

Challenges of Effective Children National Immunization Programme in Oko-ogba Community, Edo State, Nigeria

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ABSTRACT

Childhood immunization is crucial for protecting children from debilitating and life-threatening diseases. Despite its safety and efficacy, many barriers hinder full vaccination as recommended by the World Health Organization (WHO). Globally, millions of infants miss basic vaccinations, with about 64% of Nigerian children inadequately immunized. This paper examines the challenges of the national immunization program in Oko-Ogba community, Edo State, Nigeria; it also examined barriers like parental knowledge, income, belief system, sex and age of the child, and distance to health centers. Employing the health belief model, the study utilized a cross-sectional design with 364 participants, determined by Krejcie and Morgan's formula. Participants – women/caregivers in Oko-Ogba for at least six months, were sampled using convenient and simple random sampling for qualitative and quantitative research, respectively. Data collection involved semi-structured questionnaires and in-depth interviews. Pilot testing ensured questionnaire reliability. Analysis included descriptive statistics and thematic analysis. The study identified various hurdles preventing full immunization in the study area, stressing the need of coverage for child survival. Recommendations include improved planning, funding, training, and community involvement to enhance accessibility and quality of services at health facilities, ultimately increasing population willingness to seek immunization.

KEYWORDS:

Childhood, Child mortality, Immunization, Neonatal mortality, Vaccine hesitancy

Introduction

Childhood immunization plays a pivotal role in safeguarding children's health, reducing morbidity and mortality from vaccine-preventable diseases (VPDs), and enhancing overall population health (World Health Organization, 2020a). Vaccination not only protects individuals but also fosters herd immunity, reducing the transmission and incidence of infectious diseases in communities. Moreover, immunization programs offer significant economic benefits by curbing healthcare costs associated with disease treatment and productivity losses due to illness and disability (Tadesse, Deribew, & Woldie, 2009 cited in Bangura et al., 2020; WHO, 2020b).

Despite being one of the most effective public health interventions, childhood immunization remains pivotal in lowering child mortality and morbidity related to infectious diseases at minimal cost (Obasoha et al., 2018). Immunization prevents over 1.2 million infant deaths annually and is integral to achieving Sustainable Development Goal (SDG) number 3, aimed at reducing under-five mortality to fewer than 25/1000 live births by 2030 (WHO, 2010 cited in Bangura

et al., 2020). However, vaccine-preventable diseases continue to pose a significant threat, particularly in low-income countries, with Africa bearing a disproportionate burden of under-five mortality attributed to these diseases.

Globally, millions of children remain unvaccinated or under-vaccinated, resulting in preventable deaths annually (Mezen et al., 2023). Despite efforts to improve immunization coverage through initiatives like the Expanded Programme on Immunization (EPI), disparities persist, especially in rural areas (Adeloye et al., 2017). These challenges are compounded by factors such as poor access to healthcare facilities, limited awareness, and vaccine hesitancy (National Population Commission, 2013; World Health Organization, 2017).

In Nigeria, despite various interventions, immunization coverage remains suboptimal, particularly in rural communities (National Bureau of Statistics & UNICEF, 2022). Understanding the factors influencing childhood immunization rates in these settings is crucial for designing targeted interventions and improving vaccine coverage (Oldfield & Stewart, 2016). Therefore, this study focuses on the challenges of effective childhood immunization in Oko-Ogba Community, Edo State, Nigeria, aiming to identify barriers and inform strategies to enhance immunization coverage and protect the health of vulnerable children in rural areas. Against this backdrop, this paper provides answer to this overarching research question: What are the challenges that affect the full participation in immunization programme by residents in Oko-Ogba community, Edo State, Nigeria?

Challenges to Full Participation in Immunization Programme: A Review of the Literature

According to the World Health Organisation (2019), national immunization programmes are extensive activities done by governments to guarantee vaccination availability and uptake among children in their communities. These programmes usually include acquiring, distributing, and administering vaccinations by standardized schedules established by global health agencies such as the World Health Organization (WHO) and National Immunization Technical Advisory Groups (NITAGs). Furthermore, immunization programmes use surveillance systems to track vaccination coverage, adverse events, and disease incidence. Despite the success of immunization efforts, various constraints limit the efficacy of national immunization programmes for children, particularly in low- and middle-income countries. These difficulties have several aspects, including:

Access and Coverage: Limited access to vaccinations and immunization services continues to be a serious obstacle, especially in distant or underdeveloped populations. Geographic constraints, limited healthcare infrastructure, and socioeconomic inequities all contribute to differences in immunization coverage, making particular groups prone to VPDs (Larson et al., 2015).

