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***Original Article***

# Knowledge and Communication of Adverse Reactions Following Immunization among Caregivers and Health Workers in Ilorin, Nigeria

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**ABSTRACT**

**Background:** Adverse Reactions Following Immunization (ARI) remain a critical factor influencing public confidence in vaccination programs, particularly in developing nations. This study examined caregivers' and healthcare workers' (HCWs) knowledge, perceptions, and communication practices concerning ARI in Ilorin Metropolis, Nigeria.

**Methods:** A convergent parallel mixed-methods design was adopted, involving a survey of 360 caregivers and qualitative interviews with nine HCWs and three focus group discussions with caregivers from selected Primary Health Centres (PHCs) across Ilorin East, West, and South Local Government Areas (LGAs). Quantitative data were analyzed using SPSS version 26, while qualitative data underwent thematic analysis using MAXQDA 2020.

**Results:** Results showed that 78.9% of caregivers demonstrated adequate knowledge of ARI; 86.9% recognized fever and 72.8% identified soreness as common post-vaccination reactions. However, despite 95.3% acknowledging ease of reporting, only 38.4% of those who experienced ARI reported them. Hesitancy occurred in 59.2% of caregivers and, largely due to misinformation and cultural beliefs, while 90% gained confidence through supportive communication with HCWs.

**Conclusion:** Findings highlight the pivotal role of effective communication and training in sustaining immunization confidence.

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## Introduction

Immunization remains one of the most cost-effective public health strategies, preventing millions of deaths annually worldwide (World Health Organization [WHO], 2023). Despite its success, the occurrence of AEFIs can undermine public trust and contribute to vaccine hesitancy (Hervé *et al*., 2019; Stone *et al*., 2019). AEFIs include any untoward medical event following vaccination, whether or not causally related to the vaccine. The adverse event may be any unfavorable or unwanted sign, abnormal laboratory finding, symptom, or disease that occurs after Immunization World Health Organization (WHO, 2019; WHO, 2018).

An Adverse Reaction Following Immunization (ARI) refers to an event that is caused by the vaccine itself or by the vaccination process. In other words, it is a causally related adverse event resulting directly from the vaccine's inherent properties or improper administration World Health Organization (WHO, 2019; Centre for Disease Control and Prevention (CDC, 2021).

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In Sub-Saharan Africa, childhood vaccination has significantly reduced disease prevalence, yet coverage remains below global benchmarks. Tracking AEFIs poses a unique challenge in this area (Bangura *et al.,* 2020). According to a 2015 World Health Organization report, less than one percent of global reaction reports come from Africa, with the majority originating from only a handful of countries, suggesting that many incidents go unreported (WHO, 2015). Numerous countries fail to achieve the target of documenting 10 reactions per 100,000 surviving infants each year, primarily due to insufficient resources, inadequate training, and fragile data systems (Laryea *et al.,* 2022; Omoleke *et al.,* 2023). Healthcare professionals often face challenges such as being overburdened or fearing repercussions, which obstruct accurate reporting. Additionally, parental apprehensions regarding vaccine safety can result in lower vaccination rates (Gopalan *et al.,* 2025; Wiot *et al.,* 2019). Some programs that introduce new childhood vaccines have demonstrated that training and community engagement can be beneficial, yet issues in managing reactions persist, undermining confidence in vaccination initiatives (Dhaliwal *et al.,* 2023; Kaufman *et al.,* 2024).

In Nigeria, a pivotal hub for childhood vaccination in Sub-Saharan Africa, millions of children receive vaccinations annually, but monitoring AEFIs highlights both advancements and persistent obstacles (Olaniyan *et al.,* 2022). More than half of healthcare providers have a solid understanding of these reactions; however, only around 18 percent of incidents are reported, impeded by factors such as excessive workloads, fear of accountability, or inadequate reporting mechanisms (Mohammed *et al.,* 2018). Parents often express concerns about AEFIs in their children, which can lead to reluctance in continuing vaccinations, particularly if healthcare providers do not provide clear information (Etim *et al.,* 2025). Trust in healthcare providers, access to reliable information, and past experiences with reactions strongly influence parental decisions to vaccinate their children (Bangura *et al.,* 2020).

Globally, surveillance of AEFIs plays a central role in maintaining confidence in immunization systems (Shattock *et al*., 2024). However, in sub-Saharan Africa, reporting systems remain weak, with less than 1% of global AEFI reports originating from the region (Bangura *et al*., 2020; Laryea *et al*., 2022). In Nigeria, studies reveal that while many HCWs possess basic AEFI knowledge, under-reporting persists due to resource limitations and inadequate training (Mohammed *et al*., 2018; Omoleke *et al.*, 2023).

