



Review Article

Breastfeeding Practices and their Impact on Infant Immunity Development in Nigeria: A Systematic Review

Temitope Afolake Awotunde¹, Salome Chibuzor Abbah², and Taofeek Adekola Basiru²

¹Oyo State College of Health Science and Technology, Eleyele, Ibadan

²College of Community Health, Lagos University Teaching Hospital. Lagos

Corresponding author: hatawot@yahoo.com

Abstract

Breastfeeding is widely recognized as a cornerstone of infant survival and immune development, particularly in low- and middle-income countries like Nigeria. This systematic review examines the prevalent breastfeeding practices among Nigerian mothers and evaluates their influence on the immune development of infants. Drawing from peer-reviewed journal articles, national reports, and global health organization databases, the review synthesizes evidence on exclusive breastfeeding, early initiation, duration of breastfeeding, and complementary feeding within the Nigerian context. The findings reveal that while many Nigerian mothers are aware of the benefits of breastfeeding, socio-cultural beliefs, economic pressures, limited maternal education, and inadequate healthcare support often hinder optimal practices. Exclusive breastfeeding for the first six months and early initiation of colostrum feeding were found to significantly contribute to improved immune responses in infants by reducing incidences of infections such as diarrhea, pneumonia, and sepsis. The study underscores the need for integrated health education campaigns, supportive workplace and community structures, and strengthened health system interventions to improve breastfeeding outcomes. It concludes that enhancing breastfeeding practices in Nigeria could substantially improve child health indicators and reduce under-five mortality.

Keywords: Breastfeeding, Infant Immunity, Socio-cultural Beliefs, Colostrum, Mortality

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Introduction

Background of the Study

Breastfeeding is globally recognized as the optimal method of feeding infants, particularly in the first six months of life. It provides complete nutrition and contributes significantly to the development of the infant's immune system. According to the World Health Organization (2023), exclusive breastfeeding (EBF) – defined as feeding infants only with breast milk, without water, other liquids, or solid food, except for medicines and vitamins, can reduce infant mortality caused by common childhood illnesses such as diarrhea and pneumonia, and helps for a quicker recovery during illness.

In Nigeria, however, despite increasing awareness of the benefits of breastfeeding, the practice of exclusive breastfeeding remains suboptimal. The 2018 Nigeria Demographic and Health Survey (NDHS) reported that only 29% of infants under six months were exclusively breastfed (Eze, Uzochukwu, and Onwujekwe, 2021). This figure is significantly below the global target of 50% set by WHO and UNICEF. Recent studies further highlight this discrepancy, citing various social, economic, and cultural factors that contribute to low breastfeeding rates (Adewuyi and Ogundele, 2022). Human breast milk is not merely a source of nourishment; it is a dynamic, bioactive fluid enriched with numerous immunological components that play a vital role in protecting infants from infections and diseases. It contains immunoglobulins (especially secretory IgA), lactoferrin, lysozyme, cytokines, growth factors, and human milk oligosaccharides (HMOs), all of which contribute to the development and modulation of the infant's immune system Bello, Abdulazeez, and Suleman (2023).

Colostrum, the first milk produced after childbirth, is particularly rich in antibodies and white blood cells, which provide passive immunity and lay the foundation for the infant's own immune response (Olorunfemi, Osagbemi and Adewuyi, 2022). Secretory IgA protects mucosal surfaces from pathogens, while HMOs promote the growth of beneficial gut microbiota such as *Bifidobacteria*, which are essential for immune system development (Agunbiade and Ogunleye, 2022). In Nigeria, where infants are frequently exposed to infectious agents due to poor sanitation, inadequate healthcare infrastructure, and high poverty levels, the immunological benefits of breastfeeding are particularly critical. Several studies such as Aghor, Ogechi, Dibley, and Ogbo (2019) have demonstrated a strong inverse relationship between exclusive breastfeeding and the prevalence of respiratory infections, diarrhea, and malnutrition among Nigerian infants.

