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NURSING MOTHERS' KNOWLEDGE, PERCEPTION AND ATTITUDE TOWARD CHILDHOOD VACCINATION IN ASABA, DELTA STATE

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ABSTRACT

Childhood vaccination remains one of the most effective public health interventions for preventing vaccine-preventable diseases and reducing childhood morbidity and mortality. However, increasing concerns about vaccine safety, misinformation, vaccine hesitancy and unequal access to health information continue to influence caregivers' immunization decisions. This study examined nursing mothers' knowledge, perceptions and attitudes toward childhood vaccination in Asaba, Delta State, Nigeria, with particular attention to the role of health communication in shaping vaccination behaviours. A qualitative research design was adopted, involving seven focus group discussions with 56 nursing mothers and eight key informant interviews with healthcare workers across four healthcare facilities in Asaba. Data were collected through semi-structured interview guides and analysed using thematic analysis. The findings revealed that healthcare workers and antenatal services constituted the most trusted sources of vaccination information, although mothers also obtained information from radio, television, social media, community outreach programmes and religious institutions. While participants generally demonstrated positive attitudes toward childhood vaccination and acknowledged its protective benefits, notable variations existed in their knowledge of specific vaccines, immunization schedules and vaccine-preventable diseases. Positive perceptions of vaccination were strengthened by trust in healthcare professionals but were moderated by concerns regarding side effects, misinformation, rumours of infertility and family influence. Furthermore, practical constraints such as transport costs, work commitments and distance to healthcare facilities affected vaccine compliance despite favourable attitudes. Anchored on the Health Belief Model and the Theory of Planned Behaviour, the study concludes that vaccine acceptance is shaped by the interaction of knowledge, trust, perceptions, social influence and structural factors. The study advances contemporary understanding of maternal vaccination behaviour by demonstrating that effective immunization communication must move beyond information dissemination to fostering trust, countering misinformation and addressing contextual barriers to vaccine uptake.

Keywords: *Childhood Vaccination, Vaccine Confidence, Health Communication, Nursing Mothers, Vaccine Hesitancy, Maternal Attitudes, Immunization Uptake.*

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Introduction

Childhood vaccination is one of the most effective public health interventions for preventing infectious diseases and reducing childhood morbidity and mortality. Through immunization, children develop protection against vaccine-preventable diseases such as measles, poliomyelitis, tuberculosis, diphtheria, tetanus and hepatitis. Despite the significant contribution of vaccination to child survival and disease prevention, achieving optimal childhood immunization coverage remains a challenge in many developing countries, including Nigeria. This challenge is not determined solely by the availability of vaccines and immunization services but is also influenced by caregivers' knowledge, perceptions, attitudes and confidence in vaccination. Mothers play a central role in decisions concerning their children's health, particularly during infancy and early childhood when routine immunization is essential. Their understanding of the purpose of vaccines, the diseases they prevent, recommended vaccination schedules and possible side effects can influence whether they initiate and complete their children's immunization. Adedire et al. (2021), in their study of maternal knowledge, attitudes and perceptions of childhood routine immunization in Osun State, Nigeria, highlighted the importance of understanding mothers' knowledge and views in promoting childhood vaccination. Similarly, Adeyanju and Betsch (2024) found that mothers' vaccination decisions in Nigeria were shaped by several considerations, including confidence in vaccine safety, religious beliefs, family influence and competing daily responsibilities.

Vaccine hesitancy, which involves delaying or refusing vaccination despite the availability of vaccination services, remains an important public health concern. MacDonald and the SAGE Working Group on Vaccine Hesitancy (2015) explained that vaccine hesitancy is complex and context-specific, influenced by factors such as confidence, complacency and convenience. In the context of childhood immunization, concerns about adverse effects, cultural and religious beliefs, misinformation and distrust of healthcare institutions may contribute to uncertainty among mothers. Consequently, positive attitudes towards vaccination do not always translate into consistent attendance for scheduled immunization. Health communication is particularly important in shaping mothers' knowledge and attitudes towards childhood vaccination. It involves the use of appropriate communication strategies and channels to

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provide health information improve understanding and encourage positive health behaviours. In immunization programmes, communication takes place through interpersonal interactions with healthcare workers, antenatal and postnatal counseling, mass media, social media, community campaigns and other forms of public engagement. Healthcare workers are especially important because mothers often depend on them for information about vaccine benefits, safety, schedules and possible reactions. Research by Oku et al. (2017) found that caregivers in Nigeria received vaccination information through health facilities, media outlets and community announcements, including messages shared in churches, mosques and markets. The study also identified long waiting times and negative health worker attitudes as factors that could affect the communication experience of caregivers.

