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Research Article

Quality of Counselling, Exposure to Vaccination Messages, and Caregivers' Knowledge on the Uptake of Pentavalent Vaccine in Six Northern Nigerian States

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Background. Pentavalent (Penta) vaccine coverage for children aged 12–23 months is used as the prime substitute for determining vaccination coverage and monitoring the performance of the national immunization program. However, the coverage for Penta vaccine in Nigeria remains low. Quality interaction between caregivers and providers and access to appropriate information are associated with healthcare utilization and acceptance of recommended health behaviours. This study examines the quality of counselling (QOC), caregivers' exposure to vaccination messages, and child's uptake of the Penta vaccine. *Methods*. This was a cross-sectional study that utilized quantitative data obtained through a survey. Caregivers ($n = 561$) of children aged 2–24 months accessing child vaccination services who received Penta vaccines at randomly selected health facilities ($n = 163$) offering routine immunization (RI) services were surveyed. Penta uptake was coded as binary; hence, binary logistic regression was performed using Stata 14. *Result*. We found that 56% of the caregivers received quality counselling. Although awareness of child vaccination was high (70%), two-thirds had limited exposure through health communication channels. The uptake of all three doses of Penta vaccine was 43% among eligble children. Factors associated with Penta uptake include caregivers' knowledge of when a child should receive their first vaccination (aOR = 2.08 and 95% CI = 1.01–4.29), sources of child vaccination messages, namely, place of worship (aOR = 2.78 and 95% CI = 1.15–6.67), community health workers (CHWs; aOR = 1.95 and 95% CI = 1.14–3.34), community leader (aOR = 2.21 and 95% CI = 1.11–4.41), and residence in the northwest region (aOR = 2.60 and 95% CI = 1.51–4.48). *Conclusion*. Given the low quality of counselling and the positive influence of religious and traditional leaders, interventions that prioritize strengthening patient–provider interaction and community structure are crucial for increasing child vaccination coverage in Nigeria.

1. Background

Childhood immunization during the first few months of life seeks to build immunity and is needed for protection against infectious diseases during infancy [1]. The routine child immunization schedule recommends that a child receive a specific vaccine at a particular age. According to the World Health Organization (WHO), the childhood vaccination program aims to ensure that children receive appropriate doses of vaccine at a particular age without delay [2]. While full-child vaccination coverage is considered a better indicator for measuring the complete benefits of childhood immunization [3], Pentavalent (Penta) coverage for children aged 12–23 months has been frequently used as the prime substitute for determining vaccination coverage and monitoring the performance of national immunization programmes [4].

In Nigeria, the coverage for the Penta vaccine and all the recommended doses of routine immunization has remained low, far below the targets set by WHO in the 2012 Global Vaccine Action Plan for ensuring universal access to immunization [5, 6]. This is important as donors often consider the coverage for Penta and measles vaccines because they constitute indicators of health system performance [7, 8], and because of the inclusion of Penta in the original expanded program on immunization (EPI) due to its multidose nature [9]. The Pentavalent vaccine combines five

vaccines in one, administered to protect against life-threatening diseases—diphtheria, tetanus, whooping cough, hepatitis B, and haemophilus influenza type B, all contained in a single dose [1]. However, in 2019, Nigeria had the highest number of infants unvaccinated with the Penta vaccine through routine immunization services [10]. Additionally, while the global coverage for Penta was estimated at 81% in 2021 [11], the coverage for Penta in Nigeria as of 2021 remained very low at 56%, when compared to that of neighbouring countries such as Ghana (98%), Senegal (85%), and Niger (82%) [12]. Data from Nigeria suggest regional differences in Penta coverage, with rates as low as 19% in the northeast and 52% in the southwest [13], relative to the higher coverage reported in other regions of the country.

Studies [14, 15, 16, 17, 18, 19, 20, 21] have identified the influence of individual (age, level of education, and place of residence), health-seeking behaviour factors (antenatal care attendance, postnatal care attendance, and facility delivery), and community-level factors such as distance to a health facility and the role of traditional and institutional structure on routine child immunization uptake in Nigeria [16, 18, 22, 23]. These studies reported significant effects of maternal characteristics and health-seeking behaviour factors. Also, they acknowledged the important role of traditional and religious institutions in disseminating key health information, including routine child immunization uptake, due to their strong influence on their subjects. Disseminating immunization messages using coordinated community structures that convey targeted information via different channels, including town criers and the use of short messaging services (SMS), was evidence of strong and effective communication strategies, in addition to being culturally acceptable.

