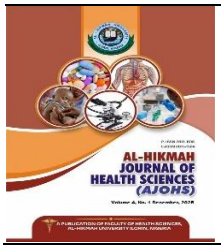
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Original Article

Determinants of Vaccine Hesitancy Among Caregivers of Under-Five Children in Ilorin West Local Government Area, Kwara State, Nigeria

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ABSTRACT

Background: Vaccine hesitancy can contribute to delayed or refused childhood vaccination. This study assessed caregivers' knowledge, perceptions, health-system factors, and vaccine hesitancy among caregivers of under-five children in Ilorin West Local Government Area, Kwara State, Nigeria.

Methods: A descriptive cross-sectional study was conducted among 424 caregivers selected through four-stage multistage sampling. Data were collected using a structured interviewer-administered questionnaire and analyzed using IBM SPSS Statistics version 27. Descriptive statistics, bivariate chi-square test, and multivariable binary logistic regression were performed at a 5% significance level.

Results: Of 424 caregivers, 359 (84.7%) had good vaccination knowledge, 349 (82.3%) had positive perceptions, and 338 (79.7%) reported good health-system support. Overall, 73 (17.2%) were vaccine hesitant and 351 (82.8%) were not. Delayed vaccination was reported by 81 (19.1%), while 32 (7.5%) had refused a recommended vaccine. Age (χ^2=9.842, p=0.020), education (χ^2=13.527, p=0.004), and knowledge (χ^2=34.287, p<0.001) were significantly associated with hesitancy.

Conclusion: Vaccine hesitancy affected 17.2% of caregivers. Strengthening vaccine education, addressing side-effect concerns, and improving reminder systems may support timely childhood immunization.

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Introduction

Vaccination is one of the most effective and cost-efficient public health interventions for preventing infectious diseases and reducing childhood morbidity and mortality worldwide. Childhood vaccination stands as one of the most effective public health interventions, having dramatically reduced mortality from vaccines-preventable diseases world-wide (World Health Organization [WHO], 2024). Despite these achievements, millions of children in low- and middle-income countries continue to miss life-saving vaccines because of demand- and supply-side barriers, one of the most important being vaccine hesitancy, the delay in acceptance or refusal of vaccination despite the availability of vaccination services (MacDonald & SAGE Working Group on Vaccine Hesitancy, 2015). Approximately 14.5 million children were classified as "zero-dose" globally in 2023, and Nigeria remains among the countries contributing the highest number of such children, reflecting persistent inequities in immunization access and acceptance (WHO & UNICEF, 2024).

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Recent Nigerian studies show that caregiver knowledge, attitudes, and perceptions substantially influence vaccination decisions (Emmanuel *et al.,* 2024), and that fear of side effects, low confidence in vaccine effectiveness, large family size, and reliance on non-healthcare information sources predict hesitancy (Sulaiman *et al.,* 2023). Health-system characteristics, accessibility, distance, vaccine availability, waiting time, and provider–client interaction, also shape caregivers' vaccination decisions (Mohammed *et al.,* 2024).

Ilorin West Local Government Area (LGA), one of the most densely populated urban LGAs in Kwara State, serves a socio-culturally diverse population whose varying educational, religious, and economic backgrounds may influence vaccine acceptance. Although routine childhood immunization has been examined elsewhere in Kwara State, including caregiver knowledge and vaccination status in Ilorin East (Ariyibi *et al.,* 2023) and adult COVID-19 vaccine acceptance in Ilorin (Ogunbosi *et al.,* 2022), no prior study has specifically measured the prevalence and determinants of routine childhood vaccine hesitancy among caregivers of under-five children in Ilorin West LGA using a dedicated hesitancy measure. This study addresses that gap by assessing caregivers' knowledge and perceptions of childhood vaccination, the prevalence of vaccine hesitancy, and health system-related factors influencing hesitancy in this population.

The corresponding null hypothesis tested was that there is no significant association between caregivers' knowledge of childhood vaccination and vaccine hesitancy.