In Nigeria, childhood immunization is delivered through routine vaccination programmes supported by government and public health agencies. Strategies such as antenatal and postnatal health education, immunization counseling, public awareness campaigns and community outreach are used to encourage parents and caregivers to vaccinate their children. Nevertheless, concerns about vaccine safety, misinformation, family influence and practical difficulties in accessing healthcare services continue to shape mothers' vaccination experiences. These challenges make it necessary to understand not only whether mothers accept childhood vaccines but also what they know about vaccination, how they perceive its benefits and risks, and the attitudes that influence their decisions. Asaba, the capital of Delta State, has several healthcare facilities offering routine childhood immunization services. However, the availability of these services does not automatically translate into uniform levels of knowledge, positive perceptions or consistent vaccination practices among nursing mothers. Differences in information exposure, personal experiences, family influence and interactions with healthcare providers may shape how mothers understand and respond to childhood vaccination. Understanding these issues within the local context is essential for developing relevant health communication approaches and improving immunization uptake.

Against this background, this study examines nursing mothers' knowledge, perceptions and attitudes towards childhood vaccination in Asaba, Delta State. It focuses on their understanding of childhood vaccines, their

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views about vaccine benefits and safety, and the factors that shape their attitudes towards immunization. By exploring these issues, the study seeks to provide insights that can inform more responsive health communication strategies, strengthen vaccine confidence and support improved childhood immunisation uptake.

Objectives

1. To explore nursing mothers' knowledge and understanding of childhood vaccination, including its benefits, importance, recommended schedules and possible side effects.
2. To examine nursing mothers' perceptions of childhood vaccination, particularly their views on vaccine safety, effectiveness and the factors shaping their confidence or concerns.
3. To explore nursing mothers' attitudes towards childhood vaccination and the factors influencing their willingness to initiate and complete their children's immunization schedules.

Literature Review

Knowledge is an important factor influencing the acceptance and utilization of childhood vaccination services. It encompasses an individual's understanding of the purpose, benefits, safety, timing and importance of vaccines. Among nursing mothers, adequate knowledge involves understanding the diseases vaccines prevent, the recommended immunization schedule, the importance of completing vaccine doses and possible reactions following vaccination. Such knowledge enables mothers to make informed decisions about their children's health and encourages participation in routine immunization programmes. In Nigeria, Adedire et al. (2021), in their study of maternal knowledge, attitudes and perceptions of routine childhood immunization in Osun State, highlighted the importance of maternal awareness and understanding in promoting vaccination. Similarly, Oku et al. (2017) observed that communication between healthcare workers and caregivers plays an important role in improving mothers' understanding of childhood vaccination and encouraging participation in immunization activities.

However, knowledge extends beyond awareness of vaccine availability to understanding why vaccines are administered at particular ages, the consequences of missed doses and the need to complete the recommended schedule. A mother may

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recognize that vaccination protects children against diseases but have limited knowledge of specific vaccines, the illnesses they prevent or the timing of subsequent doses. Health communication contributes to addressing these knowledge gaps through antenatal and postnatal counseling, immunization health talks, radio and television programmes, social media and community-based health education. Healthcare workers are particularly important in this process because they provide mothers with opportunities to ask questions and receive accurate explanations. Adeyanju and Betsch (2024), in their qualitative study of vaccination decision-making among Nigerian mothers, identified healthcare workers' recommendations and exposure to health information as important influences on maternal vaccination decisions. This underscores the importance of clear, credible and accessible information in strengthening mothers' knowledge and supporting informed childhood vaccination decisions (Obukoadata et al., 2024).