Vaccine Hesitancy: Vaccine hesitancy, defined as unwillingness or refusal to vaccinate despite vaccine availability, is an increasing hazard to immunization

programmes. Misinformation, distrust of vaccinations or healthcare practitioners, and complacency over VPDs can contribute to vaccine hesitation among carers and communities (Larson et al., 2015).

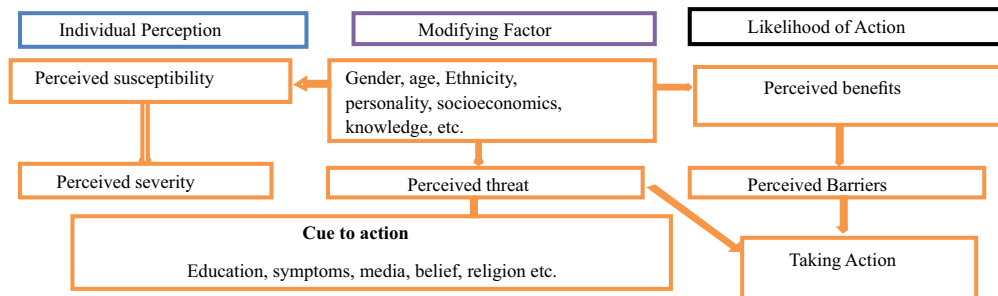
Weaknesses in health systems: This includes inadequate infrastructure, supply chain inefficiencies, and manpower shortages, present operational obstacles for immunization programmes, poor resources for vaccine procurement, storage, and distribution, as well as poor training and supervision of healthcare professionals, might jeopardise the quality and breadth of immunization services (WHO, 2020a).

Community Engagement and Communication: Effective communication and community engagement are critical for increasing trust in immunization programmes and reducing vaccine reluctance. However, disinformation, rumours, and cultural or religious beliefs can erode public trust in vaccinations. Improving communication methods and interacting with communities are crucial for increasing vaccination acceptability and uptake (Dube et al., 2013).

Socioeconomic and Cultural Factors: Poverty, education, and cultural attitudes all impact immunization rates and coverage. Disparities in healthcare access, as well as cultural norms and vaccination beliefs, can all influence vaccine acceptability and use. Addressing socioeconomic and cultural obstacles is critical to ensuring equal access to immunization programmes (Wiysonge et al., 2012).

Theoretical Framework

The Health Belief model is the theory that helped to shed light on this research. The health belief paradigm was initially put forth by Rosenstock (1966) and further developed in the 1970s and 1980s by Becker and Rosenstock (1984). This model was the first to analyze health behavioral choices, highlighting how these choices result from people's biased assessments of actions that could be harmful to their health. The model posits that while beliefs about possible actions determine the specific plan of attack, perceived threats drive people to act. This theory is based on the idea that people's views influence the actions or behaviors they take regarding their health. People are likely to act in response to personal danger or risk only if the benefits of doing so outweigh the barriers, whether actual or imagined. It is also essential to be able to respond. The idea that mothers and caregivers support immunization because they want to avoid sickness or, on the other hand, recover if they are already ill, and the belief that a particular health action will prevent or cure illness make this theory pertinent to this research. This theory explains why some women/caregivers do not comply with the immunization program and the reasons why some mothers and caregivers do so to some extent. However, the health belief model has limitations regarding mothers'/caregivers' attitudes, beliefs, or other personal factors influencing a person's acceptance of a health practice, such as vaccination; environmental or economic factors that may prohibit full vaccination in children; and problems due to a lack of access to equal amounts of information on vaccine-preventable diseases, among others. This theory is further explained using figure 1 illustrated below.