Despite the well-documented benefits of breastfeeding, adherence to optimal breastfeeding practices in Nigeria remains low. A study by Okafor and Onuoha. (2021) in Southwestern Nigeria reported that only 46.1% of mothers practiced exclusive breastfeeding, while 40.6% initiated breastfeeding within one hour of birth. Cultural beliefs, maternal employment, low levels of education, inadequate maternity leave, and lack of breastfeeding-friendly workplace policies are among the key barriers to effective breastfeeding practices (Olorunfemi et al., 2022). Moreover, in some parts of Nigeria, harmful traditional practices still persist. For example, in parts of Northern Nigeria, colostrum is discarded due to the belief that it is "dirty" or "stale," and infants are given pre-lacteal feeds such as herbal concoctions or animal milk (Ekanem, Udoh and Akpan, 2020). Such practices not only delay the initiation of breastfeeding but also expose infants to infections and compromise their immune development.

A qualitative study by Onyeneho and Igbokwe (2023) highlighted the role of grandmothers and traditional birth attendants (TBAs) in influencing breastfeeding decisions. The study found that these individuals often discourage early initiation of breastfeeding and promote the use of local herbal remedies, which negatively impacts infant health outcomes. The Nigerian government has made several commitments to promote breastfeeding, including the implementation of the baby-friendly Hospital Initiative (BFHI), the National Policy on Infant and Young Child Feeding, and maternity protection laws. However, the enforcement of these policies has been weak. Many health facilities do not fully implement the BFHI standards, and workplace support for breastfeeding mothers remains limited, especially in the informal sector where the majority of Nigerian women are employed (Ogbona, Aniebue and Eze, 2022).

Additionally, there is a gap in postnatal education and support for mothers. While antenatal care attendance is relatively high, most health facilities do not provide sufficient breastfeeding counseling, which is essential for encouraging proper practices. Given the health significance of breastfeeding and the current challenges surrounding its practice in Nigeria, a systematic review is essential to synthesize existing evidence and provide a clearer understanding of the relationship between breastfeeding and infant immune development. While individual studies have explored various aspects of breastfeeding in Nigeria, there is a lack of comprehensive analysis that brings together findings across different regions, populations, and healthcare settings. This review aims to fill this gap by examining recent literature on breastfeeding practices in Nigeria and evaluating their impact on infant immunity. The findings from this review will not only inform policymakers and healthcare providers but also guide the development of culturally appropriate and evidence-based interventions to improve breastfeeding practices and, by extension, infant health outcomes in the country.

Breastfeeding remains one of the most effective strategies for enhancing child survival and promoting lifelong health, especially in low- and middle-income countries like Nigeria. However, despite the proven immunological benefits of breast milk, a significant proportion of Nigerian infants are deprived of exclusive breastfeeding due to cultural beliefs, inadequate support systems, and poor implementation of national policies.

Statement of the Problem

Despite overwhelming scientific evidence supporting the critical role of breastfeeding particularly exclusive breastfeeding (EBF) in enhancing infant immunity and reducing morbidity and mortality rates, breastfeeding practices in Nigeria remain far below recommended levels. According to the 2018 Nigeria Demographic and Health Survey (NDHS), only 29% of infants under six months are exclusively breastfed, significantly lower than the World Health Organization (WHO) global target of 50% (Adebayo, Yusuf and Fagbamigbe, 2019). This low prevalence persists despite increasing awareness campaigns and national policies promoting optimal infant feeding practices.

Infant morbidity and mortality in Nigeria remain alarmingly high, with infectious diseases such as diarrhea and pneumonia accounting for a significant proportion of under-five deaths (UNICEF, 2022). Numerous studies have shown that exclusive breastfeeding during the first six months of life significantly reduces the risk of such infections by providing passive immunity through bioactive components in breast milk, such as secretory IgA, lactoferrin, cytokines, and human milk oligosaccharides (Adebayo et al, 2019). Yet, many infants are introduced to water, formula, or herbal concoctions before six months practices that compromise their immune system and expose them to life-threatening pathogens.