Perception refers to the way individuals receive, interpret and assign meaning to information and experiences. In the context of childhood vaccination, it concerns how nursing mothers understand and evaluate the benefits, safety, effectiveness and possible risks of immunization. These perceptions are shaped by existing knowledge, personal experiences, beliefs, cultural values, social relationships and information received from healthcare providers and other sources. Positive perceptions generally develop when mothers consider vaccines safe, beneficial and necessary for protecting children against preventable diseases (Godsgift & Obukoadata, 2008). Such views may be strengthened by successful vaccination experiences, recommendations from trusted healthcare workers and clear explanations of vaccine benefits. Conversely, fear of adverse reactions, unpleasant experiences, conflicting information and rumours about vaccine safety may create negative perceptions. Consequently, mothers may acknowledge the importance of immunization while expressing concerns about particular vaccines or their possible effects. MacDonald and the SAGE Working Group on Vaccine Hesitancy (2015) explain that vaccine hesitancy is influenced by confidence, complacency and convenience, suggesting that reluctance does not always mean outright rejection but may involve delaying doses or seeking further reassurance. Larson et al. (2014) similarly emphasize the importance of trust, social experiences and the wider information environment in shaping confidence in vaccines.

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In Nigeria, Adeyanju and Betsch (2024) found that mothers' vaccination decisions were influenced by trust in health institutions, family support, previous experiences and exposure to health information. Oku et al. (2017) also highlighted the importance of caregivers' experiences of vaccination communication, particularly their interactions with healthcare workers. These findings suggest that mothers' perceptions are shaped not only by the information they receive but also by how it is communicated and the credibility of its source. The increasing use of digital and social media has further complicated this information environment by providing opportunities for both credible health information and the circulation of rumours and unverified claims. Chou et al. (2018) explain that social media can influence public understanding of health issues through the rapid spread of information and misinformation. For nursing mothers, exposure to conflicting messages may create uncertainty, particularly when online claims contradict information received from healthcare workers. Understanding their perceptions therefore requires attention to their experiences, social influences, information sources and the level of trust they place in vaccination messages.

Obukoadata and Okoi (2025) posit that attitude is an individual's favourable or unfavourable evaluation of an object, issue or behaviour. In relation to childhood vaccination, it reflects mothers' feelings, beliefs and general disposition towards immunization. A positive attitude may be expressed through willingness to vaccinate, confidence in vaccine benefits and commitment to recommended immunization schedules, while a negative attitude may manifest as reluctance, fear, distrust, delayed vaccination or refusal. Attitudes are closely connected to knowledge and perception, as mothers who understand the protective benefits of vaccines and consider them safe may develop favourable views towards immunization. However, knowledge alone does not always guarantee positive attitudes. Personal experiences, family opinions, religious and cultural beliefs, fear of side effects and the conduct of healthcare workers may also influence mothers' responses. The Theory of Planned Behaviour explains these influences through three factors: attitude, subjective norms and perceived behavioural control (Ajzen, 1991). In this context, subjective norms reflect the influence of spouses, relatives, friends, religious leaders and healthcare workers, while perceived behavioural control concerns mothers' ability to access vaccination services and complete their

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children's immunization schedules despite challenges such as transport costs, work commitments, distance and waiting times.

Empirical studies in Nigeria demonstrate that maternal attitudes and vaccination decisions are influenced by knowledge, communication and social circumstances. Adedire et al. (2021) examined maternal knowledge, attitudes and perceptions of routine childhood immunization in Osun State, highlighting the relevance of these factors to immunization programmes. Adeyanju and Betsch (2024), in their qualitative study of vaccination decision-making among Nigerian mothers, identified healthcare workers' recommendations, family support, previous experiences, trust and exposure to health information as important influences on vaccination decisions. Similarly, Oku et al. (2017) examined caregivers' perceptions and experiences of childhood vaccination communication strategies in Nigeria, drawing attention to the role of communication in improving understanding and participation in immunization programmes. These studies suggest that mothers' attitudes are shaped by more than individual willingness; they also reflect social influences and experiences with healthcare services. Importantly, positive attitudes do not always result in timely or complete vaccination, as mothers may miss appointments because of work commitments, transport difficulties, a child's illness and other competing responsibilities.

Although existing studies (Obukoadata et al., 2021) provide useful evidence on maternal knowledge, perceptions, attitudes and childhood vaccination in Nigeria, there remains a need for context-specific qualitative understanding of how nursing mothers interpret vaccination information and how these factors are expressed in their everyday experiences in Asaba, Delta State. The present study addresses this geographical and contextual gap by exploring mothers' understanding of childhood vaccination, their perceptions of vaccine benefits and safety, and their attitudes towards immunization. Through focus group discussions with nursing mothers and key informant interviews with healthcare workers, the study provides insights into the experiences and perspectives that shape childhood vaccination decisions.