Figure 1: Structure of the Health Belief Model

Source: The Health Belief Model's Application, 2021

Additionally, Health Belief Model (HBM) can be used to understand the challenges affecting the full participation of the immunization program among residents in Oko-Ogba Community. The HBM suggests that people's health-related behaviors are influenced by their perceptions of the severity of a health problem, their susceptibility to it, the benefits of taking action to prevent it, and the barriers to action. Applying this model to the challenges of immunization participation in Oko-Ogba Community:

Perceived Susceptibility: Residents may perceive their children as less susceptible to vaccine-preventable diseases (VPDs) due to factors such as low disease prevalence or misconceptions about the effectiveness of vaccines. This perception can lead to complacency and a lack of motivation to participate fully in the immunization program.

Perceived Severity: Residents may underestimate the severity of VPDs, leading them to downplay the importance of immunization. Without a clear understanding of the potential health consequences of VPDs, they may not prioritize vaccination for their children.

Perceived Benefits: Even if residents acknowledge the importance of immunization, they may not perceive the benefits of vaccination as significant enough to overcome the perceived barriers. For example, they may believe that their children are already protected or that the benefits of vaccination do not outweigh the perceived risks or inconvenience.

Perceived Barriers: Various barriers can hinder full participation in the immunization program. These barriers may include logistical challenges such as distance to health centers, transportation costs, or inconvenient clinic hours. Additionally, cultural beliefs, misconceptions about vaccines, fear of side effects, and lack of trust in healthcare providers can also act as barriers to immunization.

Cues to Action: Cues to action, such as reminders from healthcare providers, community outreach efforts, or educational campaigns, can motivate residents to overcome barriers and participate in the immunization program. However, if these cues are lacking or ineffective, residents may be less likely to take action.

By addressing these components of the Health Belief Model and implementing strategies to address residents' perceptions and barriers, healthcare providers and policymakers can work to improve immunization participation rates in Oko-

Ogba Community. This may include targeted education campaigns to increase awareness of the importance of immunization, addressing misconceptions and concerns about vaccines, improving access to vaccination services, and providing support to overcome logistical barriers.

Methodology

The study employed a cross-sectional research design to explore the challenges of effective children's national immunization programs, particularly in Oko-Ogba Community, Edo State. This design was chosen due to the diverse socio-economic backgrounds of the respondents involved. The study area had a population of 4,105 according to the National Population Census of 2006, with a projected population of 6,912 based on an annual growth rate of 3.31% as of 2022. The sample size of 364 was determined using Krejcie and Morgan's sample size formula. Out of the calculated sample size, 347 women were surveyed quantitatively, while 17 participants underwent qualitative in-depth interviews.

The participants were residents (women/caregivers) of Oko-Ogba Community who had resided there for at least six months. The primary target population comprised women and caregivers aged 18 years or older, eligible to vaccinate their children under the Children's National Vaccination Programme. Informed consent was obtained from participants before their involvement in the study. Exclusions from the study were individuals under 18 years old, those lacking direct connection or acquaintance with the immunization program, and those unable or unwilling to give informed consent.

Convenient sampling was used for the qualitative study, selecting participants accessible within the community, while simple random sampling was employed for the quantitative study. The 17 participants for the qualitative study included healthcare personnel, community leaders, influencers, nursing mothers/caregivers, and women community leaders. For the quantitative study, participants were randomly selected during visits to the Oko primary health center.

A semi-structured questionnaire and the indepth interview guide were used as the research instruments, consisting of socio-demographic questions and inquiries about the Challenges of Effective Children National Immunization Programme. The research instruments were self-administered with the assistance of trained research assistants. Face-to-face interactions were conducted in the local Benin language or Pidgin English to accommodate participants with limited formal education.

Pilot testing of the questionnaires was conducted to ensure reliability, with a Cronbach Alpha value of 0.8 indicating high sufficiency. Content validity was ensured through a strong theoretical framework and consultation with subject-matter experts. Construct validity was confirmed by validating the measuring instruments through statistical techniques like factor analysis. Data analysis involved descriptive statistics, thematic analysis of qualitative data, and presentation using tables, charts, and graphs.

Analysis and Findings

The section below contained the results which was analyzed from primary data of this research.