Misinformation, cultural interpretations, and negative experiences also shape caregiver perceptions, influencing vaccine uptake and trust (Etim *et al*., 2025; Olorunsaiye *et al*., 2025). This study, therefore, assesses ARI knowledge and communication patterns among caregivers and HCWs in Ilorin Metropolis, providing evidence to inform strategies for strengthening vaccine safety confidence in Nigeria.

The objectives of this study include:

To explore the knowledge and perceptions of parents and HCWs regarding the types, causes, and severity of ARI

To examine the factors contributing to vaccine hesitancy or acceptance among parents, as influenced by ARI and interactions with HCWs

To investigate the communication strategies and information exchange between HCWs and parents concerning ARI and its prevention

**Methods**

Study Design and Setting: A convergent parallel mixed-methods study was conducted in nine PHCs across Ilorin East, Ilorin West, and Ilorin South Local Government Areas (LGAs) of Ilorin Metropolis, Kwara State, Nigeria.

Study Population and Sampling: The study population comprised caregivers of children aged 0–5 years receiving routine childhood vaccinations, and HCWs involved in immunization programs. The calculated minimum sample size for caregivers was 354, rounded up to 360 using Caregivers were selected using a multi-stage sampling technique, involving systematic random sampling within the selected PHCs. Qualitative data involved 3 FGDs (one per LGA) with caregivers and 9 KIIs (1 HCW, 1 RI Officer, 1 OIC per LGA) with HCWs, chosen purposively for expertise and data saturation.

**Research Instrument**

**Data Collection Methods:** A structured questionnaire consisting of 6 sections (sociodemographic, knowledge/perceptions, barriers/facilitators, experiences, hesitancy/acceptance, communication) was given to caregivers in Yoruba through oral translation at 9 PHCs, with answers documented in English.

Qualitative data were gathered through 3 Focus Group Discussions (FGDs, one for each LGA, with 6–8 caregivers in each) and 9 Key Informant Interviews (KIIs, including 1 HCW, 1 RI Officer, and 1 OIC per LGA) conducted in Yoruba using English semi-structured guides, which are audio-recorded, transcribed, and then translated into English.

**Training of Assistants:** Nine research assistants, skilled in Yoruba-English oral translation, administering questionnaires, and obtaining ethical consent, gather quantitative data. The researcher

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herself conducted the FGD/KII with a trained research assistant, who assisted in the audio recordings.

**Validity:** Experts in research methodology and my supervisor provided their insights regarding the face and content validity of the data collection tool for this study. All suggested corrections were implemented before the final version of the instrument was created. Questionnaires and guides underwent pre-testing in a pilot in Ogele PHC in Asa LGA with 36 respondents (caregivers), were refined for clarity, and validated against the study's objectives. The qualitative guides are consistent with the constructs of the Health Belief Model for content validity.

**Reliability of instrument**: The reliability test for the study instrument was tested using Cronbach's Alpha reliability test on each section. Furthermore, an overall reliability test was carried out on all sections, with the findings below.

**Table 1: Reliability test**

| S/N | Section | Cronbach's Alpha | No of questions |
|---|---|---|---|
| 1 | Knowledge of AEFI | 0.70 | 6 |
| 2 | Barriers and Facilitators in Reporting, Management, and Response | 0.43 | 6 |
| 3 | Experiences Towards Childhood AEFI | 0.40 | 5 |
| 4 | Factors Contributing to Vaccine Hesitancy or Acceptance | 0.68 | 5 |
| 5 | Communication Strategies and Information Exchange | 0.86 | 4 |
| 6 | Total | 0.71 | 27 |

**Measurement of Variables and Data Processing**

**Independent Variables:** Sociodemographic, knowledge/perceptions, barriers/facilitators, experiences, hesitancy/acceptance, and communication strategies, measured via English questionnaires (Yoruba-administered, Likert/multiple-choice) and thematic coding of translated Yoruba FGD/KII transcripts.

**Dependent Variable:** Adverse Event Following Immunization (AEFI).

**Data Processing:** Quantitative data were processed, organized, and analyzed using SPSS (for instance, frequencies and chi-square tests for hypothesis evaluation). The qualitative Yoruba audio recordings are transcribed, translated into English, and categorized through directed content analysis (Hsieh & Shannon, 2005) into themes and subthemes that correspond with the study objectives, and analyzed with MAXQDA version 2020.

