

KNOWLEDGE AND PRACTICE OF ADVERSE EVENTS FOLLOWING IMMUNIZATION (AEFI) REPORTING AMONG NURSING MOTHERS IN EKITI STATE, NIGERIA

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Abstract

Adverse events following immunization (AEFI) can lower vaccine confidence if they are not adequately monitored and reported. However, nursing mothers' status of awareness and knowledge about reporting is yet to be explored in most parts of Ekiti State. This study examined knowledge and practice of AEFI reporting among nursing mothers. A descriptive cross-sectional survey was carried out among 1,200 nursing mothers which were randomly selected using multistage sampling procedure from among those visiting immunization clinics in 12 primary health facilities located in Ekiti State. Data were collected through a structured pretested questionnaire. Descriptive statistics was used to analyze the research questions Findings of this study revealed that majority of the mothers (60.7%) are aware that they are to report adverse events following immunization noticed in their babies by going back to the health facility. Also, 59.2% of the respondents reported that they often take their babies back to the health facility whenever there is vaccine reaction. Pain on injection and swelling on injection site (mean=2.57) were most frequently reported AEFI. Only 28.4% of the mothers were aware of official reporting outlets, whereas 62.7% thought adverse events must be reported in an unofficial way to neighbors or family members. Also, it was further revealed that knowledge was a strong predictor of AEFI ($\beta = 0.214$, $p < 0.05$). It is therefore recommended that routine AEFI reporting education should be incorporated into primary health care services so as to enhance the knowledge and reporting practices of AEFI among nursing mothers.

Key words: Knowledge, Awareness, Adverse Events, Immunization, Nursing Mothers

Introduction

Immunization is globally accepted as a most efficient and cost-effective public health intervention to prevent communicable diseases and child deaths globally. It is projected to prevent 2–3 million deaths each year and play a significant role in meeting global health goals and improving health systems (UNICEF, 2025). Notwithstanding these achievements, adverse events following immunization (AEFI) have long been a thorn in the flesh. AEFIs

as medical events that happen following a vaccine administration either that is or is not causally connected could have a negative effect on programme coverage of immunization if not appropriately censured and reported (Klaيمان *et al.*, 2016; Omoleke *et al.*, 2023).

Successful vaccine safety monitoring is dependent on timely and accurate AEFI reporting through health workers and caregivers. AEFI monitoring is a subject of importance in enhancing it as emphasized by the

World Health Organization to strengthen in low- and middle-income countries where underreporting is a significant challenge (**Adedire *et al.*, 2016**). Mothers being the chief guardians of children are also core to this activity as they are most likely to realize strange reactions following immunization. Their understanding of AEFI and how to report are thus important to the operation of vaccine pharmacovigilance systems (**Tagbo *et al.*, 2012**).

In Nigeria, National Programme on Immunization found frameworks of AEFI reporting surveillance, but various studies have indicated that underreporting is ongoing (**Aiman *et al.*, 2023**; **Ansah *et al.*, 2025**). Documentation from evidence in Lagos indicated that most of the mothers could mention common side effect with fewer of them knowing where or how to report AEFI (Ogundele *et al.*, 2023). Similarly, a study from Kaduna State indicated that poor awareness of how to report was a significant contribution to low levels of reporting among caregivers (Ishaku *et al.*, 2021). These studies indicate systemic gaps in knowledge and awareness of AEFI reporting among nursing mothers.

Recent literature validates that Knowledge and awareness gaps are no exception to Nigeria. For instance, a survey of Southwest Nigerian mothers revealed that while more than a third attested that their offspring had had an AEFI, fewer than half possessed sufficient information about systems of reporting (Ogundele *et al.*, 2023). Assessment of vaccine safety surveillance systems in northern Nigeria found that although providers were aware of its

possibility, deficiencies in providing feedback and ambiguity of processes of reporting made monitoring ineffective (Omoleke & de Kiev, 2024). Similarly, comparable results have been revealed from other low-resource environments, which reassert its international significance (Ansah *et al.*, 2025).