Analysis and Findings from Quantitative Data

Table 1: Challenges that affect the full participation of immunization programme

Variable/Question	Responses	Frequency	Percentage
What are the major barriers to immunization in your community?	Income of parents/caregivers	121	34.9
	Distance to health centre	72	20.7
	Belief system (Parent's /caregivers' religion)	118	34.0
	Time of immunization exercise	36	10.4
Total		347	100

Results of the analysis in Table 1 shows that 121 respondents, representing 34.9%, stated that the challenges affecting women or caregivers' participation in the immunization program are the income of parents or caregivers. Additionally, 72 respondents, representing 20.7%, believe that the distance to the health center is a challenge to full participation in the immunization program in Oko-Ogba Community. Furthermore, 118 respondents, representing 34%, stated that the belief system, specifically the religious affiliation of parents or caregivers, is a challenge to full participation in the immunization program in Oko-Ogba Community. Meanwhile, 36 respondents, representing 10.4%, mentioned that the timing of the immunization exercise is a challenge to full participation in the immunization program in Oko-Ogba Community.

Table 2: Other factors that affect the effectiveness of immunization programme

Variable	Responses	Frequency	Percentage
Which of these do you think are other reasons for not attaining full immunization of your child(ren) in this community?	Sex of a child	83	23.9
	Trust on the vaccines	92	26.5
	High level of illiteracy	108	31.1
	Age of the child	59	17.0
	Others	5	1.4
Total		347	100

To identify additional reasons for non-compliance with full participation in immunization programs in Oko-Ogba Community, participants were further asked to state their responses regarding other factors affecting the effectiveness of immunization programs in Oko-Ogba Community. The analysis results indicate that out of the 347 participants in the quantitative study, 83 respondents, representing 23.9%, cited the sex of the child as affecting the participation of women or caregivers in full participation in the immunization program in Oko-Ogba Community. Additionally, 92 respondents, representing 26.5%, mentioned that trust in the vaccines affected the full participation of women or caregivers in the immunization program in Oko-Ogba Community. Furthermore, 108 respondents, representing 31.1%, stated that a high level of illiteracy affects the

effectiveness of the immunization program in Oko-Ogba Community. Moreover, 59 respondents, representing 17%, mentioned that the age of the child affected full participation in the immunization program in Oko-Ogba Community, while 5 respondents, representing 1.4%, stated that there are other factors not listed that affected the residents of Oko-Ogba Community from participating fully in the immunization program.

Findings from Qualitative Data Analysis

Qualitative data gathered in the course of this study shows that quite a number of factors are act as challenges to full participation of immunization programme in the study area. Some of the respondents reported that religious belief affected the participated of women and caregivers in immunization programme. One of the interviewees simply put it thus:

Due to my religious beliefs and ethnicity, my husband and his family have always prevented me from taking my children to the primary health centre for vaccinations after giving birth. He has always preferred a female traditional birth attendant to care for me during the delivery of all three of my children, which has caused me great concern. I do not feel entirely at ease with our religious beliefs and ethnicity because if my children become sick, I immediately think of the fact that they were not inoculated, which makes me feel threatened (Hajia.H./ Married/28 years/Muslim/Hausa/trader).

Another interviewee observed that:

My grandparents have always told us that there is no need to give our children any vaccinations. They generally tell us that our ancestors are our children's best hope of survival. I don't feel secure defying our elders' customs and recommendations, and my children have never had a persistent condition or illness that defies ordinary treatments (Osayuwa/Married/44 years/ATR/Benin).

Data gathered from the field revealed that despite the availability of child vaccinations in the Oko-Ogba community, logistical and financial challenges hinder some mothers from accessing the Oko primary healthcare facility for immunizations, primarily due to the distance and associated costs, including expenses for vaccination cards and medication. This highlights poverty as a significant barrier to vaccination uptake in the community. One of the interviewee simply put it thus:

Even though vaccinations for children are accessible in the Oko-Ogba community, several obstacles still prevent some mothers from bringing their children to the Oko primary healthcare facility. I occasionally find getting my children to the PHC for their immunizations challenging because it is quite a distance from my house and it is expensive for me to transport them to the Oko primary health centre every time. Even before the vaccination process begins, one is initially required to pay for a vaccination card and a bottle of paracetamol. I can state that some of the mothers in

this community would not be able to cover all these expenses. In light of this, I can argue that a big obstacle to a child receiving vaccinations is poverty (Mrs M.A./Separated/42 years/formal employment/Benin).