**Data Analysis Method**

Quantitative data collected from caregiver questionnaires are processed, organized, and analyzed using SPSS 26, employing descriptive statistics (frequencies and percentages) for sociodemographic information, knowledge, and experiences, as well as inferential statistics (chi-square tests) to examine relationships between sociodemographic factors and the reporting of AEFIs.

Pre-established themes and subthemes (such as susceptibility and barriers) are categorized, with new categories created as necessary, and the frequency of mentions is evaluated (Vaismoradi *et al.,* 2013). The findings are synthesized through joint displays to compare the quantitative and qualitative outcomes, ensuring all objectives are met.

**Ethical Consideration**

Ethical approval was granted by the Kwara State Ministry of Health Ethics Review Board. Informed consent was obtained from all participants (caregivers for questionnaires/FGDs, HCWs for KIIs) in Yoruba, detailing the study's purpose, voluntary participation, and confidentiality. Anonymity is maintained by assigning codes to responses and transcripts, with data being stored securely. The process of translating from Yoruba to English was explained to participants to ensure transparency, and there was no harm or coercion involved, in accordance with ethical research standards for vulnerable populations in Ilorin Metropolis. Ministry of Health Ethical Research Committee assigned Number: ERC/MOH/2025/09/507

**Results**

Among the 360 caregivers, 76.7% were aged 25–35 years, and 93.6% were married. Half (50.3%) had secondary education, and 65.6% were self-employed. Overall, 78.9% demonstrated adequate ARI knowledge with fever (86.9%) and soreness (72.8%) being the most recognized post-vaccination reactions. Nearly all caregivers (96.4%) agreed that mild

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reactions were normal and not harmful, while most (81.1%) knew severe reactions (e.g., breathing difficulties) required immediate attention. Nearly all (96.4%) affirm vaccines importance despite mild effects, and most (85%) understand that mild reactions resolve within days.

Despite high awareness, only 38.4% of those whose children experienced ARIs reported them. Reporting was significantly associated with higher education and caregiver age ($p < 0.05$). Qualitative findings revealed that most caregivers viewed ARIs as temporary, often managed through home remedies such as tepid sponging.

Results reveal that the vast majority, 343 (95.3%) find it easy to report reactions (e.g., fever, soreness) to healthcare workers (HCWs), with only 15 (4.2% finding it difficult. Close to one-sixth 53 (14.7% fear blame for reporting side effects, while most 302 (83.9%) do not. The vast majority 313 (86.9%) are confident managing mild reactions (e.g., with rest, medicine), and most 322 (89.4%) agree pre-vaccination HCW discussions enhance preparedness. Over nine-tenths 330 (91.7%) believe reporting vaccine safety, but one quarter 91 (25.3%) face access barriers to clinics for serious reactions.

Results demonstrate that over half 213 (59.2%) agree adverse reactions influence vaccination decisions, and nine-tenths 324 (90%) note positive HCW interactions (e.g., empathy) increase confidence. Close to three-fifths 209 (58.1%) are more hesitant due to frequent/severe side-effect reports, while nine-tenths favor acceptance with detailed benefit-risk information from HCWs. Close to half 156 (43.3%) say dismissive HCW responses reduce vaccination likelihood, and nearly two-thirds 234 (65%) report personal/other experiences shape decisions.

The results indicate that over nine-tenths 326 (90.6%) agree HCWs provide clear information on reactions and management, and most 303 (84.2%) note proactive discussions on prevention (e.g., fever management). Most 310 (86.1%) report HCWs address concerns thoroughly and respectfully, while over three-quarters 277 (76.9%) receive accessible resources (e.g., pamphlets, follow-up contacts).

Cultural beliefs, fear of extreme reactions, and ignorance were the main causes of hesitancy, which was seen in 59.2% of caregivers, especially in Hausa and Fulani communities (Etim et al., 2025). Conversely, 90% of caregivers expressed increased confidence in vaccination following effective communication from HCWs who used empathetic approaches, pre-vaccination counselling, and follow-up calls.