Theoretical frameworks like Health Belief Model and Theory of Planned Behaviour opine that health-seeking behaviour in regard to adverse events, such as through reporting, is influenced by people's information, perceived severity of events, and availability of filing mechanisms known to them (Ogundele *et al.*, 2023). For AEFI, mothers' ability to recognize potential adverse events and understand how to report them may significantly influence whether such events are formally documented. Reinforcing these behavioural factors has thus been advocated as an intervention to enhance filing compliance as a measure of vaccine safety (Erekosima *et al.*, 2025).

Even as this is a critical matter, little empirical work has been done from Ekiti State, Nigeria, about nursing mothers' awareness and information of AEFI reporting. Filling this gap is crucial in informing activities that strengthen vaccine safety monitoring in the state and that expand country and worldwide immunization aims. This study aimed to assess nursing mothers' knowledge, awareness, and reporting practice of AEFI in Ekiti State. It examined recognition of common AEFI, awareness of official reporting channels, and predictors of reporting behaviour. The hypothesis tested whether knowledge significantly influences AEFI reporting behaviour among nursing mothers.

Objectives of the Study

1. To assess the knowledge of reporting of adverse events following immunization among nursing mothers in Ekiti State
2. To determine the AEFI reporting practices commonly adopted among nursing mothers in Ekiti State
3. To determine the most common AEFI reported among nursing mothers in Ekiti State Nigeria

Research Questions

- i. What is the knowledge of reporting of AEFI among nursing mothers in Ekiti State?
- ii. What are the AEFI reporting practices commonly adopted among nursing mothers in Ekiti State?
- iii. What are the most common AEFI reported among nursing mothers in Ekiti State Nigeria?

Methodology

This study adopted a descriptive cross sectional survey design. The existing situation of knowledge and perception of adverse events following immunization (AEFI) reporting among nursing mothers in Ekiti State was described to achieve the aim of obtaining the existing situation, without any manipulation of the variables. The population of the study was nursing mothers whose children had ages of 0-24 months and were visiting immunization centers during the time of the study. Only informed consenting nursing mothers who had lived in the region at least six months were taken into the study, and severely ill or unwilling ones were excluded.

The sample size for this study was 1,200 nursing mothers. These

were selected using a multi-stage sampling procedure. In the first stage, two Local Government Areas (LGAs) were randomly selected from each of the three senatorial districts in Ekiti State making six LGAs. In the second stage, 4 primary health care facilities were randomly selected from each of the selected LGAs to make a total of twenty four primary health care facilities. In the third stage, 50 nursing mothers were selected using convenient sampling technique from each of the selected primary health care facilities to make a total of 1,200 respondents

The instrument for data collection in this study was a structured and validated questionnaire having 4 sections with a reliability coefficient of 0.87. Section A of the instrument was used to elicit information on the socio-demographic features of the respondents. Section B contains 10 items on knowledge and channels of reporting AEFI with options Yes, No and I don't know. Section C contains 5 items on practice of Adverse Events Following Immunization reporting with options Yes, No and I can't remember. Section D contains 10 items on signs of Adverse Events Following Immunization with options Yes, No and I can't remember. The survey was conducted between May and July 2023 through the use of trained research assistants who were Community Health Officers and public health professionals. On the spot method of data collection was adopted and data analysis was carried out using SPSS version 16. Descriptive statistics was used to analyze the research questions.

Ethical Approval

This research was ethically approved by the Ekiti State Ministry of Health Ethics Review Board (Approval No. EK/MH/ETHICS/2023/07). The State Primary Health Care Development Agency and the authorities of the health facilities in which the study took place also provided permission to carry out the study. All respondents were informed of this and gave informed consent. It

was a strictly voluntary participation. Privacy and confidentiality were maintained by not including any form of identifying information in the questionnaire, and also by ensuring that the data collected was handled in a secure manner.

Results

Research Question 1: What is the knowledge of reporting of AEFI among nursing mothers in Ekiti State

Table 1: Knowledge and Channels of reporting AEFI among nursing mothers in Ekiti State, Nigeria