However, research into the importance of service delivery factors, such as provider–client interaction, and how they affect caregivers' knowledge and exposure to information on Penta vaccination uptake has yet to receive sufficient attention in Nigeria. Previous studies [22, 24, 25] have shown that good interaction between the client and provider of care influences healthcare utilization, and affects decision-making and acceptance of recommended health behaviour. Additionally, in terms of the impact of knowledge on child vaccination uptake, communities where vaccination enjoys a high level of acceptance and is made a social norm have been associated with increased vaccination uptake [26, 27, 28, 29, 30]. Furthermore, exposure and adequate access to information can certainly enhance knowledge. For instance, a household survey in Sierra Leone found exposure to multiple sources of information about child vaccination was positively associated with child vaccination uptake. Specifically, exposure to information about child vaccination from religious leaders, health facilities, and community health workers (CHWs) was positively associated with child vaccination uptake [23, 31, 32]. In general, studies [29, 33, 34, 35, 36] have explored the interaction between patient–provider interaction, caregivers' exposure to child vaccination messages, knowledge about child vaccination, and vaccination uptake. However, there are limited studies in Nigeria and the northern region in particular that have explored caregivers' first-hand experiences on the quality of counselling services received from providers regarding childhood vaccination and its implication for knowledge and vaccination uptake. Moreover, the coverage information was largely obtained from the child's health card, thereby reducing the amount of possible recall errors from caregivers. Hence, this study examined the influence of quality counselling, caregivers' exposure to vaccination messages, and the uptake of Penta vaccine among caregivers of under-five children in northern Nigeria. The choice of northern Nigeria is because it has the lowest coverage of all vaccination coverage including Penta vaccine relative to their southern counterpart.

2. Materials and Methods

2.1. Study Settings, Population, and Design. The study was conducted in six northern Nigeria states located in the northwest (Kano, Kaduna, and Sokoto) and northeast (Bauchi, Borno, and Yobe) states (Figure 1). These regions have the poorest health indices in the country including low child vaccination coverage and high childhood mortality [2]. The study population was caregivers aged 15–49 years presenting their child for routine immunization at the health facilities in the study area. We adopted a cross-sectional survey design to collect quantitative data from caregivers of children aged 2–24 months.

2.2. Sampling and Size. We used a two-stage stratified sampling procedure in selecting primary healthcare centers (PHCs). In the first stage, the states had three senatorial districts each. To ensure coverage and spread, 50% of the total number of the local government areas (LGAs) spread across the three senatorial districts in each state were selected proportionately (with the exception of Borno, where fewer LGAs were covered due to insecurity). For example, in a state with 20 LGAs half or 10 LGAs were randomly selected. In addition, two PHCs were randomly selected in each LGA, resulting in 20 health facilities sampled for that state. The same procedure was applied to other states, except Borno.

A total of 1,077 client exit interviews (CEIs) with caregivers accessing child vaccination services across all six states were conducted. However, for the findings presented in this study, the analysis was performed on 561 children aged 2–24 months who had received the Penta vaccine. The choice of Penta vaccine was because of its low coverage relative to other vaccines taken, while the age range 2–24 months was chosen because, at that age, the child is expected to have taken at least the first dose of Penta vaccine according to the national immunization schedule shown in Table 1. Additionally, the majority of the children were in the younger age group (<6 months of age). Hence, the final sample size for this study is 561 caregivers of children aged 2–24 months who have been vaccinated with at least one dose of the Penta vaccine. According to the National Immunization schedule in Nigeria, Penta-1, 2, and 3 are expected to be taken at weeks 6, 10, and 14, respectively, at a dose of 0.05 ml administered at the left outer thigh of the child [37].

