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ORIGINAL RESEARCH

Bridging the Knowledge Gap and Enhancing Acceptance of the Rotavirus Vaccine Among Mothers in Nigeria: A Descriptive Cross-sectional Study

Un puente hacia el conocimiento sobre el rotavirus y la aceptación de la vacuna para prevenirlo entre madres de Nigeria: estudio transversal descriptivo

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Abstract

Background. Rotavirus remains a leading cause of severe diarrhea and mortality among children under five, particularly in low-income countries such as Nigeria. Despite the proven effectiveness of rotavirus vaccines, uptake remains low due to cultural beliefs, misinformation, and limited awareness. **Methods.** A descriptive cross-sectional study was conducted to assess knowledge, attitudes, and willingness to accept the rotavirus vaccine among mothers in the Ilorin East Local Government Area, Kwara State, Nigeria. A total of 270 participants were surveyed between April and July 2024 using an interviewer-administered structured questionnaire. **Results.** Only 30% of respondents had heard of the rotavirus vaccine, and just 20% were aware of its protective benefits. Cultural beliefs and misconceptions about vaccine safety significantly influenced acceptance, with only 25% of mothers considering vaccines safe for their children. **Conclusion.** The study reveals substantial gaps in knowledge and vaccine acceptance among mothers in Ilorin East. Strengthened health education campaigns and community-based interventions—particularly those involving local health workers—are essential to dispel misconceptions, improve vaccine confidence, and enhance rotavirus immunization coverage.

Keywords: Rotavirus Vaccine, Vaccine Acceptance, Child Health, Public Health, Immunization Programs.

Resumen

Antecedentes. El rotavirus sigue siendo una de las principales causas de diarrea grave y mortalidad en niños menores de cinco años, especialmente en países de bajos ingresos como Nigeria. A pesar de la eficacia demostrada de las vacunas contra el rotavirus, su nivel de aplicación sigue siendo baja debido a creencias culturales, desinformación y poca concientización. **Métodos.**Se realizó un estudio descriptivo transversal para evaluar los conocimientos, las actitudes hacia y la disposición a aceptar la vacuna contra el rotavirus entre las madres del Área de Gobierno Local de Ilorin del Este, estado de Kwara , Nigeria. Se encuestó a un total de 270 participantes entre abril y julio de 2024 mediante un cuestionario estructurado administrado por un entrevistador. **Resultados.** Solo el 30% de las encuestadas había oído hablar de la vacuna contra el rotavirus y solo el 20% conocía sus beneficios protectores. Las creencias culturales e ideas erróneas en torno a la seguridad de las vacunas influyeron significativamente en su aceptación; solo el 25% de las madres consideraban que las vacunas eran seguras para sus hijos. **Conclusión.** El estudio revela importantes deficiencias en el conocimiento sobre y la aceptación de las vacunas entre las madres de Ilorin del Este. El fortalecimiento de campañas de educación en salud y las intervenciones comunitarias, en particular las que involucran a los profesionales de salud locales, son esenciales para disipar dichas ideas, aumentar la confianza en las vacunas y ampliar la cobertura de la vacunación contra el rotavirus.

Palabras clave: Vacuna contra el rotavirus, aceptación de la vacuna, salud infantil, salud pública, programas de inmunización

Rotavirus is a leading cause of severe gastroenteritis in children worldwide, particularly in developing countries. It accounts for a significant proportion of hospitalizations and deaths among children under five years of age. The World Health Organization (WHO) estimates that rotavirus causes approximately 215,000 deaths annually in this age group, with the highest burden occurring in low-income countries (1). In Nigeria, rotavirus remains a major contributor to childhood morbidity and mortality, responsible for an estimated 33,000 deaths each year among children under five (2).

The disease is characterized by severe diarrhea, vomiting, and dehydration, which can lead to hospitalization and, in severe cases, death if not promptly treated (3). Despite the availability of effective vaccines, acceptance and uptake of the rotavirus vaccine remain low in many regions, including Nigeria. Several factors contribute to this low acceptance, including cultural beliefs, misinformation, and limited awareness about the disease and its prevention (4). For instance, studies have shown that misconceptions regarding vaccine safety and efficacy significantly influence caregivers' decisions about immunization (5). Furthermore, the stigma associated with vaccination—often rooted in cultural norms and beliefs—can discourage caregivers from seeking immunization for their children (1).