Some respondents stated that they hesitated to vaccinate their daughters due to concerns about potential unknown side effects and doubts about the effectiveness of vaccines. They worry that vaccination might negatively impact their daughter's future productivity and question the benefits of immunizations administered to newborns. Comparing the longevity of past generations to modern children who receive vaccinations, they challenge the assumption that early deaths in contemporary society are solely attributable to pharmaceuticals given to children over time as two of the interviewees put it this way:

I find it very challenging to immunize my daughter because I don't want to give her any vaccine that I really don't know its side effect. What if at the end of the day it affects my daughter's productivity when she gets married? I'm not sure that this liquid, which is administered to newborns under the name of vaccination, has any good effects. As you can see, our forefathers lived longer than children who are even receiving vaccinations now despite not receiving these so-called immunizations. How can we be so confident that the early deaths that are so widespread in our culture today are caused by the many artificial pharmaceuticals that we give to children throughout time?(Mrs F.E./Married/50 years/Craftsmanship/Benin).

Another interviewee put it this way thus:

One major concern among parents here is the potential unknown side effects of vaccines. Many of us worry about the impact these vaccinations could have on our children's health. Some parents question whether vaccines actually work as intended. They wonder if the risks outweigh the benefits, especially considering the uncertainty surrounding long-term effects. I think it leads to hesitancy among parents. Some may delay or refuse vaccinations for their children altogether, fearing the consequences. This can result in lower immunization coverage rates and put the entire community at risk of preventable diseases (Mrs Okoaiso/ Married/ 42 years/civil servant/Benin).

Explaining further on the socio-cultural factors that affect the effectiveness of immunization programmes in Oko-Ogba community, another IDI stated as follows:

What are the medications in these little bottles actually for? In my neighbourhood, there is a child whose mother had to constantly massage the part of the body where the nurse had injected him during the vaccination exercise. It took the intervention of God for the child to regain his self-confidence. I have no faith in this item and I won't even let somebody in my immediate vicinity give it to my enemy's child,

never mind my own. What if this is part of the evil government officials plan to murder our children? Abeg, ooh, God. Even if the health centre is distant from my home, I'm still going to take care of my children's well-being according to the technique my mother taught me (Mrs T.M./Never married/Primary education/38years/Hausa/self-employed).

Discussion of Findings

The research question of this study sought to find out the challenges of effective national immunization programs for children in Oko-Ogba Community, Edo State, Nigeria. The findings of the study reveal that the challenges affecting the full participation of the immunization program by residents in the study area include the income of parents/caregivers, belief system of parents/caregivers, distance to the primary health center, as well as the timing of the immunization exercise. The result of this study is consistent with the cross-sectional research survey conducted in Uganda, which utilized data from the Uganda Demographic Health Survey and showed that religious affiliations had an impact on the uptake of children's immunizations. Studies have shown that religion impacts children's immunization rates because compared to children from Catholic homes, children from Muslim families had a lower likelihood of receiving all recommended vaccinations (Bbaale, 2015). Similar findings were achieved in Mozambique, where parents without religious affiliation were twice as likely to fail to fully vaccinate their children (Jani et al., 2008). This may be a result of the spread of erroneous information gained through religious networks. This erroneous information may be connected to anti-vaccine views, such as the notion that vaccinations include anti-fertility chemicals (Jegade, 2007). This is further buttressed by Antai's (2009) assertion that children's incomplete vaccination is a result of parents' false beliefs about the safety of vaccines and their fear of vaccine adverse effects.

Additionally, the study's findings are also in tandem with previous research conducted on the impact of ethnicity on children's immunization participation in Nigeria, which established that children from the Igbo ethnic group were almost three times more likely to be completely immunized than children from the Hausa, Yoruba, and other ethnic groups (Duru et al., 2016). They noted that the differences might be attributable to characteristics that are common at the community level. For instance, the Hausa population has a low level of education, high levels of poverty, poor prenatal care use, and bad home birth rates, all of which are linked to poor immunization participation (Duru et al., 2016).