2.3. Inclusion Criteria and Sample Size. To be eligible for selection, caregivers must be aged 15–49 years with a child aged 2–24 months accessing child vaccination at the health facility at the time of the survey and willing to provide

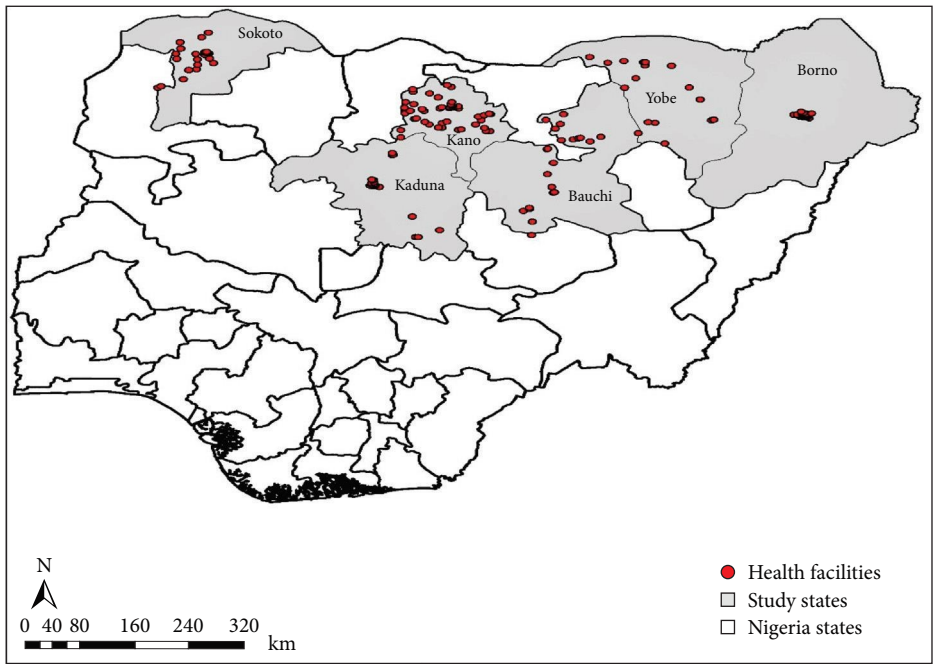

Figure 1: Map of Nigeria showing the study state.

Table 1: Explanatory variables.

Variable	Coding	Description
Caregivers age	15–24 years (1), 25–34 years (2), and 35–49 years (3)	Caregivers' age was collected as at the last birthday but categorized into three groups
Level of education	No formal education (1), primary education (2), secondary education (3), and tertiary education (4)	Highest level of education attained
Occupation	Housewife (1), self-employed (2), teaching profession (3), student (4), and others comprising of civil servants and any other occupation category not captured (5)	Current occupation of the caregivers
Primary decision maker on child vaccination	Father (1), mother (2), and joint decision (3)	The primary decision maker on routine child vaccination
Child's sex	Male (1) or female (2)	Whether the child is male or female
Child's age	Integer recoded into 2–11 months (1) and 12–24 months (2).	Age as at last birthday

informed consent. Questions about child vaccination were asked with reference to the last child where the caregiver had more than one child. Caregivers were recruited at the point of presenting their child for vaccination because the visit to the health facilities was done on the days of the weekly routine immunization according to the schedule of the different health facilities.

2.4. Data Collection. We conducted a CEI with consenting eligible respondents between 14th March and 8th April 2022. All data gathering activities were held at the PHC facilities. The CEIs were programmed on mobile tablets using the SurveyCTO data collection platform. Several quality control measures were instituted to limit data entry errors and reduce cases of missing data. Additionally, the field team supervisors conducted daily reviews of data entry forms and reported on completeness, accuracy, timeliness, and inconsistencies before the data were finally uploaded on the server. The study tools were translated into Hausa (the predominant language in the study area) for meaning retention. Research assistants and supervisors had copies of the translated tools for possible reference during data collection to ensure that key terms were understood by respondents. The quantitative study tools were adapted from standard facility assessment questionnaires such as the WHO Service Availability and Readiness Assessment (SARA) questionnaire.

2.5. Measures

2.5.1. Outcome and Covariate Variables. The outcome variable is the uptake of any dose of the Penta vaccine, measured using a binary (coded "1" if received, otherwise "0"). The study controlled for some explanatory variables based on previous studies (Table 1).

At the multivariate level, the lowest value associated with a variable was used as the reference category. For instance, for caregiver age, the age group 15–24 years was used as the reference category. For all dichotomous variables, 0 was used as the reference category.

2.5.2. Quality of Counselling (Provider–Client Interaction). Quality of counselling was measured using five indicators: whether the caregiver was told by the provider, what vaccine the child received; the date for the next vaccination appointment; the caregiver received information regarding possible side effects or reactions following the vaccination; the provider informed the caregiver on what to do in the event of a side effect; and whether the provider wrote down the date for the next vaccination appointment. To determine the quality of counselling provided, a composite score of all five indicators was generated. The categories in the good counselling (1) are those who reported yes to all five counselling indicators assessed; otherwise, counselling is considered poor (0).