Contextual Background on Immunization in Nigeria

Nigeria's National Programme on Immunization (NPI) includes vaccines against tuberculosis (BCG), diphtheria, pertussis, tetanus (DPT), hepatitis B, *Haemophilus influenzae* type b (Hib), polio, measles, yellow fever, and pneumococcal conjugate vaccine (PCV) (6). The rotavirus vaccine was introduced into Nigeria's routine immunization schedule in 2022 (7), following WHO recommendations for its inclusion in countries with high rotavirus mortality rates.

Despite this advancement, immunization coverage in Nigeria remains suboptimal. According to the 2021 National Demographic and Health Survey (NDHS), only 57% of children aged 12–23 months received all basic vaccinations, highlighting significant gaps in immunization uptake (8). The introduction of the rotavirus vaccine aimed to reduce the high burden of diarrheal diseases, but its coverage has been hindered by systemic challenges such as vaccine hesitancy, logistical constraints, and inadequate health education (9).

Rationale for the Study

The recent introduction of the rotavirus vaccine into Nigeria's immunization schedule underscores the need to understand caregivers' perceptions and barriers to its acceptance. Unlike long-established vaccines such as BCG or measles, the rotavirus vaccine is relatively new, and its integration into existing programs may face unique challenges. Studies indicate that new vaccine introductions often encounter skepticism due to limited awareness and entrenched misconceptions (10). For example, in neighboring Ghana, the introduction of the rotavirus vaccine in 2012 initially faced low uptake due to fears of side effects and lack of trust in health authorities (11). Similar trends are likely in Nigeria, where vaccine hesitancy is compounded by cultural beliefs and misinformation (12).

Nigeria's healthcare system is characterized by a dual structure of formal and informal care. A significant proportion of the population, particularly low-income groups, relies on traditional healers, community pharmacies, and unlicensed providers due to financial constraints and geographic barriers (13). This context is essential to understanding the study's sample, which included only mothers accessing formal primary care facilities. Research indicates that caregivers utilizing formal health services generally have higher socioeconomic status (SES), better health literacy, and greater exposure to immunization programs than those relying on informal care (14).

For instance, a 2023 study in Kwara State found that only 38% of low-income families used primary health centers for childhood vaccinations, while 62% sought informal alternatives (15). This suggests potential socioeconomic bias in our sample, as marginalized groups facing the greatest barriers to vaccine access—such as indirect costs (despite free vaccines), transportation difficulties, or distrust in the health system—may be

underrepresented. Additionally, administrative hurdles such as vaccine stockouts and inflexible clinic hours further limit uptake (16). These factors are particularly relevant for the rotavirus vaccine, introduced in 2022 amid existing systemic challenges, and must be considered when interpreting findings on knowledge gaps and acceptance.

This study focuses on Ilorin East LGA, Kwara State, to assess the knowledge, attitudes, and willingness of mothers to accept the rotavirus vaccine. By identifying gaps in awareness and contextual barriers, the findings will inform targeted interventions to improve vaccine uptake. Given the recent inclusion of the rotavirus vaccine in Nigeria's immunization schedule, this research is both timely and essential for optimizing immunization strategies and reducing childhood mortality from rotavirus infections.

Methodology

Study Design

This study employed a descriptive cross-sectional design to assess the knowledge, attitudes, and willingness of mothers and caregivers regarding the rotavirus vaccine in Ilorin East Local Government Area (LGA), Kwara State, Nigeria.

Study Area

Kwara State, located in Nigeria, shares borders with Kogi State to the east, Niger State to the north, and Ekiti, Osun, and Oyo states to the south. The capital of Kwara is Ilorin, encompassing 16 local government areas within a land area of 36,825 square kilometers and a population of 2,365,353 as per the 2006 National Population Census (10). This study focuses on the Ilorin East Local Government Area (LGA), which lies between 8º5'N latitude and 4º33'E longitude, marking a transitional zone between Northern and Southern Nigeria. Established in 1991 from the former Ilorin Local Government, Ilorin East LGA has its headquarters in Oke-Oyi and covers 486 square kilometers, with a recorded population of 207,462 in 2006, and an estimated 311,500 in 2022 (10). The area houses 39 primary health care centers, including 13 privately-owned hospitals and 26 government health centers, alongside one tertiary institution, the University of Ilorin Teaching Hospital. Routine immunization clinic days differ across facilities. Women of childbearing age (15-49 years) make up 22.6% of the population, which translates to approximately 70,399 women in Ilorin East.

