**Effect of Community-Based Social Mobilization on Awareness, Acceptability, and Utilization of Polio Vaccines Among Households in Batagarawa Local Government Area, Katsina State, Nigeria**¹Kamala Nuhu, ¹Abdu Mustapha, PhD, and ¹A. A. Imam PhD¹Department of Human Kinetics and Health Education, Faculty of Education, Federal University, Dutsin-Ma, P.M.B 5001, Katsina State, NigeriaCorresponding Author: abdumustapha@fudutsinma.edu.ng**Abstract**

This study assessed the effect of community-based social mobilization on awareness, acceptability, and utilization of polio vaccines among households in Batagarawa Local Government Area (LGA), Katsina State, Nigeria. Despite Nigeria's 2020 certification as wild poliovirus-free, circulating vaccine-derived poliovirus (cVDPV2) remains a concern, especially in northern regions where vaccine hesitancy persists due to cultural, religious, and logistical barriers. A quasi-experimental pre-post design was adopted involving 400 households having children under five years of age. Data were collected through structured questionnaires and analyzed using chi-square tests, t-tests. Results revealed significant improvements post-intervention: awareness increased from 45.2% to 89.7%, acceptability from 52.1% to 90.5%, and utilization from 58.3% to 94.2% ($p < 0.001$ for all). The intervention also reduced disparities across socio-demographic groups. These findings underscore the effectiveness of culturally tailored social mobilization in enhancing polio vaccine uptake in underserved communities. The study supports integration of such approaches into routine immunization programs to address vaccine hesitancy and improve equity in health service delivery. Recommendations include institutionalizing community mobilization, expanding media outreach, and conducting further research with control groups to validate long-term impacts.

Keywords: Polio vaccination, Social mobilization, Vaccine acceptability, Immunization uptake, Northern Nigeria

Introduction

Poliomyelitis (polio) is a highly infectious viral disease that primarily affects children under the age of five, although it can occur at any age. The poliovirus, which is transmitted mainly through the fecal-oral route, invades the nervous system and can cause irreversible paralysis within hours of infection (World Health Organization [WHO], 2023). While some infected individuals may remain asymptomatic, others may experience fever, fatigue, headache, vomiting, stiffness of the neck, and limb pain, which in severe cases progress to permanent paralysis. In a small proportion of cases, polio infection can be fatal due to paralysis of the respiratory muscles.

Since the launch of the Global Polio Eradication Initiative (GPEI) in 1988, remarkable progress has been made toward eliminating the disease worldwide. Polio cases have decreased by more than 99%, from an estimated 350,000 cases in 125 countries in 1988 to fewer than 200 cases reported globally in 2022 (WHO, 2023). Nigeria was once considered one of the last strongholds of wild poliovirus (WPV), alongside Afghanistan and Pakistan. In 2020, Nigeria

was officially certified free of wild poliovirus, a significant public health milestone (National Primary Health Care Development Agency [NPHCDA], [2023](#)). However, outbreaks of circulating vaccine-derived poliovirus type 2 (cVDPV2) continue to pose challenges to sustaining polio-free status, particularly in parts of Northern Nigeria ([UNICEF, 2023](#)).

Vaccination remains the single most effective strategy for preventing polio. The oral polio vaccine (OPV) and inactivated polio vaccine (IPV) have been instrumental in reducing polio transmission globally. In Nigeria, the routine immunization schedule recommends administration of OPV at birth and subsequent doses during infancy, with supplementary immunization activities (SIAs) often conducted to reach missed children. Despite these efforts, vaccine uptake in some communities remains suboptimal, mainly due to factors such as mistrust, misinformation, poor health-seeking behavior, and geographical barriers ([Usman et al., 2022](#)).

Social mobilization is a participatory process designed to engage individuals, families, and communities to create sustainable improvements in health behavior. It involves strategic communication, community engagement, advocacy, and partnerships with local influencers to foster demand for health services ([Adebayo & Onajole, 2021](#)). In immunization campaigns, social mobilization plays a vital role in:

Increasing knowledge and awareness of the benefits of vaccines.