2.5.3. Caregivers' Knowledge. To determine knowledge, caregivers were asked about when an infant should take the first vaccination dose after birth. Hence, women who reported that a child should receive their first vaccination immediately after birth or within the first week of birth were regarded as having correct knowledge, while those who reported later than 1 week were regarded as having incorrect knowledge.

2.5.4. Awareness and Level of Exposure to Child Vaccination Messages. Awareness was measured by asking if the caregiver had seen or heard of child vaccination in the last 30 days preceding the survey. The level of exposure on the other hand, was measured by the number of channels of information on child vaccination to which a caregiver is exposed. To avoid multicollinearity, only the level of exposure was used at the multivariate level. The level of exposure was determined using 13 different sources, including TV, radio, newspapers, health workers, CHWs, neighbours, community meetings, mother-to-mother support groups (MTMSG), other older children's schools, places of worship, internet/social media, telephone messages, and community leaders. These were used to generate a composite score, while the mean and median values were determined. Thus, women with scores above the median value (in this case, heard messages from at least three different sources) were regarded as having good exposure (coded as 1); otherwise, they were regarded as poor (0).

2.6. Statistical Analysis. First, descriptive statistics of the study variables, namely, frequency, count, and percentage, were performed. Second, in the multivariate model, we performed unadjusted binary logistic regression for each of the explanatory variables with the outcome variable to determine association at the bivariate level. It is important to state that maternal attributes including age, level of education, place of residence and distance to health facility were controlled for in the multivariate model. However, both the unadjusted and adjusted results were not statistically significant ($p > 0.05$) and the results are not shown in Table 2. The associated odds ratio and 95% confidence intervals were reported. Variables with an associated p value <0.05 were considered statistically significant. Analysis of data was performed using Stata 14 software.

2.7. Ethical Approval and Informed Consent. The study was approved by the Population Council Institutional Review Board (Protocol number 992). In Nigeria, the National Health Research Ethics Committee (approval number NHREC/01/01/2007-17/01/2022) and the States' Health and Research Ethics Board also approved the study. Informed consent was obtained from each participant either through signatures or thumb prints for those unable to sign.

3. Result

3.1. Sociodemographic Characteristics of Respondents. Table 3 presents the sociodemographic characteristics of the study participants. The mean age of the caregivers was 27 years (median = 26 years) and ranged from 16 to 45 years. Nearly half (42%) of the women had no formal education. The mean age of the children was 7 months and ranged between 2 and 24 months.

3.2. Pentavalent Vaccine Coverage. The results shown in Figure 2 revealed that the Penta vaccine coverage was low across all age groups. The coverage for Penta was highest at 37% among children aged 12–24 months. Overall, only 43% of children aged 12–24 months received all three doses of the Penta vaccine.

3.3. Quality of Child Vaccination Service, Caregivers' Knowledge, and Exposure to Vaccination Messages. Findings revealed 56% of caregivers received good counselling from the routine immunization (RI) providers (Table 4). Concerning knowledge, a significant proportion (86%) correctly knew when a child should receive their first vaccination, with significant variations across doses. However, less than half (47%) correctly knew that a child should be vaccinated more than five times in their first year of life. Similarly, only 30% had good knowledge (comprising women who correctly mentioned a minimum of two purposes of child vaccination cards out of the three items assessed) of the purpose of vaccination cards.

Regarding exposure to child vaccination messages, 70% have heard or seen messages on child vaccination in the last 30 days preceding the survey. However, only 34% had good exposure, representing caregivers who had seen information on child vaccination from at least three different sources (Table 4). The top three sources of child vaccination are health workers (67%), radio (41%), and CHWs (28%).

3.4. Bivariate Association. At the bivariate level (Table 4), only correct knowledge of when a child should receive the

Table 2: Binary logistic regression showing predictors of Penta vaccine uptake.