Study Population

This study was carried out in Ilorin East LGA of Kwara State between April and July 2024 among caregivers accessing immunization services in primary healthcare facilities. The study population consisted of mothers and caregivers of children aged 0-15 months residing in Ilorin East LGA. The inclusion criteria for participants required that mothers and caregivers had lived in the study area for at least 12 months to ensure familiarity with local health services and immunization practices. Additionally, participants were required to provide informed consent to participate in the study. Exclusion criteria included mothers and caregivers whose children were very sick at the time of the study, as their immediate health concerns could influence their responses and willingness to participate; as well as individuals who declined to participate for any reason.

Sample Size Determination

The sample size for the study was calculated using the formula for estimating proportions in a population greater than 10,000. The formula used is as follows:

$$n = \frac{z^2 pq}{d^2}$$

Where n represents the required sample size, Z is the Z-value (1.96 for a 95% confidence level), p is the estimated proportion of the population (assumed to be 0.5 for maximum variability), and d is the margin of error (0.05). Using this formula, a total of 270 participants were determined to be necessary to achieve statistically significant results. This sample size was deemed sufficient to provide reliable data on the knowledge, attitudes, and willingness of mothers and caregivers regarding the rotavirus vaccine.

Data Collection

Data were gathered using a structured questionnaire designed to assess knowledge, attitudes, and willingness to accept the rotavirus vaccine. The instrument included sections on demographic information, knowledge of rotavirus and its vaccine, attitudes toward vaccination, and willingness to vaccinate children against rotavirus.

The data collection process involved several key steps to ensure the integrity and reliability of the information obtained. First, the questionnaire was developed based on existing literature and validated through a pilot study conducted with a small group of mothers and caregivers to ensure clarity and relevance of the questions. Subsequently, a team of trained research assistants was recruited to administer the questionnaires. They received training on ethical considerations, informed consent procedures, and effective communication with participants.

Eligible and consenting mothers or caregivers who brought their babies or wards for immunization and growth monitoring visits at primary healthcare facilities were interviewed before the commencement of clinic activities. Data collection spanned approximately 12 weeks, during which the target sample size was achieved. The questionnaires were administered in person by the trained research assistants in private settings to encourage honest and open responses. Each participant was given sufficient time to complete the questionnaire, with assistance provided when necessary.

Data Analysis

Data collected from the questionnaires were then coded and entered into a statistical software program for analysis. The results were analyzed to identify trends and correlations related to the knowledge, attitudes, and willingness to accept the rotavirus vaccine among mothers and caregivers in the study area. This comprehensive methodology aimed to ensure the reliability and validity of the findings, contributing valuable insights regarding vaccine acceptance in the target population.

Ethical Considerations

Ethical approval for the study was obtained from the University of Ilorin Ethical Review Committee, with clearance number UERC/ASN/2024/2771. This ensured that the study adhered to ethical standards and protected the rights and welfare of participants. Before participation, informed consent was secured from all participants, who were provided with information about the study's purpose, procedures, potential risks and benefits, along with assurances of the confidentiality of their responses. Participants were informed that they could withdraw from the study at any time without any penalty, and all data collected were kept confidential, identified only by serial numbers to protect participant anonymity.

Limitations of the Study

While providing valuable insights, several limitations merit consideration. The cross-sectional design precludes causal inferences, and potential response bias may affect self-reported data. The exclusive focus on formal healthcare users (excluding 38% of the population utilizing informal services) may limit generalizability. Additionally, unmeasured variables like transportation challenges and exact vaccine availability at the time of visits were not quantified.

Results

Table 1a presents a comprehensive overview of the sociodemographic characteristics of the respondents, revealing a critical insight into the population. The age distribution indicates that a substantial 42.6% of the respondents are aged between 20 and 30 years, suggesting a predominantly younger demographic of mothers with children. The mean age of 33.51 years, along with a standard deviation of 6.29, points to a relatively homogeneous group regarding age. The respondents are predominantly married (73%), reflecting societal norms around family structures.