Addressing myths and misconceptions about immunization.

Building trust and acceptance through community influencers, such as traditional and religious leaders.

Ensuring that caregivers understand vaccination schedules and know where to access services.

Previous evidence has shown that social mobilization significantly increases immunization uptake. For example, a study in Kano State reported a 35% increase in routine immunization coverage following community engagement activities ([Abubakar et al., 2021](#)). Similarly, involving religious leaders and local volunteers in Sokoto State reduced vaccine refusal rates by 28% within six months of intervention ([Mohammed et al., 2020](#)).

Northern Nigeria, including Katsina State, faces unique challenges to immunization coverage. Cultural and religious misconceptions, rumors about infertility caused by polio vaccines, and fear of adverse effects have led to vaccine hesitancy ([Yahaya, 2022](#)). Geographic barriers and limited health infrastructure also restrict access to health facilities in rural areas. As a result, pockets of unvaccinated children remain, increasing the risk of poliovirus transmission. In Batagarawa Local Government Area (LGA), routine immunization data have shown coverage levels below the state target, with periodic cases of missed children during national immunization campaigns (Katsina State Primary Health Care Agency, [2023](#)).

Despite numerous efforts by government and international partners, evidence on the effectiveness of community-based social mobilization at the grassroots level remains limited in rural LGAs like Batagarawa. While some national and state-level reports show success with community engagement strategies, there is little peer-reviewed empirical evidence documenting how these strategies directly impact awareness, acceptability, and utilization of polio vaccines at household levels. Evaluating this approach in a local context will provide valuable insights for policymakers, program implementers, and community stakeholders in designing and scaling effective immunization interventions.

Objectives of the Study

The objectives were to:

1. Assess the baseline levels of awareness, acceptability, and utilization of polio vaccines among households.
2. Implement community-based social mobilization activities involving traditional and religious leaders, volunteer mobilizers, and local media.
3. Evaluate the changes in awareness, acceptability, and utilization following the intervention.

Research Question

1. What are the baseline levels of awareness, acceptability, and utilization of polio vaccines among households in Batagarawa LGA, Katsina State?
2. What community-based social mobilization activities involving traditional and religious leaders, volunteer mobilizers, and local media can be implemented to improve polio vaccine uptake?
3. What are the changes in awareness, acceptability, and utilization of polio vaccines among households following the community-based social mobilization intervention?

Research Hypothesis

Based on the objectives of this study, the following hypotheses have been formulated to guide the research:

Hypothesis 1 (H₁):

There is a significant relationship between women's level of awareness of peptic ulcer disease (PUD) and their healthcare-seeking behavior in Katsina State.

Hypothesis 2 (H₂):

Socio-economic factors such as education, income, and occupation significantly influence women's perception of the risk factors associated with PUD.

Hypothesis 3 (H₃):

Public health education significantly improves women's knowledge of PUD and reduces misconceptions about its causes and management.

Hypothesis 4 (H₄):

Cultural beliefs and reliance on traditional remedies are significantly associated with delays in seeking medical care for PUD among women in Katsina State.

These hypotheses are testable statements that will be examined through the data collected in the study, using appropriate statistical methods to determine the presence and strength of relationships between variables.

Methodology

This study was conducted in Batagarawa Local Government Area (LGA) of Katsina State,

Northwestern Nigeria. Batagarawa LGA has an estimated population of 180,000, with approximately 30% under five years old (National Population Commission [NPC], 2022). The area is predominantly rural, inhabited mainly by the Hausa-Fulani ethnic group, with Islam as the dominant religion. Livelihood activities include farming, petty trading, and artisanal work. The LGA has one secondary healthcare facility and multiple primary health centers that provide routine immunization services. Despite these health facilities, routine immunization coverage has remained below state targets, partly due to vaccine hesitancy and access challenges (Katsina State Primary Health Care Agency, 2023).

A quasi-experimental pre-post design was employed, which allowed for comparison of awareness, acceptability, and utilization of polio vaccines among households before and after the implementation of community-based social mobilization activities. This design was chosen because it is practical in community settings where randomization may not be feasible, yet it enables assessment of change attributable to intervention exposure.