Variables	Unadjusted odds ratio			Adjusted odds ratio		
	Odds ratio	95% confidence interval	*p* value	Odds ratio	95% confidence interval	*p* value
Quality of counselling						
Poor	1.000	—	—	1.000	—	—
Good	1.051	0.75–1.47	0.773	1.273	0.80–2.11	0.347
Caregivers' knowledge of when a child should receive the first vaccine						
Incorrect	1.000	—	—	1.000	—	—
Correct	2.498	1.46–4.28	0.001	2.084	1.01–4.29	0.046
Exposure to vaccination messages						
Poor	1.000	—	—	1.000	—	—
Good	3.174	2.06–4.89	0.001	0.922	0.42–2.02	0.840
Radio as a source of RI messages						
No	1.000	—	—	1.000	—	—
Yes	1.854	1.23–2.79	0.001	0.969	0.54–1.73	0.914
Place of worship as a source of RI messages						
No	1.000	—	—	1.000	—	—
Yes	3.953	1.83–8.52	0.001	2.777	1.15–6.67	0.022
CHW as a source of RI messages						
No	1.000	—	—	1.000	—	—
Yes	2.583	1.65–4.04	0.001	1.949	1.14–3.34	0.015
Community leader as a source of RI messages						
No	1.000	—	—	1.000	—	—
Yes	4.502	2.66–7.62	0.001	2.213	1.11–4.41	0.023
Neighbour as a source of RI messages						
No	1.000	—	—	1.000	—	—
Yes	2.555	1.58–4.12	0.001	1.079	0.57–2.06	0.816
Primary decision maker on child vaccination						
Father	1.000	—	—	1.000	—	—
Mother	0.456	0.26–0.79	0.005	0.319	0.15–0.67	0.002
Joint decision	1.310	0.91–1.91	0.142	1.030	0.62–1.71	0.907
Region of residence						
Northeast	1.000	—	—	1.000	—	—
Northwest	1.349	0.96–1.89	0.083	2.601	1.51–4.48	0.001

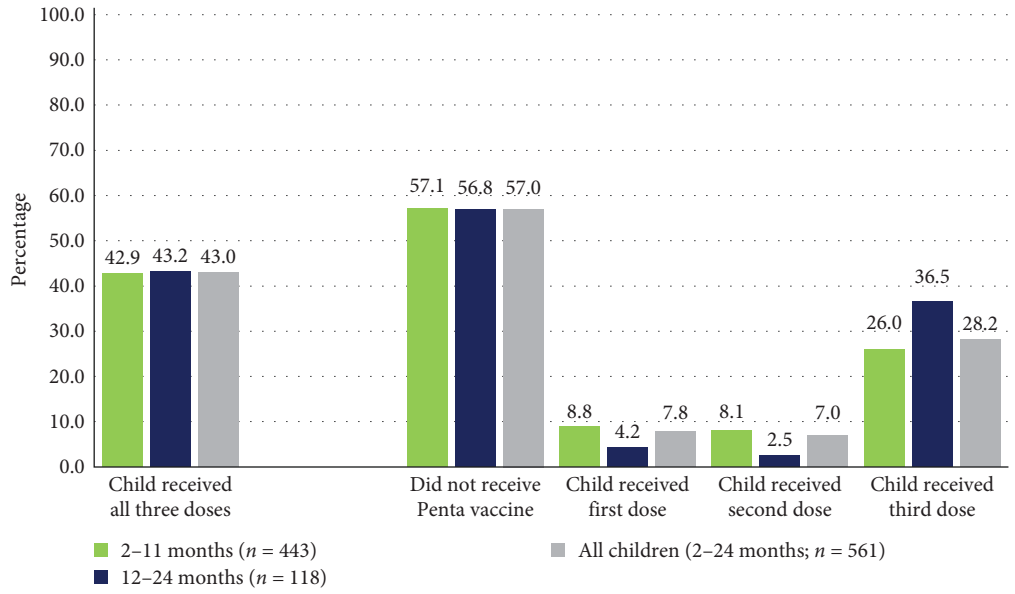

Figure 2: Pentavalent coverage according to doses.

Table 3: Sociodemographic characteristics.

Maternal characteristics	($n = 561$)	
Caregivers age	f	Percentage
15–24 years	196	34.9
25–34 years	280	49.9
35–49 years	85	15.2
Level of education		
No formal education	235	41.9
Primary	103	18.4
Secondary	171	30.5
Tertiary	52	9.2
Occupation		
Housewife	252	44.9
Self-employed	238	42.4
Teaching	5	0.9
Student	11	2.0
Others	55	9.8
Primary decision maker on child vaccination		
Father only	195	34.8
Mother only	95	16.9
Joint decision	271	48.3
Place of residence		
Rural	275	49.0
Urban	286	51.0
Child's characteristics		
Sex of child		
Male	263	46.9
Female	298	53.1
Child's age		
2–11 months	443	79.0
12–24 months	118	21.0
Means of getting to the health facility		
Trekking/walking	368	65.6
Use of motorcycle	125	22.2
Others (bus, car, and bicycle)	68	12.2

first vaccination was significantly associated with the Penta vaccine update ($\chi^2 = 13.776$ and $p = 0.003$).