Materials and Methods

Study design and setting

A descriptive cross-sectional study was conducted among caregivers of under-five children in Ilorin West Local Government Area, Kwara State, Nigeria. Ilorin West contains 12 political wards and comprises diverse residential, commercial and institutional communities.

Study population and eligibility

The study population comprised caregivers (mothers, fathers, or other primary guardians) of children aged 0–59 months resident in Ilorin West LGA for at least six months, who consented voluntarily to participate. Caregivers who were non-resident, severely ill, or unable to give informed consent were excluded.

Sample size and sampling

The minimum sample size was estimated using Fisher's formula for a single population proportion, $n = Z^2pq/d^2$, using Z=1.96, p=0.50, q=0.50 and d=0.05, giving 384. Allowing 10% for non-response produced a planned minimum of 427 caregivers. A total of 424 complete questionnaires were available for analysis. A four-stage multistage sampling procedure was used. Ilorin West LGA was purposively selected. Six of its 12 political wards were selected by simple random sampling, followed by selection of two enumeration areas/clusters within each selected ward, giving 12 clusters. Within each selected cluster, eligible households were identified and used as the sampling frame. The sampling interval (K) was calculated as the estimated number of eligible households in the cluster divided by the number of caregivers required from that cluster. A random starting household was selected and every Kth eligible household was approached until the allocated sample was reached

Data collection and instrument

Data were collected using a structured, interviewer-administered questionnaire adapted from previously validated instruments used in comparable Nigerian and African studies, the WHO SAGE vaccine hesitancy determinants framework, and the internationally validated Parent Attitudes about Childhood Vaccines (PACV) survey (Opel *et al.,* 2011). The questionnaire comprised sections covering socio-demographic characteristics, vaccination knowledge, caregiver perceptions, health-system factors, and vaccine hesitancy. Content and face validity were established through expert review and forward–backward translation into Yoruba. Reliability was assessed through a pre-test among 42 caregivers in neighboring Ilorin South LGA., with sub-scale Cronbach's alpha values of ≥0.70 considered acceptable.

Data collection procedure

Trained research assistants, comprising final-year public health students and community health extension workers, administered the questionnaire face-to-face in English or Yoruba and other languages where applicable, according to respondent preference, over an eight-week period on scheduled immunization/child welfare clinic days and at their respective houses.

Validity, reliability and analysis

Content and face validity were established through expert review, and the questionnaire was pre-tested among 42 caregivers in a neighboring LGA not included in the main study. Data were coded and analyzed using IBM SPSS Statistics version 27. Frequencies, percentages, means and standard deviations were used for descriptive analysis. Pearson's chi-square test assessed bivariate associations. A binary logistic regression model was fitted with higher vaccine hesitancy as the outcome and age group, sex, marital status, religion,

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educational level, occupation, knowledge score, perception score and health-system support score as predictors. Adjusted odds ratios (aORs), 95% confidence intervals (CIs) and p-values were reported. Statistical significance was set at $p<0.05$. The final analytical dataset contained 424 observations.

Ethical considerations

Ethical approval for the study was obtained from the Kwara State Ministry of Health Research Ethics Committee (Approval No. ERC/MOH/2025/06/704, dated 15th June, 2026), with additional permission obtained from the Ilorin West LGA Health Department. The study was conducted in accordance with the principles of the Declaration of Helsinki (World Medical Association, 2013). Written or verbal informed consent was obtained from all participants before participation. Participation was voluntary, and participants were informed of their right to decline or withdraw from the study at any time without penalty. Confidentiality and anonymity of participants were maintained throughout the study.

Results

Socio-demographic characteristics

Respondents had a mean age of 31.0 ± 5.1 years, with most (71.9%) aged 25–34 years. The majority were female (86.1%), married (87.3%), Muslim (89.9%), and of Yoruba ethnicity (95.0%). Most had secondary (61.1%) or tertiary (24.3%) education, and nearly half (47.2%) were traders (Table 1).

Table 1: Socio-demographic characteristics of caregivers (N=424).