Theoretical Framework

This study is anchored on the Health Belief Model (HBM), originally developed by Rosenstock (1966) and subsequently expanded by scholars, including Becker (1974). The model explains how individuals' beliefs and perceptions about health risks and

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preventive actions influence their health-related decisions. It comprises six major constructs: perceived susceptibility, perceived severity, perceived benefits, perceived barriers, cues to action and self-efficacy. Applied to childhood vaccination, perceived susceptibility and severity relate to mothers' understanding of their children's vulnerability to vaccine-preventable diseases and the possible consequences of remaining unprotected. Perceived benefits concern their belief in the protective value of vaccines, while perceived barriers include concerns about side effects, misinformation, transport difficulties, cost, waiting time and distrust of healthcare providers. Cues to action may include advice from healthcare workers, antenatal health talks, radio announcements, social media messages and immunization reminders. Self-efficacy reflects mothers' confidence in their ability to follow immunization schedules, attend appointments and seek clarification when necessary. The model is relevant because it explains how mothers' knowledge and perceptions of childhood diseases, vaccine benefits and possible barriers influence their attitudes towards immunization and decisions to accept, hesitate or delay vaccination.

The study is also guided by the Theory of Planned Behaviour (TPB), developed by Ajzen (1991), which explains how attitudes, social expectations and perceived control influence behavioural intentions. The theory identifies three major factors: attitude towards the behaviour, subjective norms and perceived behavioural control. In this study, attitude reflects mothers' positive or negative evaluation of childhood vaccination, while subjective norms refer to the influence of significant individuals and groups, including husbands, relatives, friends, religious leaders, community members and healthcare workers. Perceived behavioural control concerns mothers' belief in their ability to access immunization services and complete their children's vaccination schedules despite challenges such as distance, transport costs, work responsibilities and inconvenient clinic arrangements. The theory is relevant because it recognizes that vaccination decisions are shaped not only by individual knowledge and beliefs but also by social influences and practical circumstances. Together, the Health Belief Model and Theory of Planned Behaviour provide a useful foundation for understanding how nursing mothers' knowledge, perceptions, attitudes and social experiences influence their responses to childhood vaccination.

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Methodology

This study adopted a qualitative research design to explore nursing mothers' knowledge, perceptions and attitudes towards childhood vaccination in Asaba, Delta State, Nigeria. The study was conducted at four selected health facilities: Federal Medical Centre (FMC), Asaba; Asaba Specialist Hospital; Umuagu Primary Health Care Centre; and Group Medical Hospital. The study population comprised nursing mothers attending immunization services at the selected facilities and healthcare workers involved in childhood immunization, maternal and child health, and health education. Facility records indicated a combined monthly attendance of 914 nursing mothers across the four facilities. Using purposive sampling, 64 participants were selected, comprising 56 nursing mothers and eight healthcare workers. The nursing mothers participated in seven focus group discussions (FGDs), with eight participants in each group. Two FGDs were conducted at FMC Asaba, Asaba Specialist Hospital and Umuagu Primary Health Care Centre, respectively, while one was conducted at Group Medical Hospital, reflecting its comparatively lower attendance. Eight healthcare workers, two from each facility, participated in key informant interviews (KIIs).

Eligible nursing mothers were those attending the selected facilities who had experience with childhood vaccination and were willing to participate. Healthcare workers were selected based on their involvement in immunization, maternal and child health, health education or related services. Individuals who did not meet the eligibility criteria or declined to participate were excluded. Data were collected using semi-structured FGD and KII guides designed to explore participants' knowledge of childhood vaccination, perceptions of vaccine benefits and risks, attitudes towards immunization, sources of vaccination information, and factors influencing vaccination decisions. The FGDs elicited mothers' experiences, beliefs, concerns and interactions with vaccination information, while the KIIs explored healthcare workers' perspectives on communication practices, common concerns among mothers, service-related challenges and factors affecting immunization uptake. Participants' responses were documented and, where permission was obtained, audio-recorded and transcribed for analysis. The data were analyzed thematically through familiarization with the transcripts, coding relevant data, developing and reviewing themes, and interpreting the findings in relation to the study objectives. Accounts from the FGDs and KIIs were compared to identify

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shared patterns and differences, while divergent perspectives were retained to represent the range of participants' experiences. The sample size was considered appropriate for the qualitative design, with data saturation guiding the adequacy of the collected information. For ethical concerns, discussants and key Informant Interviewees are labelled as A1-A8, B1-B8, C1-C8, D1-D8, E1-E8, F1-F8, G1-G8 and KII1-KII8.