Concerning exposure, good exposure (those exposed to at least three sources) to child vaccination messages was significantly associated with Penta vaccine uptake ($\chi^2 = 29.286$ and $p = 0.001$). Similarly, receiving child vaccination messages from specific sources, namely, radio ($\chi^2 = 9.914$ and $p = 0.019$), telephone ($\chi^2 = 10.284$ and $p = 0.016$), community leader ($\chi^2 = 38.995$ and $p = 0.001$), CHW ($\chi^2 = 22.107$ and $p = 0.001$), and place of worship ($\chi^2 = 18.786$ and $p = 0.001$), were significantly associated with child vaccination uptake, while sources such as television, newspaper, internet, health worker and community meetings were not significant (Table not shown).

3.5. Multivariate Result. The result of the adjusted binary logistic regression (Table 2) showed that knowledge of when a child should receive their first vaccination, sources of messages on child vaccination, primary decision maker on child vaccination, and region of residence were significantly ($p < 0.05$) associated with the uptake of Penta vaccine.

Caregivers with correct knowledge of when a child should receive the first vaccination were twice as likely to receive the Penta vaccine (aOR = 2.08 and 95% CI = 1.01–4.29, $p = 0.046$) for their child.

Higher odds of Penta vaccine uptake were found among caregivers who received messages about child vaccination from a place of worship (aOR = 2.78 and 95% CI = 1.15–6.67, $p = 0.022$) and community leaders (aOR = 2.21 and 95% CI = 1.11–4.41, $p = 0.023$).

Receiving child vaccination messages from a CHW was associated with nearly two times higher odds of a child receiving the Penta vaccine (aOR = 1.95 and 95% CI = 1.14–3.34, $p = 0.015$). On the other hand, lower odds of receiving the Penta vaccine were found when the mother was the primary decision maker on child vaccination (aOR = 0.32 and 95% CI = 0.15–0.67, $p = 0.002$).

Table 4: Child immunization service, caregivers' knowledge, and exposure to vaccination messages.

		Penta uptake				
	Total ($n = 561$)	No Penta (%)	First dose (%)	Second dose (%)	Third dose (%)	χ^2/p value
Quality of provider–client interaction						
Good	56.1	56.5	8.6	5.7	29.2	$\chi^2 = 2.381$
Poor	43.9	57.7	6.9	8.5	26.9	$p = 0.497$
Caregivers' knowledge						
Knowledge about the purpose of child vaccination card						
Good	30.1	56.8	6.0	8.2	29.0	$\chi^2 = 1.823$
Poor	69.9	57.1	8.7	6.4	27.8	$p = 0.610$
Knowledge about when a child should receive their first vaccination						
Correct	86.0	54.1	7.9	7.9	30.1	$\chi^2 = 13.776$
Incorrect	14.0	74.7	7.6	1.2	16.5	$p = 0.003$
Knowledge about the number of vaccinations a child should receive in the first year of life						
Correct	46.5	57.0	7.7	7.0	28.3	$\chi^2 = 0.029$
Incorrect	53.5	57.0	8.0	7.0	28.0	$p = 0.999$
The caregiver had seen information on the child vaccination in the last 30 days						
Yes	70.2	59.4	7.1	6.6	26.9	$\chi^2 = 3.180$
No	29.8	51.5	9.6	7.8	31.1	$p = 0.365$
Level of exposure to vaccination messages						
Good (≥3 sources)	34.0	41.0	11.9	9.0	38.1	$\chi^2 = 29.286$
Poor (<3 sources)	66.0	68.9	4.6	5.4	21.1	$p = 0.001$

Overall, children of caregivers residing in the northwest region were about three times (aOR = 2.60 and 95% CI = 1.51–4.48, $p = 0.001$) more likely to receive the Penta vaccine relative to their northeast counterparts.