Variable	Category	n	%
Age group (years)	18–24	31	7.3
	25–34	305	71.9
	35–44	83	19.6
	≥45	5	1.2
Sex	Male	59	13.9
	Female	365	86.1
Marital status	Single	24	5.7
	Married	370	87.3
	Divorced/Separated	19	4.5
	Widowed	11	2.6
Religion	Christianity	37	8.7
	Islam	381	89.9
	Traditional	6	1.4
Ethnicity	Yoruba	403	95
	Hausa	20	4.7
	Igbo	1	0.2
Educational level	No formal education	20	4.7
	Primary	42	9.9
	Secondary	259	61.1
	Tertiary	103	24.3
Occupation	Civil servant	48	11.3
	Trader	200	47.2
	Artisan	143	33.7
	Farmer	9	2.1
	Unemployed	24	5.7

Summary of knowledge, perception and health-system indicators.

Overall, 84.7% of caregivers had good vaccination knowledge, 82.3% had positive perceptions, and 79.7% reported good health-system support. Concerns about vaccine side effects were reported by 48.1%, while only 54.2% received vaccination reminders (Table 2).

Table 2: Summary of knowledge, perception and health-system indicators.

Domain/indicator	n	%
Good knowledge	359	84.70%
Positive perception	349	82.30%

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Good health-system support	338	79.70%
Heard about routine immunization	411	96.90%
Vaccines protect against serious diseases	399	94.10%
Know next vaccination date	356	84.00%
Concern about possible vaccine side effects	204	48.10%
Vaccines usually available at facility	350	82.60%
Health workers treat caregivers respectfully	354	83.50%
Facility easy to access	348	82.10%
Receive vaccination reminders	230	54.20%
Clinic health education increases confidence	351	82.80%

Prevalence of vaccine hesitancy

Overall, 81 (19.1%) caregivers reported ever delaying their child's vaccination and 32 (7.5%) had refused a recommended vaccine. Most were willing to accept a newly introduced vaccine (79.2%). Overall, 73 (17.2%) were classified as vaccine hesitant, while 351 (82.8%) were not hesitant (Table 3).

Table 3: Vaccine hesitancy among caregivers of under-five children (N = 424)

Indicator	**n**	**%**
Ever delayed child's vaccination - Yes	81	19.1
Ever refused a recommended vaccine - Yes	32	7.5
Would accept a newly introduced vaccine - Yes	336	79.2
Would accept a newly introduced vaccine - Not sure	60	14.2
Very willing to follow immunization schedule	221	52.1
Willing to follow immunization schedule	141	33.3
Overall hesitancy classification - Not hesitant	351	82.8
Overall hesitancy classification - Hesitant	73	17.2

Bivariate associations with vaccine hesitancy

Age (χ^2=9.842, p=0.020), educational level (χ^2=13.527, p=0.004), and knowledge level (χ^2=34.287, p<0.001) were significantly associated with vaccine hesitancy. Sex, marital status, religion and occupation were not significantly associated with hesitancy (Table 4).

Table 4: Bivariate associations with vaccine hesitancy. *p < 0.05.

Variable	**χ^2**	**p-value**
Age group	9.842	0.020*
Sex	0.624	0.43
Marital status	2.431	0.488
Religion	0.512	0.774
Educational level	13.527	0.004*
Occupation	8.916	0.063
Knowledge level	34.287	<0.001*

Selected multivariable logistic regression results for higher vaccine hesitancy.

Multivariable logistic regression identified factors independently associated with higher vaccine hesitancy. The model was statistically significant (likelihood-ratio χ^2=111.312, df=19, p<0.001; McFadden pseudo-R^2=0.190). Higher health-system support was associated with greater odds of hesitancy (aOR=1.33, 95% CI: 1.23–1.47, p<0.001). Caregivers aged 35–44 years had higher odds than those aged 25–34 years (aOR=1.85, 95% CI: 1.03–3.33, p=0.040), while single caregivers had lower odds than married caregivers (aOR=0.25, 95% CI: 0.08–0.75, p=0.014). Christian caregivers had lower odds than Muslim caregivers (aOR=0.28, 95% CI: 0.10–0.75, p=0.011), whereas civil servants had higher odds than traders (aOR=2.44, 95% CI: 1.01–5.88, p=0.047). Knowledge and perception scores were not independently associated with hesitancy.