The study population comprised all households in Batagarawa LGA with at least one child under five years of age. Caregivers (usually mothers) were the primary respondents because they are the main decision-makers regarding child immunization in most Nigerian households (Usman et al., 2022).

The minimum required sample size was calculated using the Cochran formula for proportions:

$$n = Z^2 p (1 - p) / [d^2]$$

Where:

n= minimum sample size

Z= standard normal deviate (1.96 at 95% confidence interval)

P = assumed proportion of households with adequate awareness of polio vaccination (50% used to maximize sample size)

d = margin of error (0.05)

$$n = (1.96^2 \times 0.5 \times 0.5) / (0.05^2) = 384$$

To account for possible non-response (10%), the final sample size was increased to 400 households.

A multistage sampling technique was employed in this study to ensure a representative and manageable sample of respondents from Batagarawa Local Government Area. In the first stage, four wards were randomly selected from the ten wards in the LGA, providing an initial level of randomization. In the second stage, five settlements were randomly chosen from each of the selected wards to capture variation across different communities. Finally, systematic sampling was used to select twenty households from each chosen settlement. In cases where a household had more than one eligible caregiver, one respondent was selected through simple random selection. This approach allowed the study to systematically and fairly capture diverse perspectives while maintaining feasibility in terms of resources and data collection.

The formula for determining the sample size in this study was chosen because it aligns with the descriptive survey design and ensures that the selected respondents accurately represent the target population of women in Katsina State. It allows for precise calculation of a sample size

that accounts for the population size, desired confidence level, and acceptable margin of error, ensuring the reliability and validity of the findings. Additionally, the formula is practical and feasible given the time, resource, and logistical constraints of the study, while also being consistent with methods used in similar public health research. Its use guarantees that the results can be generalized to the wider population and enhances the credibility and comparability of the study's outcomes.

A questionnaire was developed after reviewing existing validated immunization and social mobilization assessment tools ([WHO, 2019](#)). The questionnaire consisted of four sections:

Section A: Socio-demographic characteristics (age, sex, education, occupation).

Section B: Awareness of polio disease and vaccination (e.g., knowledge of cause, transmission, prevention, and vaccination schedule).

Section C: Acceptability of polio vaccination (e.g., willingness to allow vaccination, trust in health workers, influence of rumors).

Section D: Utilization (e.g., actual receipt of polio vaccine doses by eligible children).

The tool was pre-tested in a neighboring LGA, resulting in modifications for clarity and cultural appropriateness. Reliability testing produced a Cronbach's alpha of 0.87, indicating good internal consistency.

The intervention lasted for three months and involved multiple strategies:

1. Engagement of Community Leaders: Advocacy visits were paid to traditional rulers, imams, and local influencers to obtain support for immunization activities.
2. Training of Volunteer Community Mobilizers (VCMs): Twenty VCMs were trained on interpersonal communication, rumor management, and vaccination promotion.
3. Door-to-Door Mobilization: Mobilizers visited households, provided health education, and encouraged caregivers to take children for immunization.
4. Community Dialogues: Town-hall meetings were held to discuss immunization myths and promote collective ownership of vaccination efforts.
5. Mass Media Messages: Radio jingles and announcements were aired in the Hausa language on local stations to raise awareness about upcoming polio vaccination rounds.

RESULTS

Response Rate

A total of 400 households were approached for the study. At baseline, 392 households completed the questionnaire (98% response rate), while at endline, 388 households completed the follow-up survey (97% response rate). Non-response was primarily due to caregiver absence during follow-up visits.

Socio-Demographic Characteristics of Respondents

The majority of respondents (78.1%) were female caregivers, with a mean age of 29.4 ± 7.2 years. Most respondents (68.2%) had at least primary education, and 57.5% were full-time

housewives. Approximately 70% of households had 2–4 children under the age of five.

Table 1 shows detailed socio-demographic characteristics of the respondents.