S/N	Questions	Yes (%)	No (%)	I don't know (%)	Mean
1	I am to report adverse events following immunization notice in my baby by going back to the health facility	728 (60.7)	364 (30.3)	108 (9.0)	2.52
2	I can report by sending any of my family members to the health facility	696 (58.0)	298 (24.8)	206 (17.2)	2.41
3	I am to report any strange sign noticed on my baby after vaccination	543 (45.3)	458 (38.2)	199 (16.6)	2.29
4	I can report adverse events following immunization through phone calls	672 (56.0)	320 (26.7)	208 (17.3)	2.39
5	I can use WhatsApp messaging to report negative reactions to vaccinations.	573 (47.8)	433 (36.1)	194 (16.2)	2.32
6	Text message is cheaper for me to report adverse events following immunization	674 (56.2)	339 (28.2)	187 (15.6)	2.41
7	My prompt report of vaccine reaction is required to prevent complications that could result from untreated adverse events following immunization.	573 (47.8)	414 (34.5)	213 (17.8)	2.30
8	Lack of consistency in mothers reporting immunization reactions after can affect data collection.	812 (67.7)	233 (19.4)	155 (12.9)	2.55
9	Low or inadequate reporting of immunization reactions by me can prevent government from taking appropriate decisions on vaccine safety	572 (47.7)	519 (43.3)	109 (9.1)	2.39
10	I am to report all vaccine reactions either serious or non- serious	765 (63.8)	91 (7.6)	344 (28.7)	2.35

Table 1 presents the knowledge and channels of reporting

Adverse Events Following Immunization (AEFI) among

nursing mothers in Ekiti State. Table 1 shows that majority of the mothers (60.7%) are aware that they are to report adverse events following immunization notice in their babies by going back to the health facility. Also. Many of the nursing mothers are of the opinion that reporting

AEFI could be done through family members (58.0) %, text messages (56.2%) or phone calls (56.0%).

Question 2: What are the AEFI reporting practices commonly adopted among nursing mothers in Ekiti State?

Table 2: AEFI Reporting Practices among Nursing Mothers in Ekiti State

S/N	Questions	Yes (%)	No (%)	I can't remember (%)	Mean
1	I took my baby back to the health facility whenever there is vaccine reaction.	710 (59.2)	367 (30.6)	123 (10.3)	2.50
2	I reported any strange signs seen in my baby after vaccination	667 (55.6)	415 (34.6)	118 (9.8)	2.46
3	I only report serious cases of vaccine reaction	379 (31.6)	671 (55.9)	150 (12.5)	2.19
4	I reported only when it is convenient for me	420 (35.0)	551 (45.9)	229 (19.1)	2.16
5	I reported both serious and non-serious reactions	482 (40.2)	588 (49.0)	130 (10.8)	2.29

Table 2 shows that 59.2% of the nursing mothers often take their babies back to the health facility whenever there is vaccine reaction.

Research Question 3: What are the commonest types of AEFI reported among nursing mothers in Ekiti State?

Table 3: Commonly Reported AEFI among Nursing Mothers

S/N	Questions	Yes (%)	No (%)	I can't remember (%)	Mean	SD.	Rank
1	Hotness of the body	658 (54.8)	347 (28.9)	195 (16.3)	2.39	.750	7 th
2	Pain at injection site	744 (62.0)	402 (33.5)	54 (4.5)	2.57	.578	2 nd
3	Swelling	732 (61.0)	426 (35.5)	42 (3.5)	2.57	.561	1 st
4	Rash	643 (53.6)	513 (42.8)	44 (3.7)	2.50	.569	4 th
5	Persistent crying	676 (56.3)	473 (39.4)	51 (4.3)	2.52	.579	3 rd
6	Convulsion	630 (52.5)	514 (42.8)	56 (4.7)	2.48	.586	5 th
7	weakness of the limb	412 (34.3)	646 (53.8)	142 (11.8)	2.22	.641	9 th
8	Difficulty in breathing	384 (31.8)	647 (53.9)	171 (14.3)	2.18	.656	10
9	Ulcer	419 (34.9)	725 (60.4)	56 (4.7)	2.30	.552	8 th
10	Paralysis	514 (42.8)	639 (53.3)	47 (3.9)	2.39	.562	6 th

Table 3 shows that the most common AEFI commonly reported among nursing mothers in Ekiti State is swelling and pain at injection site (mean=2.57)

