. 38–45.