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Table 5: Selected multivariable logistic regression results for higher vaccine hesitancy.

Predictor	aOR	95% CI	p-value
Age 35–44 vs. 25–34 years	1.85	1.03–3.33	0.040*
Single vs. married	0.25	0.08–0.75	0.014*
Christianity vs. Islam	0.28	0.10–0.75	0.011*
Civil servant vs. trader	2.44	1.01–5.88	0.047*
Knowledge score	1.15	0.85–1.54	0.352
Perception score	0.96	0.90–1.02	0.21
Health-system support score	1.33	1.23–1.47	<0.001*

Reference groups: age 25–34 years, married, Islam and trader. *p<0.05. The full model also included sex and the remaining marital-status, religion, education and occupation categories.

Discussion

This study found that 84.7% of caregivers in Ilorin West LGA had good knowledge of childhood vaccination, consistent with recent Nigerian studies reporting good knowledge among 76.0%–89.9% of caregivers (Ariyibi *et al.,* 2023; Adedire *et al.,* 2021). Nearly all respondents had heard of routine immunization, echoing the 98.0% awareness reported by Ariyibi *et al.* (2023), reflecting sustained investment in maternal and child health education through primary healthcare services. Nonetheless, knowledge gaps persisted regarding vaccine safety testing, which may sustain uncertainty and susceptibility to misinformation. Healthcare workers were the most trusted source of vaccination information, consistent with prior findings. However, nearly half of caregivers expressed concern about vaccine side effects, a concern also identified as the leading driver of hesitancy toward the RTS,S malaria vaccine nationally (Sulaiman *et al.,* 2023), suggesting that safety communication remains an area requiring reinforcement even where overall perceptions are favorable.

Most caregivers (79.7%) reported good health system support, including satisfactory vaccine availability, respectful treatment, and accessible facilities, a more favourable picture than reported in some other Nigerian settings, where vaccine shortages, staff shortages, and transport difficulties were prominent barriers (Akwataghibe *et al.,* 2019). Reminder systems were, however, the weakest component of health-system support, with only about half of caregivers receiving appointment reminders, a gap that, if addressed through mobile-phone or community-health-worker-based recall systems, could further reduce missed and delayed vaccinations. The overall prevalence of vaccine hesitancy in this study (17.2%) was considerably lower than hesitancy estimates reported for newer or less familiar vaccines in Nigeria, including 29.9% for the RTS, S malaria vaccine (Sulaiman *et al.,* 2023), 68.5% for the COVID-19 vaccine (Ogunbosi *et al.,* 2022).

Caregiver age and educational level were significantly associated with vaccine hesitancy, consistent with previous Nigerian evidence linking older caregiver age and higher educational attainment with more favorable vaccination knowledge and attitudes (Ariyibi *et al.,* 2023). Sex, marital status, religion, and occupation were not significantly associated with hesitancy, differing from findings of significant religious variation reported elsewhere in Nigeria (Sulaiman et al., 2023). Knowledge of childhood vaccination showed the strongest association with hesitancy in this study, with caregivers demonstrating poor knowledge more than three times as likely to be vaccine hesitant as those with good knowledge. This finding aligns with Ariyibi *et al.* (2023), who reported a significant relationship between caregiver knowledge and full vaccination status, reinforcing knowledge as a key modifiable determinant of caregiver confidence in vaccination.

Conclusion

Vaccine hesitancy among caregivers of under-five children in Ilorin West LGA was 17.2%, against generally good vaccination knowledge, positive perceptions, and good health-system support. Age, educational level, and knowledge were significantly associated with hesitancy, while multivariable analysis identified health-system support, age, marital status, religion, and occupation as independent correlates.

Recommendations

Health authorities should strengthen community-based vaccination education, particularly for younger and less-educated caregivers, and address concerns about vaccine side effects. Health facilities should provide consistent vaccine-safety counselling and strengthen reminder/recall systems through SMS, telephone calls, or community health workers. Community and religious leaders should also be engaged to promote accurate vaccination information and counter misinformation.