Table 1a**: Socio-demographic characteristics of respondents**

Variables	Frequency (N=270)	Percentage (%)
Age groups		
20-30	115	42.6
31-40	73	27.0

41- 50 Above 50 **Mean ± SD**	47 35 33.51 ± 6.29	17.4 13.0
None	90	33.3
Primary	52	19.3
Secondary Tertiary **Occupation** Farming Fulltime housewife Petty trader/business Public/Civil servant **Number of Children**	 65 63 50 44 121 55	 24.1 23.3 18.5 16.3 44.8 20.4
1-3	146	54.1
4-5	87	32.2
Above 5	37	13.7
Number of Children who completed Vaccination		
0 1	175 22	40.7 11.9
2	30	17.8
3 4 5	29 26 4	17.0 9.6 1.5
7	2	0.7

Source: primary data

Occupationally, the data show diversity, with 44.8% engaged in petty trading or business, indicating a significant level of self-employment. In terms of education, only 19.3% of the respondents completed primary education, while a mere 23.3% achieved tertiary education, signifying potential barriers to understanding health-related information and making informed decisions about vaccinations. The breakdown of the number of children reveals that over half (54.1%) have between one to three children, and 40.7% have completed vaccination schedules, implying varying levels of exposure to healthcare services. Occupationally, the data show diversity, with 44.8% engaged in petty trading or business, indicating a significant level of self-employment. In terms of education, only 19.3% of the respondents completed primary education, while a mere 23.3% achieved tertiary education, signifying potential barriers to understanding health-related information and making informed decisions about vaccinations. The breakdown of the number of children reveals that over half (54.1%) have between one to three children, and 40.7% have completed vaccination schedules, implying varying levels of exposure to healthcare services.

Table 1b: Socio-demographic characteristics of respondents

Variables	**Frequency (N=270)**	**Percentage frequency (%)**
Religion		
Christianity	91	33.7
Islam	179	66.3
Marital Status		
Single	57	21.1
Married	184	73.0
Divorced/Separated	12	4.4
Widowed	4	1.5
Tribe		
Yoruba	201	
Igbo	7	71.4
Hausa	25	5.0
Others	37	9.2
		20.4

Source: primary data

Accompanying the main demographic data, Table 1b dives deeper into the variables of religion, marital status, and tribal affiliation among the respondents. The findings reveal a predominantly Muslim population (66.3%), which may influence attitudes toward healthcare practices and vaccination. The marital status data further emphasize that the majority are in stable marital relationships, potentially affecting their support systems and decision-making processes regarding child health. The tribal composition shows the dominance of the Yoruba ethnic group, which

Table 2: Knowledge of Risk Factors and Causes of Rotavirus Infection

Variables	**Frequency (N=270)**	**Percentage (%)**

Ever heard about the rotavirus infection?		
Yes	202	74.8
No	68	25.2
Rotavirus infection causes diarrhea		
Yes	128	47.4
No	10	3.7
I don't know	132	48.9
Rotavirus infection causes vomiting		
Yes	119	44.1
No	10	3.7
I don't know	141	52.2
Rotavirus infection causes fever		
Yes	125	46.3
No	4	1.5
I don't know	141	52.2
Mild cases of rotavirus infection can be managed with oral rehydration salts and zinc		
Yes	90	33.3
No	0	0.0
I don't know	180	66.7
Rotavirus infection can be prevented through vaccination		
Yes	138	51.1
No	7	2.6
I don't know	125	46.3
Modes of transmission of rotavirus		
Fecal-Oral	27	10.0
Airborne droplets	4	1.5
Contaminated Water	37	13.7
I don't know	202	74.8
Information sources about rotavirus		
Television/social media	31	11.5
Health Facility	111	41.1
Family/Friends	84	31.1
Others	44	16.3

Source: primary data

accounts for 71.4% of the respondents. This concentration could have implications for culturally tailored health messaging and interventions, underscoring the importance of understanding ethnicity in health promotion strategies.

Table 2 evaluates the respondents' knowledge regarding rotavirus infection, highlighting significant gaps in understanding. While a promising 74.8% have heard of rotavirus, only 47.4% recognize its link to diarrhea. This disparity suggests that, although awareness exists, the depth of knowledge about the infection's implications is limited.