**Table 1: Knowledge and Perceptions of ARI (N=360)**

| Knowledge questions | Yes n (%) | No n (%) | I don't know n (%) |
|---|---|---|---|
| Is it common for a child to have a sore arm or redness at the spot where they got a vaccine? | 262 (72.8) | 78 (21.7) | 20 (5.6) |
| Can a child have a mild fever or feel warm for a day or two after getting a vaccine? | 313 (86.9) | 34 (9.4) | 13 (3.6) |
| Do you agree that mild side effects, like a low fever or tiredness in a child after a vaccine, are usually normal and not harmful? | 314 (87.2) | 35 (9.7) | 11 (3.1) |
| Should a child see a doctor right away if they have serious problems, like trouble breathing or swelling in their face, after a vaccine? | 292 (81.1) | 60 (16.7) | 8 (2.2) |
| Do you agree that vaccines are important to protect children from serious diseases, even if they might cause mild side effects for a short time? | 347 (96.4) | 13 (3.6) | 0 (0) |
| Do mild side effects, like a headache or a sore arm in a child after a vaccine, usually go away on their own within a few days? | 306 (85) | 41 (11.4) | 13 (3.6) |

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**Table 2: Factors Contributing to Hesitancy or Acceptance (N=360)**

| Variables | Agree n (%) | Disagree n (%) | Undecided n (%) |
|---|---|---|---|
| I believe that experiencing or hearing about adverse reactions after vaccination significantly affects my decision to vaccinate my child. | 213 (59.2) | 109 (30.3) | 38 (10.6) |
| Positive interactions with healthcare workers, such as clear communication and empathy, increase my confidence in vaccinating my child. | 324 (90) | 25 (6.9) | 11 (3.1) |
| I am more hesitant to vaccinate my child if I hear about frequent or severe side effects following vaccinations. | 209 (58.1) | 135 (37.5) | 16 (4.4) |
| I am more likely to accept vaccines for my child if healthcare workers provide detailed and accurate information about the vaccine's benefits and risks. | 324 (90) | 31 (8.6) | 5 (1.4) |
| If healthcare workers dismiss my concerns or provide unclear information, I am less likely to vaccinate my child. | 156 (43.3) | 153 (42.5) | 51 (14.2) |
| My decision to vaccinate or not vaccinate my child is influenced by my own or others' experiences with side effects after vaccination. | 234 (65) | 74 (20.6) | 52 (14.4) |

**Table 3: Communication Strategies and Information Exchange (N=360)**

| Variables | Agree n (%) | Disagree n (%) | Undecided n (%) |
|---|---|---|---|
| Healthcare workers provide clear and understandable information about potential AEFIs and how to manage them. | 326 (90.6) | 14 (3.9) | 20 (5.6) |
| Healthcare workers proactively discuss ways to prevent or minimize AEFIs, such as fever or discomfort, before vaccinating my child. | 303 (84.2) | 34 (9.4) | 23 (6.4) |
| When I raise questions or concerns about AEFIs, healthcare workers address them thoroughly and respectfully. | 310 (86.1) | 24 (6.7) | 26 (7.2) |
| Healthcare workers provide accessible resources (e.g., pamphlets, websites, or follow-up contacts) to help me understand and manage AEFIs. | 277 (76.9) | 51 (14.2) | 32 (8.9) |

**Qualitative Analysis**

**Table 4: Code System**

| Code System Themes | Subthemes | Frequency 208 |
|---|---|---|
| Knowledge and Perceptions of ARI | Types and Awareness | 11 |
| | Sources of Information | 2 |
| | Causes and understanding | 19 |
| | Severity Perception | 8 |
| Barriers and Facilitators in Reporting, Management, and Response | Reporting Experiences | 13 |
| | Management Practices | 16 |
| | Barriers and waiting time | 10 |
| | Support Systems | 14 |
| | Impact on Future Actions | 11 |
| Experiences Towards Childhood Immunisation | Emotional Impact | 6 |
| | Specific Experiences | 6 |
| | Trust in Vaccination | 4 |
| | Positive Motivations | 5 |
| Factors Contributing to Vaccine Hesitancy or Acceptance | Hesitancy Drivers | 16 |
| | Acceptance Factors | 10 |
| | Community and Social Influences | 11 |
| | Lifestyle Factors | 5 |
| | Follow up for hesitancy | 2 |
| Communication Strategies and Information Exchange | Information Delivery | 10 |
| | Effectiveness of Interaction | 14 |
| | Preferred Methods of Receiving Information | 5 |
| | Trust-Building | 5 |
| | Recommendation | 5 |

**Discussion**

**Knowledge and Perception:** Quantitative results revealed that most caregivers in Ilorin Metropolis demonstrated strong knowledge of AEFIs, with over 70% identifying common mild reactions such as soreness, fever, and tiredness as

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normal and non-harmful. Overall, 78.9% had adequate knowledge, a finding supported by FGDs and KIIs where caregivers described typical symptoms like "swelling and redness" or "temperature increase." Healthcare workers also distinguished between minor and severe reactions based on their clinical training.