References

Adedire, E. B., Ajumobi, O., Bolu, O., Nguku, P., & Ajayi, I. (2021). Maternal knowledge,

P-ISSN: 2811-1516
E-ISSN: 2811-1524

attitude, and perception about childhood routine immunization program in Atakumosa-West Local Government Area, Osun State, Southwestern Nigeria. Pan African Medical Journal, 40(Suppl. 1), 8. https://doi.org/10.11604/pamj.supp.2021.40.1.30876

Akwataghibe, N. N., Ogunsola, E. A., Broerse, J. E. W., Popoola, O. A., Agbo, A. I., & Dieleman, M. A. (2019). Exploring factors influencing immunization utilization in Nigeria: A mixed methods study. Frontiers in Public Health, 7, 392. https://doi.org/10.3389/fpubh.2019.00392

Ariyibi, S. O., Ojuawo, A. I., Ibraheem, R. M., Afolayan, F. M., & Ibrahim, O. R. (2023). Mothers/caregivers' knowledge of routine childhood immunization and vaccination status in children aged 12–23 months in Ilorin, Nigeria. African Health Sciences, 23(4), 582–591. https://doi.org/10.4314/ahs.v23i4.61

MacDonald, N. E., & SAGE Working Group on Vaccine hesitancy. (2015). Vaccine hesitancy: Definition, scope and determinants. Vaccine, 33(34), 4161–4164. https://doi.org/10.1016/j.vaccine.2015.04.036

Mohammed, Y., Reynolds, H. W., Waziri, H., Attahiru, A., Olowo-Okere, A., Kamateeka, M., Waziri, N. E., Garba, A. M., Corrêa, G. C., Garba, R., Vollmer, N., & Nguku, P. (2024). Exploring the landscape of routine immunization in Nigeria: A scoping review of barriers and facilitators. Vaccine: X, 20, 100563. https://doi.org/10.1016/j.jvacx.2024.100563

Ogunbosi, B. O., Alao, M. A., Ibrahim, O. R., Ayuk, A. C., Ibraheem, R. M., Odimegwu, C. L., Ikwuka, D. C., Akintan, P., Morakinyo, O., Adeyemi, A. T., Jega, R. M., Olowookere, T. F., Bello, O. E., Owolabi, B. I., Chukwuyem, A., Bukar, L. M., Rasaki, A., Issa, A., Ewa, A. U., Oladokun, R., & Akinyinka, O. O. (2022). COVID-19 vaccine hesitancy in six geopolitical zones in Nigeria: A cross-sectional survey. Pan African Medical Journal, 42, 179. https://doi.org/10.11604/pamj.2022.42.179

Opel, D. J., Mangione-Smith, R., Taylor, J. A., Korfiatis, C., Wiese, C., Catz, S., & Martin, D. P. (2011). Development of a survey to identify vaccine-hesitant parents: The Parent Attitudes about Childhood Vaccines (PACV) survey. Human Vaccines, 7(4), 419–425. https://doi.org/10.4161/hv.7.4.14120

Sulaiman, S. K., Tsiga-Ahmed, F. I., Musa, M. S., Sulaiman, A. K., Dayyab, F. M., Khan, M. A., Ahmad, S. I., Akpan, U. A.-O., Usman, U. I., & Bako, A. T. (2023). Prevalence, determinants, and reasons for malaria vaccine hesitancy among caregivers of under-five children in Nigeria: Results from a nationwide cross-sectional survey. Vaccine, 41(8), 1503–1512. https://doi.org/10.1016/j.vaccine.2023.01.060

World Medical Association. (2013). World Medical Association Declaration of Helsinki: Ethical principles for medical research involving human subjects. JAMA, 310(20), 2191–2194. https://doi.org/10.1001/jama.2013.281053

World Health Organization, & UNICEF. (2024). WHO and UNICEF estimates of national immunization coverage (WUENIC), 2023. World Health Organization. https://www.who.int/publications/m/item/who-unicef-estimates-of-national-immunization-coverage