Discussion

The results of real-life reporting support previous findings of the knowledge and awareness of adverse events after immunization of nursing mothers in Nigeria. The reluctance of most mothers in this study to visit the health facility when their infants underwent vaccine reactions (59.2%) can be attributed to trends reported in Lagos and Ile-Ife where Ogundele *et al.* (2023) have also found that mothers have a low tendency to go to the health facility immediately noticeable changes are experienced by their infants. The willingness of the mothers to report the manifestation of strange signs (55.6%) also shows a baseline level of attention, not unlike the more general Nigerian data that any minor or anticipated AEFI are readily identified and responded to by the appropriate caregivers. Nevertheless, the fact that respondents unable to remember their actions also appeared highlights one of the weaknesses also mentioned in Kaduna State (Ishaku *et al.*, 2021), in which case recall limits and uncertainty also played a role in under-reporting of severe AEFI. It implies that, as in the rest of states in Nigeria, although the expression of common vaccine reactions was sufficiently identified, there are still lapses in reporting behaviours because of the lapses in ongoing education and communication.

The trend of answers to the question of the form and time of reporting also contributes to the current results throughout the region. The reason why most said they would not report only

serious reactions (55.9%) is reflective of what Ogundele *et al.* (2023) reported, who noted that mothers tend to recognize mild AEFI but fail to maintain regular reporting patterns. Despite the fact that less than half of the respondents of this research have mentioned both serious and non-serious reactions, the moderate mean scores (2.16 2.29) indicate the same negative and positive interaction of behavioural patterns observed in Ethiopia (Alemu and Maja, 2023), where a poor comprehension of formal reporting requirements discouraged full reporting. These parallels in various settings suggest that augmenting recognition and organizing better communication when having an immunization session are crucial to enhancing the reporting coverage.

The study further explains the first-hand experience of mothers with certain AEFI. Ratings of swelling (61.0%) and pain at the site of injection (62.0%), the first and the second, are supported by the results of the study by Ogundele *et al.* (2023) who state that they are the most common and easily identified responses of mothers in southwestern Nigeria. Rash, intractable crying and fever are also common phenomena, which echo the reports on Lagos and Kaduna that mothers normally recognize these mild and common phenomena that are AEFI easily. The medium level of variability, as it is indicated by the standard deviations, aligns with the perception that such frequent reactions are known, much discussed in the time of immunization visit, and are typical expectations of mothers.

The low reporting percentages of more severe reactions like difficulty breathing, limb weakness, formation of ulcers, and paralysis, on the other hand, are also in line with the worries of Ishaku *et al.*

(2021) that the perception of severe AEFI is low. Standard deviations used to display these rare events are also higher and again, this points to uncertainty or inconsistency, as the earlier findings that showed that such symptoms have been missed or are not well comprehended by mothers. As has been mentioned in research by Nigeria and Ethiopia, this unwillingness or inability to recognize severe AEFI could be a result of the lack of communication in the process of vaccinating and the lack of facing structured AEFI instructions. The data thus agrees with the regional data on the general awareness of mothers concerning the common post-immunization reactions however, specific interventions especially when conducting routine immunization health talks are needed to enhance awareness and reporting of the less frequent though clinically important adverse events.

Conclusion

Based on the findings of this study, it could be concluded that nursing mother in Ekiti State had good understanding of frequent adverse events following immunization but poor understanding of appropriate reporting systems. Knowledge proved to be a strong predictor of reporting practice, suggesting that educated mother are more likely to report notable events.

Recommendations

1. Group counselling on AEFI, providing clear instructions on available reporting channels should be intensified in post natal health facilities.
2. Health talks should include detailed information on AEFI reporting, while health workers should be supported to prioritize timely reporting.

3. Caregiver awareness should be improved through community campaigns and facility-based education. Implementing targeted awareness initiatives will strengthen reporting practices, improve vaccine safety surveillance, build public trust, and support high immunization coverage.