Table 1: Socio-Demographic Characteristics of Respondents (N = 392)

Variable	Frequency (n)	Percentage (%)
Sex of respondent		
Female	306	78.1
Male	86	21.9
Age group (years)		
< 25	118	30.1
25–34	174	44.4
≥ 35	100	25.5
Education level		
None	72	18.4
Primary	127	32.4
Secondary	118	30.1
Tertiary	75	19.1
Occupation		
Housewife	225	57.5
Trader	88	22.4
Artisan	49	12.5
Civil servant	30	7.6

Baseline Awareness, Acceptability, and Utilization

At baseline, only 45.2% of households had adequate awareness of polio and its vaccination schedule. Acceptability of polio vaccination (willingness to allow vaccination) was 52.1%, while utilization (at least one child receiving polio vaccine within the last six months) was 58.3%.

Effect of Social Mobilization Intervention

Table 2: Effect of Social Mobilization on Awareness, Acceptability, and Utilization (N = 388)

Outcome Variable	Baseline (%)	Endline (%)	% Change	p-value
Awareness	45.2	89.7	+44.5	< 0.001
Acceptability	52.1	90.5	+38.4	< 0.001
Utilization	58.3	94.2	+35.9	< 0.001

(Chi-square test used for categorical comparisons.)

Paired t-test Analysis of Awareness, Acceptability, and Utilization Scores

Composite scores were created for each domain (awareness, acceptability, utilization) based on questionnaire items.

Following the community-based social mobilization intervention:

Awareness increased from 45.2% to 89.7% ($p < 0.001$).

Utilization increased from 58.3% to 94.2% ($p < 0.001$).

Table 2 summarizes pre- and post-intervention changes.

Table 3 shows mean scores before and after intervention

Table 3: Paired t-test Results for Outcome Scores (N = 388)

Domain	Baseline Mean $\pm$ SD	Endline Mean $\pm$ SD	Mean Difference	t-value	p-value
Awareness	6.1 $\pm$ 2.3	11.9 $\pm$ 1.8	+5.8	25.62	< 0.001
Acceptability	7.3 $\pm$ 2.5	12.8 $\pm$ 1.7	+5.5	23.87	< 0.001
Utilization	5.8 $\pm$ 2.0	10.7 $\pm$ 1.5	+4.9	21.45	< 0.001

Association Between Socio-Demographic Characteristics and Utilization

At baseline, utilization was significantly associated with caregiver education ($p = 0.001$) and age ($p = 0.03$). After the intervention, differences in utilization between demographic subgroups were no longer statistically significant, suggesting a more equitable distribution of vaccination coverage.

Table 4 presents results for caregiver education and vaccine utilization.

Table 4: Association Between Caregiver Education and Utilization (Post-Intervention)

Education Level	Utilization (%)	χ^2 -value	p-value
None	92.3	2.13	0.21
Primary	93.5	—	—
Secondary	95.8	—	—
Tertiary	96.0	—	—