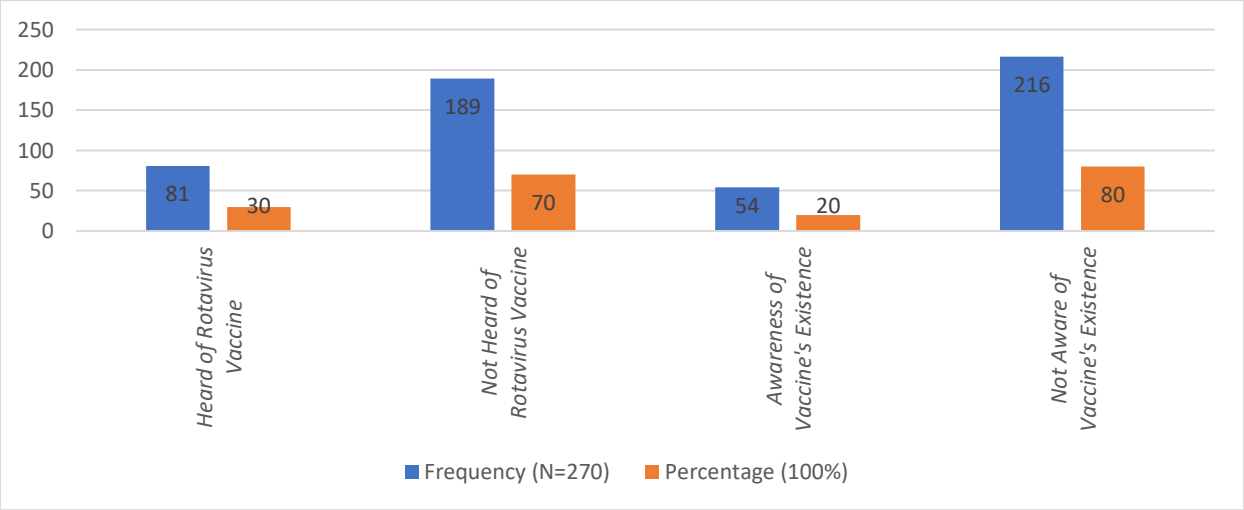
Alarmingly, 66.6% do not know that rotavirus can be managed with oral rehydration salts, and only about half understand that vaccination can prevent the infection. This indicates a clear need for educational interventions addressing both the understanding of rotavirus transmission and prevention. Furthermore, the primary sources of information, which include health facilities and media, highlight the necessity of leveraging these platforms to raise awareness effectively.

Figure 1 presents the level of awareness of the rotavirus vaccine among the 270 participants surveyed. The data indicate that 30% of respondents had heard of the rotavirus vaccine, while 20% reported more detailed awareness regarding its purpose or availability. This

distinction suggests a critical gap in vaccine-related knowledge that warrants further investigation.

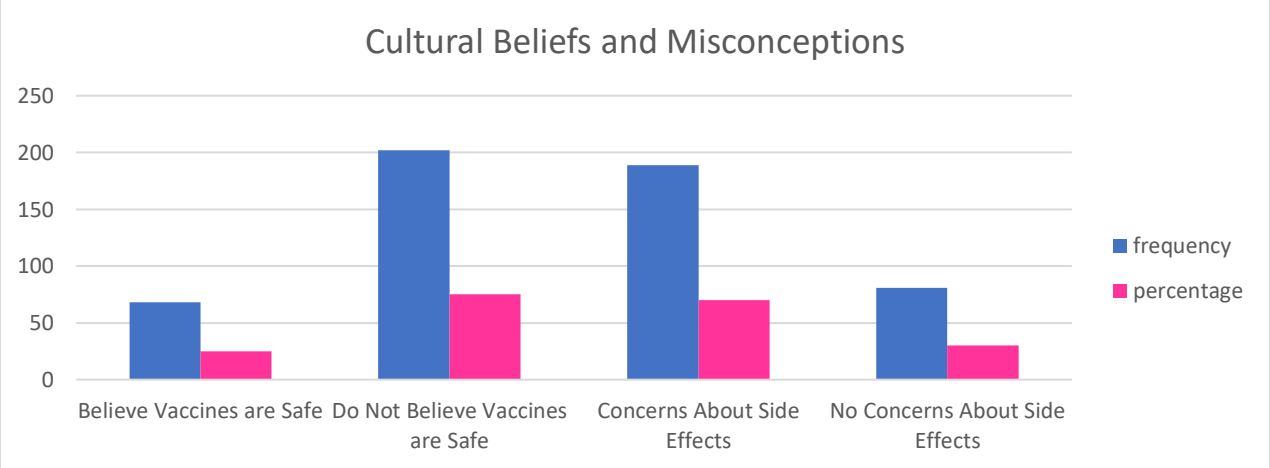
These findings underscore the importance of public health campaigns aimed at increasing awareness and understanding of the Rotavirus vaccine. The low level of awareness could contribute to lower vaccination rates and increased susceptibility to rotavirus infections. Therefore, targeted educational initiatives are essential to inform the community about the vaccine's benefits and availability, ultimately aiming to improve public health outcomes related to rotavirus