This high knowledge level aligns with studies from Saudi Arabia, Thailand, and Palestine showing recognition of mild AEFIs but contrasts with lower awareness in Enugu (42.6%) and Ghana, likely due to Ilorin's higher education levels and structured PHC training. The Ilorin results (78.9%) surpass the 47% knowledge level in Saudi Arabia (Alnumair & Almulifi, 2022), emphasizing the positive impact of urban access to information and HCW education.

**Reporting and Management Practices:** Most caregivers (95.3%) found AEFI reporting easy, and 91.7% believed it enhances vaccine safety. About 87% confidently managed mild symptoms using rest or medication. However, 25.3% noted access barriers like long waiting times and clinic distance. FGDs and KIIs echoed these findings—caregivers reported tepid sponging and paracetamol use, while HCWs cited challenges such as self-funded transport for report submission. Despite these, pre-vaccination talks, family support, and positive healthcare experiences fostered active reporting.

Compared internationally, Ilorin's reporting ease exceeded Uganda (35.7%) and China (38.2%) but shared logistical barriers like workload and form availability. Digital solutions proposed by Ilorin HCWs mirrored Zimbabwe's SMS-based surveillance success. Ilorin's low fear of blame (14.7%) also contrasted with stigma-driven underreporting in Thailand, suggesting urban trust enhances participation.

**Experience of AEFI:** About one-third (34.7%) of caregivers reported post-vaccination side effects—mainly warmth (62.4%) and pain (50.4%)—but 83.9% viewed them as mild and temporary. Most (73.6%) used home remedies or medication, while 21.9% sought medical care for severe reactions. FGDs reflected emotional responses ranging from fear to relief, with caregivers maintaining trust in immunization benefits.

These findings are consistent with global studies showing fever and soreness as common AEFIs (Alnumair & Almulifi, 2022; Bhatta & Moles, 2022; Olson *et al*., 2020) and similar management patterns (Watyaba *et al*., 2025).

The findings of this study revealed a high level of awareness and appropriate management of Adverse Events Following Immunization (AEFIs) among caregivers and healthcare workers (HCWs) in Ilorin Metropolis. Most caregivers demonstrated adequate knowledge of common mild reactions such as soreness, fever, and swelling, with 73.6% showing confidence in managing these symptoms through rest, medication, or supportive care. This pattern mirrors the findings of Ogundele et al. (2023) in Ile-Ife, where mothers effectively managed mild AEFIs, though a higher proportion (67.5%) attributed them to pentavalent vaccines, suggesting contextual differences in perception. Similarly, qualitative insights from Ilorin's KIIs and FGDs—such as reports of "a child crying excessively with swelling"—reinforced that caregivers recognize and normalize transient post-vaccination reactions.

Comparative studies across sub-Saharan Africa and Asia reinforce these results. In Uganda, Watyaba *et al*. (2025) documented severe AEFIs (2.2 per million convulsions) requiring clinical care, a rate comparable to Ilorin's 21.9% clinic visits for more serious reactions. However, Ugandan caregivers reported greater distress, contrasting with Ilorin's urban relief, attributed to stronger PHC communication and guidance. In Ghana, Ansah et al. (2025) also identified fear of discomfort overshadowing vaccine benefits, yet, as in Ilorin, caregivers expressed continued trust due to perceived immunization advantages. Broader regional evidence from Bangura et al. (2020) indicated that socioeconomic differences shape perceptions of vaccine reactions, with Ilorin's largely self-employed urban caregivers (65.6%) exhibiting higher acceptance, further encouraged by PHC incentives and supportive environments. These alignments confirm that while mild AEFIs are universally recognized, urban support systems and PHC communication play critical roles in tempering emotional burdens and sustaining vaccine confidence.