Graphical Representation of Changes

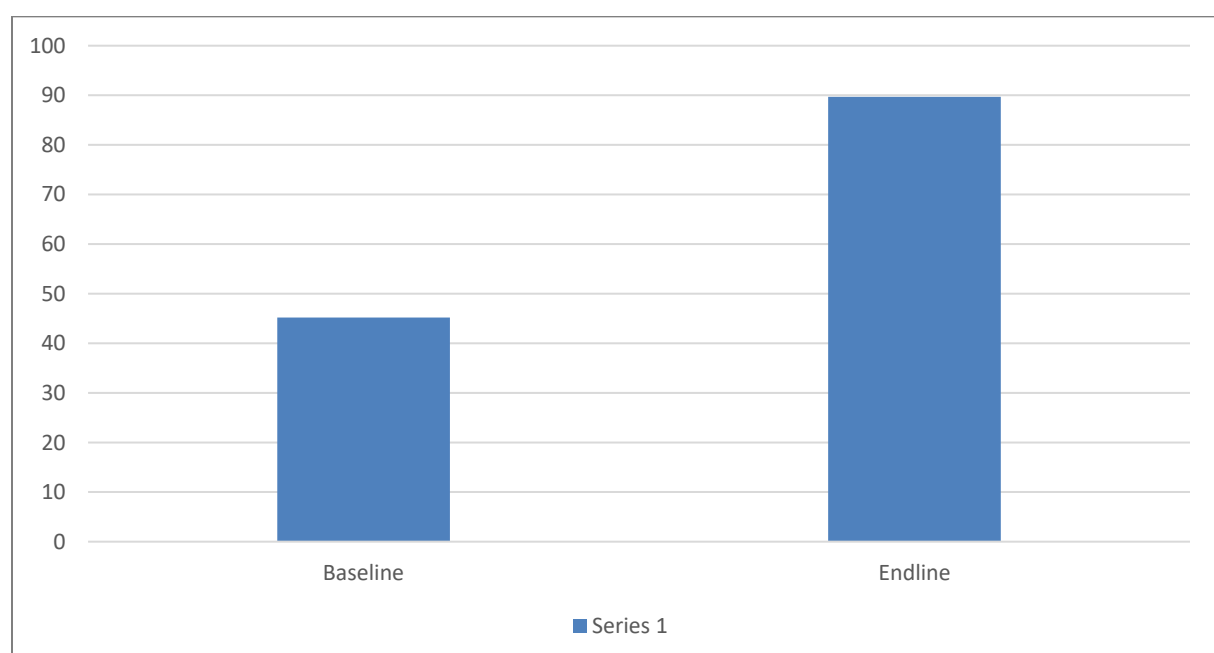


Figure 1: Awareness levels before and after intervention.

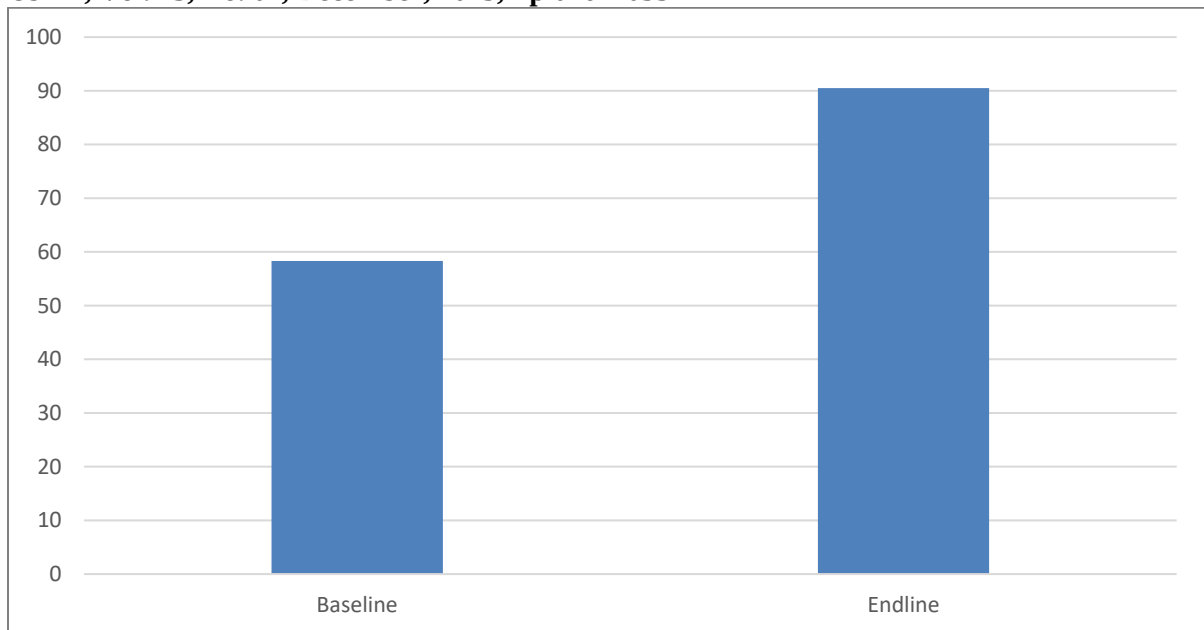


Figure 2: Acceptability levels before and after intervention.