Figure 1: Awareness of Rotavirus Vaccine Among Participants



Source: primary data

Figure2: Cultural and Misconception about Rotavirus vaccine



Source: primary data

Table 3: Knowledge of Rotavirus Vaccine by respondents

Variables	Frequency (N=270)	Percentage (%)

Heard of rotavirus vaccine		
Yes	86	31.9
No	184	68.1
Information sources about rotavirus vaccine		
Television/social media/posters	10	3.7
Health Facility	48	17.8
Immunization card	51	18.9
Family/Friends	44	16.3
Others	33	12.2
None	84	31.1
Rotavirus vaccine administering mode	13	4.8
Injection	40	14.8
Orally	217	80.4
Do not know		
Number of rotavirus vaccine doses should a child receive	7	2.6
One	25	9.3
Two	11	4.1
Three	2	0.7
More than three	225	83.3
I don't know		
Age a child receives the first dose of rotavirus vaccine	29	10.7
6 weeks	9	3.3
10 Weeks	9	3.3
14 weeks	223	82.6
I don't know		
Rotavirus Vaccine can be given along with other vaccines		
Yes	35	13.0
No	9	3.3
I don't know	226	83.7
Rotavirus vaccine has adverse effects		
Yes	64	23.7
No	83	30.7
I don't know	123	45.6

Source: primary data

In Table 3, the data on the respondents' knowledge of the rotavirus vaccine reveals a concerning trend. Although 31.9% are familiar with the vaccine, many lack knowledge regarding its administration and required doses. Most notably, 83.3% do not know how the vaccine is given, indicating a significant hurdle in vaccine acceptance. Furthermore, the confusion surrounding the age for the first dose and whether the vaccine can be taken alongside others exemplifies the unclear communication about vaccination protocols. The perception of adverse effects remains an area of concern, as only 23.7% acknowledge the possibility of such effects. This lack of awareness can negatively impact vaccine uptake and reflects the need for more robust health education focusing on safe vaccination practices.

Figure 2 provides valuable insights into the cultural beliefs and misconceptions surrounding the Rotavirus vaccine. The data reveals a notable split in perceptions regarding vaccine safety among the participants. Specifically, only 68 out of 270 participants, which accounts for approximately 25.2%, believe that vaccines are safe. In contrast, a staggering 189 participants, representing about

70%, expressed concerns about potential side effects associated with the vaccine.