References

- Adedire, E. B., Ajayi, I., Fawole, O. I., Ajumobi, O., Kasasa, S., Wasswa, P., & Nguku, P. (2016). Immunisation coverage and its determinants among children aged 12–23 months in Atakumosa-West District, Osun State, Nigeria: A cross-sectional study. *BMC Public Health*, 16(1), 905. <https://doi.org/10.1186/s12889-016-3566-z>
- Aiman, S., Ahmad, A., Khan, A., Ali, Y., Malik, A., Alkholief, M., Akhtar, S., Khan, R. S., Li, C., Jalil, F., & Ali, Y. (2023). Vaccinomics-aided next-generation novel multi-epitope-based vaccine engineering against multidrug-resistant *Shigella sonnei*: Immunoinformatics and chemoinformatics approaches. *PLOS ONE*, 18(11), e0289773. <https://doi.org/10.1371/journal.pone.0289773>
- Alemu, M. A., & Maja, T. (2023). Challenges and solutions of immunization safety surveillance in Assosa Zone, Ethiopia: Mixed methods. *Research Journal of Medical and Health Sciences*, 4(1). <https://doi.org/10.58256/rjmhs.v4i1.982>
- Ansah, N. A., Weibel, D., Chatio, S. T., Oladokun, S. T., Duah, E., Ansah,

- P., Oduro, A., Hollestelle, M., & Sturkenboom, M. (2025). Barriers and strategies to improve vaccine adverse events reporting: Views from health workers and managers in Northern Ghana. *BMJ Public Health*, 3(1). <https://doi.org/10.1136/bmjph-2024-000567>
- Bawa, S. B., Olumide, E. A., & Umar, U. S. (2003). The knowledge, attitude and practices of the reporting of notifiable diseases among health workers in Yobe State, Nigeria. *African Journal of Medicine and Medical Sciences*, 32(1), 49–53.
- Erekosima, G. F., Isiaka, S. D., Oni, F., Garba, A. R., Bassey, O., Asaolu, S. O., Samuel, O. W., Ozioko, G., Ayodeji, O. A., Agomuo, E. C., & Okoye, I. O. (2025). Perception of healthcare administrators on the impediments of optimizing adverse events following immunization e-reporting in Nigeria. *PLOS ONE*, 20(8), e0331093. <https://doi.org/10.1371/journal.pone.0331093>
- Ishaku, S. G., Umeh, G., Adzu, B., Onimisi, A., Dauda, M., Iyal, H. A., Iliyasu, N., Sunday, D. J., Daikwo, J., Yates, S. M., & Ibrahim, I. I. (2021). Adverse event following vaccine surveillance in Kaduna State, Northwestern Nigeria (January 2018–June 2019): Analysis of health facility records. *Pan African Medical Journal*, 40(1). <https://doi.org/10.11604/pamj.2021.40.1.30442>
- Klaiman, T., Pantazis, A., Chainani, A., & Bekemeier, B. (2016). Using a positive deviance framework to identify local health departments in communities with exceptional maternal and child health outcomes: A cross-sectional study. *BMC Public Health*, 16(1), 602. <https://doi.org/10.1186/s12889-016-3252-9>
- Ogundele, O. A., Fehintola, F. O., Salami, M., Usidebhofoh, R., & Abaekere, M. A. (2023). Prevalence and patterns of adverse events following childhood immunization and the responses of mothers in Ile-Ife, South West Nigeria: A facility-based cross-sectional survey. *Osong Public Health and Research Perspectives*, 14(4), 291–299. <https://doi.org/10.24171/j.phrp.2023.0190>
- Omoleke, S. A., & de Kiev, L. C. (2024). An evaluation of the surveillance system for monitoring and reporting adverse events following immunization in Kebbi State, Northern Nigeria: A mixed-method approach. *BMC Public Health*, 24(1), 2906. <https://doi.org/10.1186/s12889-024-19164-8>
- Omoleke, S. A., Bamidele, M., & de Kiev, L. C. (2023). Barriers to optimal AEFI surveillance and documentation in Nigeria: Findings from a qualitative survey. *PLOS Global Public Health*, 3(9), e0001658. <https://doi.org/10.1371/journal.pgph.0001658>
- Tagbo, B. N., Uleanya, N. D., Nwokoye, I. C., Eze, J. C., & Omotowo, I. B. (2012). Mothers' knowledge, perception, and practice of childhood immunization in Enugu. *Nigerian Journal of Paediatrics*,

- 39(3), 90–96.
<https://doi.org/10.4314/njp.v39i3.1>
- UNICEF. (2025, September 30). Immunization. UNICEF.
<https://www.unicef.org/immunization>
- World Health Organization. (2016). *Immunization safety surveillance: Guidelines for immunization programme managers on surveillance of adverse events following immunization* (3rd ed.).
<https://www.who.int/publications/i/item/9789290617457>