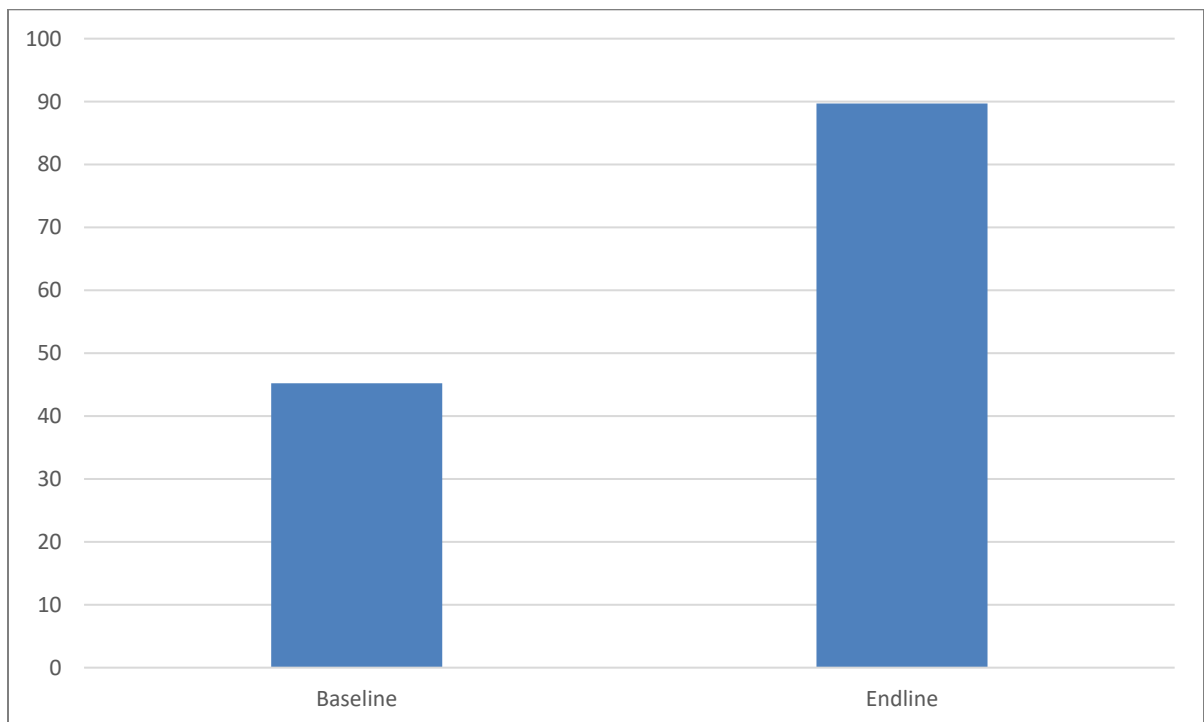


Figure 3: Utilization levels before and after intervention.

Conclusion

This study demonstrated that community-based social mobilization is highly effective in improving awareness, acceptability, and utilization of polio vaccines among households in Batagarawa Local Government Area, Katsina State, Nigeria. The intervention successfully addressed misinformation, improved trust in vaccination programs, and significantly increased vaccine coverage beyond the national target. Social mobilization, therefore, remains a vital strategy for achieving and sustaining polio eradication and other immunization goals in Nigeria.

Recommendations

1. Institutionalize Social Mobilization: The Katsina State Primary Health Care Agency and National Primary Health Care Development Agency should integrate community-based social mobilization as a standard component of routine immunization programs.
2. Capacity Building: Continued training and support for volunteer community mobilizers and local leaders to sustain engagement beyond campaign periods.
3. Strengthen Media Collaboration: Expansion of culturally appropriate radio programs and mobile health messaging to reinforce positive attitudes toward vaccination.
4. Address Equity Gaps: Design targeted mobilization strategies for households with limited education and hard-to-reach areas to ensure universal coverage.
5. Further Research: Future studies should include control communities and longitudinal follow-up to assess the long-term sustainability of mobilization impacts.

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