Furthermore, the result of the study also agrees with the research conducted in Ethiopia among children between the ages of 12-23 months, which showed that children born to mothers from wealthy wealth index groups were twice as likely to receive all recommended vaccinations as children from mothers from low wealth index groups (Lakew et al., 2015; Mekonnen et al., 2020; Tamirat&Sisay, 2019). Similarly, Legesse and Dechasa (2015) showed that the media may be more accessible to wealthy parents, and they are likely more exposed to

information on the advantages of childhood immunization participation.

Lastly, the results in Table 2 showed the opinions of respondents that high levels of illiteracy, trust in the vaccines, sex of a child, age of the child, amongst others, were other factors that affected the effectiveness of the immunization program in Oko-Ogba community, Edo State. This, therefore, implies that mothers or caregivers who do not have trust concerning the safety of vaccines were less likely to immunize their children. However, mothers with a favorable perception were three times more likely to have their children completely immunized. This implies that perception affects the action of mothers about the participation of children's immunizations.

This result is in agreement with a similar study conducted in Arbegona District, Southern Ethiopia, by Negussie et al. (2015), who stated that compared to children whose mothers had a negative opinion of vaccine side effects, and those whose mothers had a favorable perception were twice as likely to have received all recommended vaccinations. The results of the study also show that in the research loci, child immunization uptake was linked to the gender of the child. This is also in line with research carried out in Ibadan, Nigeria, which found that a male child is around three times more likely to receive immunizations than a female child (Oladokun et al., 2010). This may be explained by parents' perceptions that immunization will harm their daughters' ability to have children in the future.

Put differently, children's immunization is greatly influenced by expectations about the protection that would come with it. Additionally, it was discovered from the study that knowledge of the significance of Vaccine-Preventable Diseases (VPDs) might predict non-compliance. The likelihood that mothers will increase their practice confidence to promote children's immunization uptake is higher depending on the more information they receive about the advantages of child immunization and the negative effects of not immunizing their children. This finding is in line with those of a recent systematic study conducted by Crocker-Buque et al. (2017), which sought to identify variables associated with immunization coverage in slums and underdeveloped urban centers. The result revealed that the most prevalent excuses given by parents for their children's under-immunization were a lack of knowledge of the value of immunizations and trouble accessing providers. The accessibility of clinics and various characteristics of service quality also influenced participation.

Conclusion

The primary premise for the eradication of any communicable disease by vaccination is to have an effective vaccine and to target as many people as possible who are vulnerable to the disease. Individual acts are insufficient from an epidemiological standpoint; hence strong promotion through vaccination programs is also required to encourage/stimulate an effective response. Although several approaches for increasing vaccination coverage in the research area have been found, obtaining the target levels for reaping the full advantages of immunization remains a significant issue. This may be accomplished via the

collaborative efforts of healthcare systems and providers, as well as through addressing individuals, communities, and cultures in which they reside. The study indicates that, in addition to personal protection, vaccination helps the entire community; when the majority of a population is immunized, disease transmission is halted. This is especially crucial to protect those who cannot be vaccinated owing to health reasons (e.g., those with allergies or immune-compromised patients) or who were unresponsive to immunization.

Recommendations

Based on the highlighted challenges that pose as barriers to full immunization of children in the study area, the study recommends that:

1. Innovative methods of distributing and administering vaccines and improving immunization services be developed, such as digital tools, new, needle-free techniques for vaccine administration, and more robust vaccine storage and supply chains, which promise to transform immunization programmes.
2. To accommodate people with hectic daytime schedules and boost overall vaccination uptake, one novel strategy is to provide nighttime immunization activities. As many people may find it difficult to visit vaccination centers during typical daytime hours, notably working parents and those who hold down full-time jobs, this will improve accessibility.
3. Vaccination sessions should also be tailored to prevent long wait times during routine immunization sessions; clear information on when to return should be delivered; and service delivery to all individuals should be prioritized and supported at all levels.
4. Lastly, proper planning, funding, training, monitoring, and community involvement activities be implemented in the study area, as well as a consumer-oriented approach characterized by friendliness, convenience, efficiency, and quality of services at health facilities, among other things, which can significantly contribute to the population's willingness to access them.

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