Results and Discussion

The analysis of seven focus group discussions (FGDs) involving 56 nursing mothers and eight key informant interviews (KIIs) with healthcare workers revealed five interconnected areas: sources of vaccination information, knowledge of childhood vaccines, perceptions of vaccine benefits and safety, attitudes towards vaccination, and factors influencing acceptance. Overall, participants expressed favourable views towards childhood vaccination, although differences in knowledge, concerns about side effects, misinformation, family influence and practical barriers were evident. Healthcare workers emerged as important sources of vaccination information, particularly during antenatal care and immunization visits. Participants also identified radio, television, social media, churches, schools, markets and community outreach activities as sources of information. One participant explained, *"Health workers come to the market, and I have met them several times at Ogbogonogo Market. They go to markets telling people about immunization"* (FGD participant A2). Another participant described the widespread availability of vaccination messages: *"The information is everywhere. They talk about it even in church, radio, schools. Our children come back to tell us what they said. They talk about all these things"* (FGD participant D6).

Healthcare workers corroborated these accounts, explaining that vaccination messages were communicated at different stages of maternal and child healthcare. One informant stated, *"These messages come to them from their antenatal days to their postnatal days, and even when they come for immunization. We get it across to them, even to the churches. We organize awareness campaigns. These messages get to mothers"* (KII2).Although mothers generally understood that vaccination protects children against diseases, their knowledge of specific vaccines and the diseases they prevent varied. One participant admitted, *"I only bring my child's card, and the nurses know the vaccine to give. I don't know their names"* (FGD participant A2). In contrast, another participant stated, *"I know*

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BCG, polio, yellow fever vaccine, measles vaccine" (FGD participant B4). A healthcare worker similarly observed, *"Mothers are aware, they have that knowledge that these vaccines help protect their children against illness. But the problem is that they might not know the particular vaccine that stops the particular illness"* (KII7).

Participants generally expressed positive perceptions of childhood vaccination and recognized its importance in protecting children's health. Trust in healthcare workers featured prominently in their accounts. One mother explained, *"If the vaccines were not safe, the health workers would not be giving them to our children. I had my baby a few days ago and I am here to give my baby this first vaccine because I know it will save my baby, make her healthy, and protect her from infections and other diseases"* (FGD participant C1).However, positive perceptions coexisted with concerns about possible side effects. One participant recalled, *"Yes, the vaccines are okay, but sometimes the fever they get discourages me and I feel, ah, why will this happen? I remember when my child took one of the vaccines, the injection site became swollen. I did not know what to do. It was my friends who encouraged me to make sure I completed the vaccination timetable for my child"* (FGD participant E6). Another mother described her apprehension before vaccination: *"I heard so many things that even when I was coming for this postnatal visit, I was skeptical about giving my child the vaccine because of different things I heard about the side effects"* (FGD participant C6).

Misinformation also featured in participants' accounts. A mother reported, *"Yes, sometimes you hear stories about vaccines causing problems. I have even heard that some vaccines can cause infertility, especially in female children"* (FGD participant F4). Healthcare workers described similar concerns about rumours and conspiracy beliefs. One informant explained that some mothers believed children were being used for experiments or that vaccination was intended to reduce the Black population (KII4). Another reported that some husbands discouraged their wives from attending immunization after showing them videos alleging harmful vaccine effects (KII8).