4. Discussion

We assessed how the quality of counselling (provider–client interaction), caregivers' knowledge, and exposure to vaccination messages affect the uptake of the Penta vaccine among children aged 2–24 months in six northern states in Nigeria. First, our study found low Penta vaccine coverage across all age groups, consistent with recent findings [13]. Previous studies have attributed the low coverage and low uptake of the first and second doses of the Penta vaccine to high dropout rates among infants who received the first but not the second dose [38]. These have been attributed to factors including lack of satisfaction with service and poor perception of benefits of vaccination among caregivers [3, 4]. Similarly, another study investigating the determinants of uptake of a third dose of Penta found that children who received the first dose promptly were more likely to complete successive immunizations in accordance with the schedule [39]. This suggests the need to encourage mothers to present their children early for the initial vaccination, in addition to addressing behavioural and institutional factors that could impede these caregivers from the timely presentation of their child for vaccination.

Our study also found that good knowledge regarding when a child should receive the first vaccination was significantly associated with the uptake of the Penta vaccine for the child. This positive association is very important considering the low prevalence of facility delivery and antenatal attendance among caregivers in the northern region of the country [13, 40]. The likelihood of nonfacility delivery among these women apart from negatively affecting knowledge can also affect the timely presentation of the child for vaccination [41]. Besides, it has been shown that adequate knowledge regarding vaccination was inversely associated with a delay in uptake [42]. In addition, our study found that receiving child vaccination messages from a place of worship, a CHW, and traditional leaders was significantly associated with the uptake of the Penta vaccine. This is consistent with a recent study in Sierra Leone [31] that found that the exposure to information on child vaccination from religious leaders and CHWs was associated with child vaccination uptake. However, contrary to the Sierra Leone study, which found exposure to multiple sources of information to be positively associated with vaccination uptake, our present study found no significant association. The significant effect of traditional and religious leaders on child vaccination uptake is very important because of their positive influence in promoting child vaccination, especially in the northern region of the country. Over the years, traditional and religious leaders have proven to be instrumental in championing child vaccination and shaping norms and behaviour, particularly at the community level, where coverage is usually low [18].

Finally, we found that low-quality counselling had no significant effect on the uptake of the Penta vaccine. Notwithstanding, the outcome of our study supports the ongoing effort toward strengthening interpersonal communications and interaction between health providers and their clients [26]. This is critical because of the importance of effective

communication on healthcare delivery and quality. Quality counselling from providers to caregivers will no doubt help to build mutual trust and address bias, myths, and misconceptions about immunization, especially in the northern region of the country, where culture and traditions exert a strong influence on people's way of life and acceptance of basic health interventions.

5. Conclusion

Effective communication strategies are critical to immunization uptake among caregivers because they can enhance their knowledge about the benefits of immunization and correct false impressions or concerns that often prevent caregivers from getting their children immunized. Hence, our findings suggest the need for continuous strengthening of the capacity of routine immunization health workers, by providing them with requisite skills and strategies to interact with their clients. This will build trust, a very important component for vaccination uptake, and address issues around vaccine hesitancy. This study further highlights the important role of community and religious institutions in championing routine child vaccination, especially in the study areas. This is an important consideration for policy makers, program implementers, and relevant stakeholders working towards improving routine child vaccination coverage in Nigeria.

6. Limitation of the Study

This study has some limitations regarding the sample in which the majority of the children were in the younger age group (below 6 months of age). Hence, giving no room for restricting our analysis to the age group 11–23 months to better explore the extent of coverage due to sample size. While sampling was done randomly in most cases at the health facilities, there were fewer instances where caregivers who met the inclusion criteria were found at the health facility. In these cases, all the women were sampled. This might have introduced potential bias. Also, the responses of the caregivers are largely based on current experience and might therefore not be a true reflection of things. Furthermore, findings only capture the experiences of caregivers within the health facility, excluding the experiences of women in the community. More so, the use of cross-sectional survey data poses some limitations concerning establishing causal relationships. Notwithstanding these limitations, our present study has made an important contribution to the literature by stressing the importance of counselling and the role of traditional and religious institutions in promoting improved child vaccination coverage.

Data Availability

All data relevant to the publication can be obtained upon reasonable request to the Population Council (contact Matthew Alabi at malabi@popcouncil.org).

Disclosure

The findings and conclusions arrived at reflect those of the authors and do not, in any way, reflect the positions of the Gates Foundation.

Conflicts of Interest

The authors declare that they have no conflicts of interest.

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