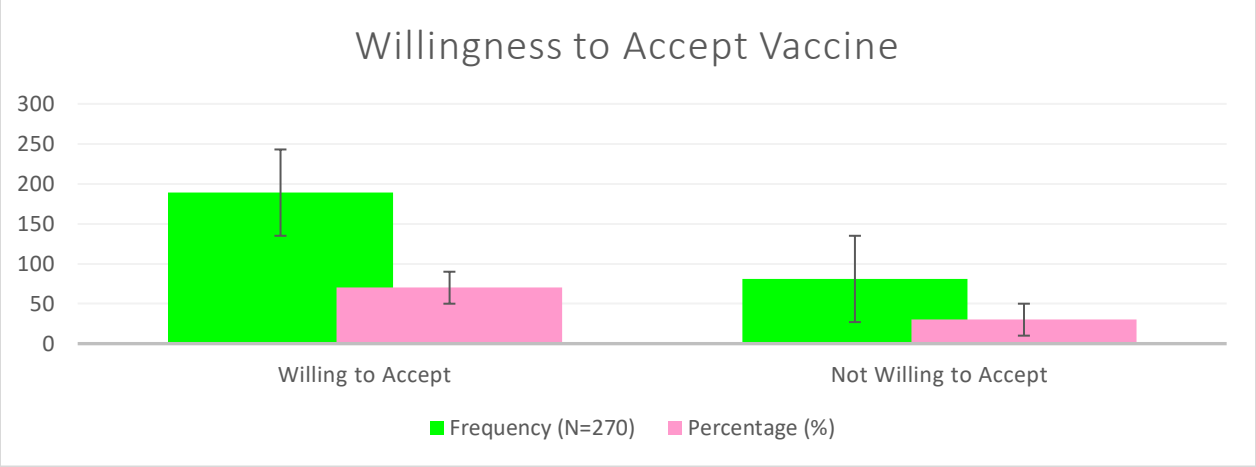
This significant disparity indicates that while a minority of individuals have confidence in the safety of vaccines, a substantial majority harbor fears and misconceptions that could hinder vaccine acceptance. Addressing these concerns through targeted education and communication strategies is crucial for alleviating fears and improving overall acceptance of the Rotavirus vaccine. Understanding these cultural beliefs is essential for public health initiatives aimed at increasing vaccination uptake and ensuring the health and well-being of the community.

Figure 3 depicts the willingness of participants to accept the Rotavirus vaccine. The results show that a substantial number of individuals (over 200 participants- 70%) are willing to accept the vaccine, while a smaller group is not willing to do so. This positive trend in willingness to accept the vaccine is encouraging, as it suggests that many individuals recognize the importance of vaccination in preventing rotavirus infections. However, the presence of those who are not willing to accept the vaccine (30%) highlights the need for further education and engagement to address their concerns and misconceptions. Overall, the data indicates a favorable attitude towards the Rotavirus vaccine, which can be built upon to enhance public health outcomes.

Table 4 assesses the acceptance of the rotavirus vaccine among the study participants and provides some optimistic insights. A notable 72.6% of mothers express willingness to allow their children to receive the vaccine, and 70.4% would recommend it to others. These numbers demonstrate a foundational openness to vaccination, which is encouraging.

However, the data in Table 4 also reveal significant concerns, with 78.1% of participants expressing varying worries about the vaccine, particularly regarding safety and side effects. More than two-thirds of the respondents who voiced concerns experienced multiple apprehensions about the vaccine's safety, dosage, and novelty. These findings suggest that while there is willingness, addressing concerns and fears through targeted education and assurance is essential to enhance the acceptance rates of the rotavirus vaccine and ultimately contribute to better public health outcomes.

Figure 3: Willingness to accept Rotavirus vaccine



Source: primary data

Table 4: Acceptance of the Rotavirus Vaccine Among the Respondents

Variables	Freq. (N=270)	Percentage (%)
Will allow your children to receive rotavirus vaccine		

Yes	196	72.6
No	74	27.4
Will recommend rotavirus vaccine to other mothers		
Yes	190	70.4
No		26.7
I don't know	72	2.9
Will you advocate that rotavirus vaccine be discarded from	8	
the National Programme of immunization?		34.1
Yes		65.9
No		
Do have any concerns about the vaccine	92	78.1
Yes	178	21.9
No		
Concerns about the vaccine	211	7.0
Safety	59	13.0
Side effects		2.6
Newness	19	8.1
Dosage	35	69.3
More than one concern and other concerns	7	
	22	
	187	

Source: primary data

Discussion

The findings of this study underscore the critical role that knowledge, attitudes, and willingness to accept the rotavirus vaccine play in improving immunization rates among children in Ilorin East, Nigeria. Despite the proven efficacy of the rotavirus vaccine in preventing severe gastroenteritis, our results reveal a concerning gap in awareness and understanding among caregivers. Only 30% of participants reported being aware of the vaccine, consistent with previous studies showing low levels of knowledge about rotavirus and its associated health risks (11, 12). This limited awareness remains a significant barrier to vaccine uptake and highlights the urgent need for targeted educational interventions.