Despite these concerns, healthcare workers described vaccine acceptance among mothers attending the selected facilities as generally high. One informant observed, *"Yes, nursing mothers keep to their schedules, their immunization schedules. Even if there are some people that miss, it doesn't happen*

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much. Majority of them keep to their immunization dates, and we are impressed by this to an extent" (KII3). Nevertheless, practical and social barriers remained. A healthcare worker explained that some mothers living far from health facilities lacked transport money or could not leave their businesses to attend immunization sessions. The informant stated, *"We take the vaccine to them. We organize outreach in those areas to make sure that these vaccines get to everyone"* (KII5). Another participant identified work as an obstacle, stating, *"Most times, my job hinders me from attending"* (FGD participant G7).

Implications of the Findings

The findings indicate that nursing mothers attending the selected facilities in Asaba generally recognized the importance of childhood vaccination, although their knowledge of individual vaccines varied. The distinction between general awareness and specific knowledge is important: a mother may understand that immunization protects children without knowing the purpose of every vaccine administered. Participant A2's reliance on nurses to identify the appropriate vaccines illustrates this difference. One possible explanation is that mothers may prioritize attending appointments and following health workers' instructions, while the extent of vaccine-specific education they receive varies. The findings suggest that health education should explain not only when children should be vaccinated but also the purpose and benefits of individual vaccines. Healthcare workers and antenatal and immunization services were prominent sources of information. The findings also indicate that community channels extend communication beyond health facilities. This corresponds with Oku et al. (2017), whose qualitative research examined caregivers' and health workers' experiences of childhood vaccination communication in Nigeria. It is also relevant to Adedire et al. (2021), who investigated maternal knowledge, attitudes and perceptions concerning routine childhood immunization in Osun State. The prominence of healthcare workers in the present study may be explained by their direct contact with mothers and their perceived professional authority. Their explanations can also provide opportunities for questions and reassurance. However, participant A5's account in the dissertation that more detailed teaching occurred during immunization visits than during antenatal care suggests that exposure does not automatically produce comprehensive understanding. Communication should therefore be consistent across antenatal, postnatal and immunization services.

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The generally positive perceptions of vaccination were closely associated with trust in healthcare workers and recognition of the benefits of protecting children against preventable diseases. Participant C1's willingness to bring her newborn for vaccination despite feeling physically weak illustrates how perceived benefits and professional trust can motivate acceptance. This finding is consistent with MacDonald and the SAGE Working Group on Vaccine Hesitancy (2015), who identified confidence, complacency and convenience as important considerations in understanding vaccine hesitancy. Trust may be particularly influential where mothers lack detailed knowledge of individual vaccines and rely on health professionals for guidance.Nevertheless, concerns about fever, swelling and other possible reactions demonstrate that favourable attitudes do not eliminate anxiety. Participant E6's account shows how an actual experience of swelling, coupled with uncertainty about what to do, can create concern. Her friends' encouragement helped her remain committed to completing the vaccination schedule. This suggests that mothers interpret vaccination through both health information and personal experiences. Immediate reactions may be more noticeable and emotionally troubling than the future diseases vaccination is intended to prevent. Clear explanations of expected reactions, appropriate home care and warning signs requiring medical attention may help mothers respond confidently rather than rely solely on informal advice.

The reports of rumours about infertility and alleged experimentation reveal another challenge for health communication. These claims were reported as circulating beliefs, not established facts. Their presence suggests that mothers may encounter conflicting messages through social networks and digital media. The finding is consistent with the wider concerns about vaccine confidence discussed by MacDonald and the SAGE Working Group on Vaccine Hesitancy (2015). A possible explanation for the persistence of such rumours is that claims involving fertility and children's long-term wellbeing provoke strong emotional responses. When information comes from a trusted relative or spouse, it may compete with professional advice. Health workers therefore need to address specific concerns respectfully, explain the evidence in accessible language and create opportunities for mothers to ask questions without fear of ridicule. Family influence further demonstrates that vaccination decisions do not always rest with mothers alone. KII8's account of husbands discouraging immunization illustrates how

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partners can influence mothers' actions through the information they share and the authority they exercise within households. This finding can be interpreted through Ajzen's (1991) Theory of Planned Behaviour, particularly the concept of subjective norms, which recognises the influence of significant others on behavioural intentions. Involving fathers and other influential family members in vaccination education may therefore strengthen support for immunization.