Despite high knowledge, the experiences of AEFIs influenced behavioral outcomes. About 59.2% of caregivers admitted that adverse reactions affected their decisions, and 58.1% became more hesitant following frequent reports. However, 90% regained confidence through positive interactions and clear communication with HCWs, while 43.3% indicated that dismissive responses reduced their likelihood of future reporting. The qualitative narratives illuminated underlying factors such as fear ("I get discouraged a lot due to the discomfort"), misinformation, and cultural beliefs, particularly among Hausa/Fulani caregivers. Yet, these were often countered by education and follow-up support from HCWs ("we inform the parents on the benefits… which encourages them to come back"). These patterns are consistent with Gopalan et al. (2025) in India, where fever-related reactions delayed vaccination in 30% of cases, and Olson *et al*. (2020) in the U.S., who found empathetic communication increased confidence by

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24%. Likewise, Etim *et al*. (2025) and Olaniyan *et al*. (2022) highlighted the role of trust and home visits in mitigating misinformation-driven hesitancy—an approach also evident in Ilorin's urban PHCs.

The results further underscore the central role of healthcare worker communication in sustaining vaccine confidence. A majority (90.6%) of caregivers in Ilorin affirmed that HCWs provided clear and understandable explanations of possible AEFI reactions; 84.2% acknowledged proactive prevention discussions, and 86.1% felt that their concerns were handled respectfully. Moreover, 76.9% reported receiving educational materials, such as pamphlets or calendars, and valued demonstrations and visual aids during immunization sessions. These findings are comparable to those of Marhánková *et al*. (2024) in the Czech Republic, where visual materials improved comprehension (88.6%), and Olson *et al*. (2020), who reported improved understanding through narrative storytelling (75%). Similarly, Watyaba *et al*. (2025) in Uganda found that clinic guidance prevented 56.6% of mismanagement cases, while Lv *et al*. (2022) in China identified training gaps that limited caregiver understanding.

Consistent with Ortiz *et al*. (2017) and Olaniyan *et al*. (2022), the Ilorin findings affirm that dialogue, empathy, and multi-channel education remain effective strategies for strengthening vaccine communication. Unlike Thailand's hill-tribe caregivers, where language barriers obstructed communication in 70% of cases (Moonpanane et al., 2023), Ilorin's use of Yoruba translations enhanced accessibility and comprehension. Moreover, sub-Saharan reviews such as Bangura et al. (2020) emphasize that culturally tailored health messages are essential for equity, situating Ilorin's success as an adaptable model for other urban and semi-urban contexts.

Transparent, compassionate communication that prioritizes responsiveness and reassurance regularly boosts vaccine trust (Marhánková *et al*., 2024; Kaufman *et al*., 2024). Thus, training HCWs as vaccine communicators is crucial. Policy implications include digitalizing AEFI reporting, continuous supervision, and integrating culturally sensitive education into national immunization programs.

Sustaining vaccine confidence, therefore, requires an integrated framework that links surveillance, education, and interpersonal engagement.

## Conclusion

This study examined adverse events following immunization (AEFI) among caregivers and healthcare workers in selected primary health centres in Ilorin Metropolis, revealing high awareness, positive perceptions, and strong confidence in vaccine safety. Caregivers demonstrated adequate knowledge of common mild reactions such as soreness, redness, fever, and tiredness, recognizing these as normal immune responses rather than signs of harm. Both caregivers and healthcare workers appropriately differentiated between mild and severe AEFI, reflecting shared understanding informed by experience and clinical training. This alignment between perceived benefits and manageable risks reinforces public trust in routine immunization.

Although challenges such as clinic distance and waiting time were reported, most caregivers found AEFI reporting straightforward, aided by pre-vaccination guidance and accessible healthcare workers. Management practices—particularly tepid sponging and paracetamol use—demonstrated confidence in handling minor reactions. Emotional responses such as initial fear was commonly replaced by reassurance after symptom resolution, showing resilience and continued adherence to immunization schedules.

Vaccine hesitancy, though present among some caregivers, was largely mitigated by positive interactions with healthcare workers. Empathetic communication, proactive education, and the provision of informational materials strengthened caregiver confidence and trust. These findings highlight the critical role of interpersonal engagement and clear communication in addressing misinformation, cultural beliefs, and fear of side effects, thereby sustaining vaccine uptake.

This study contributes to the growing body of evidence on AEFIs in sub-Saharan Africa by emphasizing the value of urban primary healthcare systems, training, and structured communication in promoting effective surveillance and management. The Ilorin experience demonstrates that informed perceptions and responsive health systems can sustain high immunization confidence, even within resource-limited contexts.

In summary, AEFIs should not be viewed as barriers but as manageable and expected outcomes within the vaccination process. Strengthening caregiver knowledge, enhancing healthcare worker communication, and addressing logistical challenges will further improve vaccine safety surveillance and acceptance, advancing equitable and resilient immunization programs across Nigeria and similar s

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