Cultural beliefs and misconceptions about vaccination were also identified as key factors influencing acceptance of the rotavirus vaccine. Many caregivers expressed concerns about vaccine safety and efficacy, reflecting a broader trend observed in various populations where misinformation and fear deter vaccination efforts (13, 14). Addressing these concerns through community engagement and education is essential. Health educators and policymakers should develop culturally sensitive communication strategies that resonate with the target population, emphasizing the proven benefits of vaccination while dispelling myths surrounding vaccine safety.

Furthermore, the cross-sectional design of this study limits the ability to establish causal relationships between knowledge, attitudes, and vaccine acceptance. Future research should incorporate longitudinal designs to better understand how shifts in knowledge and attitudes over time influence vaccination behavior. Additionally, reliance on self-reported data may introduce bias, as participants could provide socially desirable responses rather than their genuine beliefs or practices (15). To mitigate this limitation, mixed-methods approaches incorporating qualitative interviews could yield deeper insights into caregivers' motivations and barriers.

The sample size of 270 participants was calculated to ensure statistical significance; however, the study's geographic focus on Ilorin East may limit the generalizability of the findings to other regions in Nigeria or similar contexts (16). Future studies should aim to include more diverse populations to

capture a broader range of experiences and perceptions regarding the rotavirus vaccine.

In addition, recruiting mothers exclusively from formal healthcare settings introduces a socioeconomic bias that may underestimate barriers faced by marginalized populations. In Nigeria, informal care utilization remains disproportionately high among low-SES groups due to costs (including indirect expenses such as transportation), cultural preferences, and geographic inaccessibility (17). For instance, a national survey found that rotavirus vaccine coverage was 22% lower in rural communities relying on informal providers compared to urban formal-care users (9). This aligns with our finding that 80% of participants were unaware of the vaccine's existence, a gap likely exacerbated by the absence of targeted outreach in informal care channels. Similarly, the 30% unwillingness to accept vaccination may reflect broader systemic issues. In Kwara State, for example, 40% of health facilities reported rotavirus vaccine stockouts in 2023 (18), an issue that can erode trust and amplify hesitancy. Future studies should purposively include informal-care users to better capture these disparities.

The alarming knowledge gap, 80% of participants being unaware of the vaccine, appears to stem from three interrelated factors:

1. **Ineffective public health campaigns:** Nigeria's rotavirus vaccine rollout lacked community-tailored education, unlike successful measles campaigns that reduced hesitancy by 35% through religious leader engagement (19).
2. **Timing:** As a newly introduced vaccine (2022), rotavirus lacks the longstanding visibility of polio or BCG vaccines, which benefit from decades of programmatic integration (20).
3. **Information channels:** Only 16.3% of participants cited health facilities as their source of vaccine information, contrasting with Ghana's experience where facility-based education increased rotavirus awareness by 50% (21).

The 30% hesitancy rate observed mirrors national trends—a 2024 study reported a 28% refusal rate for rotavirus vaccines in Nigeria compared with 15% for established vaccines (22)—but may also reflect local cultural influences. In particular, Yoruba cultural beliefs (held by 71.4% of our sample) associating new vaccines with distrust, as documented in previous studies, may have further contributed to reluctance (23).

Recommendations for Policy and Practice

Our findings highlight three key strategies for addressing existing challenges. First, community-engaged education campaigns, facilitated by traditional and religious leaders, have the potential to bridge critical information gaps while addressing cultural concerns. By leveraging trusted figures within communities, these initiatives can enhance awareness and acceptance of essential healthcare practices.

Second, strengthening supply chain systems through improved cold storage and inventory management can significantly reduce disruptions caused by stockouts. Ensuring the availability of essential medical supplies will enhance the reliability of healthcare services and improve patient outcomes.

Finally, future research should employ mixed-methods approaches to gain deeper insights into the experiences of informal healthcare users and other vulnerable subgroups. A comprehensive understanding of these perspectives will inform more inclusive and effective healthcare interventions, ultimately fostering equitable access to essential services.

Conclusion

This study illuminates critical knowledge gaps and systemic challenges impeding optimal rotavirus vaccine uptake in Ilorin East LGA. While the Nigerian government's introduction of rotavirus vaccination represents an important public health advancement, realizing its full potential requires addressing the identified barriers through culturally sensitive, multi-sectoral interventions. The findings provide a foundation for developing targeted

strategies to improve vaccine acceptance and ultimately reduce preventable childhood mortality from rotavirus infection.

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