The findings also distinguish vaccine acceptance from the practical ability to attend appointments. Although healthcare workers reported generally high acceptance, participants identified work commitments, transport costs and distance as barriers. Participant G7's account demonstrates that a missed appointment may result from competing responsibilities rather than unwillingness to vaccinate. This finding aligns with Oladepo et al. (2019), who examined Nigerian mothers' knowledge of routine childhood immunization and attitudes towards reminder text messages for promoting timely completion. It suggests that communication interventions are more effective when supported by reminders, accessible outreach services and convenient appointment arrangements. The Health Belief Model (Rosenstock, 1974) helps explain the findings through mothers' perceptions of vaccination benefits, concerns about side effects and cues to action provided by healthcare workers. The Theory of Planned Behaviour complements this explanation by highlighting the influence of attitudes, family expectations and perceived control over attendance. Together, these perspectives show that childhood vaccination behaviour involves more than knowledge or willingness alone.

These findings suggest that nursing mothers attending the selected facilities in Asaba were generally receptive to childhood vaccination, but acceptance existed alongside differences in knowledge, safety concerns, misinformation and practical challenges. The study reinforces the importance of trusted, clear and responsive health communication. Communication should be combined with respectful healthcare services, family engagement and practical support to help mothers complete their children's recommended immunization schedules.

Conclusion and Implications of the Findings

This study examined nursing mothers' knowledge, perceptions and attitudes toward childhood vaccination in Asaba, Delta State,

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with the aim of understanding how these factors shape childhood immunization decisions and practices. Drawing on evidence from seven focus group discussions involving 56 nursing mothers and eight key informant interviews with healthcare workers, the study provides important insights into the complex interplay between knowledge, perception, attitude, social influence and health communication in contemporary childhood vaccination behaviour. The findings indicate that while acceptance of childhood vaccination is generally high among nursing mothers in Asaba, vaccine-related decisions continue to be shaped by varying levels of knowledge, perceived risks, interpersonal influences and practical constraints.

Concerning the first objective, which sought to explore nursing mothers' knowledge and understanding of childhood vaccination, the findings reveal that participants possessed a considerable level of awareness regarding the importance of immunization and its role in protecting children from preventable diseases. However, this awareness did not always translate into detailed knowledge of specific vaccines, their functions, or the diseases they prevent. Many mothers trusted healthcare workers sufficiently to follow immunization schedules even when they lacked comprehensive scientific understanding of the vaccines administered. This finding reinforces the argument of Adedire et al. and Oku et al. that maternal knowledge is a significant determinant of immunization behaviour and that healthcare communication serves as an essential mechanism for strengthening such knowledge.

Conceptually, the findings extend current understanding of knowledge as a multidimensional construct. Knowledge in vaccination research should not merely be viewed as awareness of vaccine availability but as a continuum that ranges from basic awareness to informed comprehension of vaccine schedules, mechanisms and benefits. The study therefore contributes to the contemporary knowledge base by demonstrating that mothers can actively support childhood vaccination even when their technical understanding remains limited, especially where institutional trust exists. This finding refines prevailing assumptions in immunization scholarship and suggests that future studies should distinguish between general vaccine awareness and functional vaccine literacy when measuring maternal knowledge.

Regarding the second objective, which examined nursing mothers' perceptions of

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childhood vaccination, the study found that participants largely perceived vaccines as beneficial, protective and necessary for child survival. Trust in healthcare providers emerged as the strongest driver of positive vaccine perceptions, with mothers expressing confidence that health professionals would not recommend interventions capable of harming their children. At the same time, favourable perceptions coexisted with fears relating to vaccine side effects, including fever, swelling and discomfort after immunization. Some participants also reported exposure to misinformation linking vaccination to infertility, experimentation and other unsubstantiated health risks.

These findings strongly validate the assumptions of the Health Belief Model (HBM), which proposes that health behaviour is influenced by perceptions of susceptibility, severity, benefits and barriers. The mothers' willingness to vaccinate their children reflected a recognition of the benefits of immunization and a belief in children's vulnerability to vaccine-preventable diseases. Simultaneously, reported concerns about side effects and misinformation represent perceived barriers that may potentially weaken vaccine confidence. The study therefore confirms the enduring relevance of the HBM in explaining childhood vaccination decisions within developing societies. More importantly, it demonstrates that vaccine acceptance is not solely a product of scientific evidence but also an outcome of how individuals interpret, negotiate and internalize health information within their social and cultural environments.

The findings equally support contemporary vaccine confidence literature advanced by MacDonald and the SAGE Working Group on Vaccine Hesitancy, as well as Larson et al., who argue that trust remains central to immunization acceptance. The implication is that public health authorities can no longer rely exclusively on information dissemination strategies. Rather, contemporary vaccination campaigns must prioritize trust-building, dialogue, empathy and proactive responses to misinformation circulating through digital and interpersonal networks.

With respect to the third objective, which explored nursing mothers' attitudes toward childhood vaccination and the factors influencing their willingness to initiate and complete immunization schedules, the study found overwhelmingly positive attitudes among participants. Most mothers expressed a willingness to vaccinate their children and acknowledged vaccination as a parental responsibility necessary for protecting child

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health. Nevertheless, positive attitudes did not always guarantee uninterrupted compliance with vaccination schedules. Work commitments, transportation difficulties, distance to health facilities, family influence and competing socio-economic responsibilities sometimes hindered attendance despite favourable intentions.

This finding provides strong empirical support for the Theory of Planned Behaviour (TPB), which argues that behaviour results not only from personal attitudes but also from subjective norms and perceived behavioural control. The influence of husbands, relatives, friends and community members on vaccination decisions clearly reflects the role of subjective norms identified within the theory. Likewise, transportation costs, clinic accessibility and occupational constraints illustrate limitations in perceived behavioural control. The implication is that positive attitudes alone cannot guarantee behavioural outcomes. Successful immunization interventions must simultaneously address social influences and structural barriers that affect mothers' ability to translate intentions into action.

Beyond its theoretical relevance, the study advances contemporary scholarship on knowledge, perception and attitude by demonstrating that these variables should not be treated as independent constructs. Rather, they operate as interconnected dimensions of health decision-making. Knowledge influences perception; perception shapes attitude; and attitude interacts with social and environmental realities to determine actual vaccination behaviour. This integrated understanding contributes to the growing body of literature calling for multidimensional approaches to vaccine acceptance research rather than isolated examinations of single determinants.

The study also contributes to health communication scholarship by confirming that effective vaccination communication involves more than the transmission of information. The evidence suggests that communication is most effective when it creates trust, encourages dialogue, addresses uncertainty, counters misinformation and responds to the lived experiences of mothers. Healthcare workers emerged as the most credible communication agents in the vaccination ecosystem, underscoring the continuing importance of interpersonal communication even in an increasingly digital information environment.

These findings establish that nursing mothers in Asaba are generally disposed toward childhood vaccination, but their vaccination experiences are mediated by knowledge gaps, risk perceptions, misinformation, family

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influences and practical barriers. The study therefore concludes that improving childhood immunization outcomes requires an integrated approach that combines evidence-based health education, sustained community engagement, strengthened vaccine confidence, supportive family participation and accessible healthcare delivery systems. In an era increasingly characterized by information overload and vaccine misinformation, the future of childhood immunization depends not merely on the availability of vaccines but on the ability of public health systems to cultivate informed knowledge, positive perceptions and enduring trust among caregivers. Such trust remains the critical bridge between vaccine availability and successful immunization outcomes, and ultimately the foundation upon which sustainable childhood disease prevention and public health protection must rest.

In conclusion, the study demonstrates that childhood vaccination decisions among nursing mothers in Asaba are influenced by a dynamic interaction of knowledge, perception, attitude, trust, social influence and structural realities. Consistent with the propositions of Rosenstock (1966, 1974), Ajzen (1991), MacDonald and the SAGE Working Group on Vaccine Hesitancy (2015), and empirical studies by Adedire et al. (2021), Oku et al. (2017), and Adeyanju and Betsch (2024), the findings affirm that acceptance of childhood vaccination extends beyond awareness alone and is fundamentally shaped by trust, confidence, social support and access to quality health communication. The study therefore contributes to contemporary scholarship by demonstrating that knowledge, perception and attitude function not as isolated determinants but as interconnected dimensions of maternal health behaviour that collectively influence immunization outcomes. As vaccine misinformation continues to proliferate in digital and interpersonal communication spaces, strengthening vaccine literacy, sustaining public trust and promoting responsive health communication will remain indispensable to achieving improved childhood immunization coverage and safeguarding child health in Nigeria and similar developing context

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