Several factors contribute to the poor adherence to exclusive breastfeeding in Nigeria. These include deep-rooted cultural beliefs, lack of maternal support at workplaces, short maternity leave durations, limited breastfeeding counseling in health facilities, and misinformation from family and community members. In some regions, especially in rural and northern areas, colostrum is still considered "bad milk" and discarded, depriving infants of early immunity protection (Ekanem, Udoh and Akpan, 2020).

Despite the existence of the Baby-Friendly Hospital Initiative (BFHI) and various national policies to promote breastfeeding, the implementation and monitoring of these programs are weak. Moreover, there is a lack of integrated research synthesizing existing evidence on how these breastfeeding practices, or the lack thereof, specifically influence infant immune development across diverse Nigerian contexts. Therefore, the problem lies not only in the low prevalence of optimal breastfeeding practices in Nigeria but also in the

lack of systematic understanding of their impact on infant immunity. Without this knowledge, policymakers and public health practitioners may continue to implement generalized interventions that do not effectively address the underlying barriers or target the most vulnerable populations. This study seeks to bridge this gap by systematically reviewing existing literature on breastfeeding practices and their relationship with infant immune development in Nigeria. The outcome will inform evidence-based recommendations and contribute to improving child survival rates through enhanced breastfeeding interventions.

Objective of the Study

The objective of this study is to systematically review existing literature on breastfeeding practices in Nigeria and examine their impact on the development of immunity in infants.

Specific Objectives

1. To identify and analyze the prevalent breastfeeding practices among Nigerian mothers
2. To evaluate the relationship between breastfeeding practices and infant immune development
3. To examine socio-cultural, economic, and healthcare-related factors influencing breastfeeding practices in Nigeria.
4. To assess the effectiveness of national policies, programmes, and health system interventions on breastfeeding practices in Nigeria.

Research Questions

This systematic review is guided by the following research questions:

1. What are the common breastfeeding practices among mothers in Nigeria?
2. How do breastfeeding practices influence the development of immunity in infants within the Nigerian context?
3. Do socio-cultural, Economic and health care related factors influence breastfeeding practices in Nigeria?
4. What is the level of effectiveness of national policies, programmes and health system intervention on breastfeeding practices in Nigeria?

Significance of the Study

Breastfeeding is universally recognized as a life-saving, immunity-boosting practice, particularly in low- and middle-income countries where children are disproportionately exposed to infections. In Nigeria, where infant and under-five mortality rates remain high due to preventable diseases like diarrhea and pneumonia, improving breastfeeding practices could significantly reduce child morbidity and mortality. By compiling and

analyzing existing studies on breastfeeding and infant immunity in Nigeria, the review will provide policymakers, health workers, and researchers with a consolidated evidence base to inform health interventions, policy reforms, and community engagement strategies. Although numerous studies have addressed aspects of breastfeeding, there is a lack of holistic and systematic analysis that connects breastfeeding practices with immune system development in Nigerian infants. This study bridges that gap.

Scope of the Study

This study is a systematic review focused on analyzing breastfeeding practices and their impact on infant immunity development among mothers in Nigeria.

Literature Review

Breastfeeding

Breastfeeding is a fundamental and natural method of nourishing infants and young children, providing essential nutrients and immunological protection required for healthy growth and development. The World Health Organization (WHO, 2023) defines breastfeeding as the process of feeding a baby with milk directly from the mother's breast, ideally initiated within the first hour of life. Breastfeeding plays a dual role – offering complete nutritional needs and bolstering the infant's immune system, particularly during the critical early months of life. Exclusive breastfeeding (EBF), which involves feeding the infant only breast milk without any supplementary liquids or solids (except for oral rehydration solutions, drops, or syrups of vitamins and medicines), is recommended for the first six months of life. Following this period, appropriate complementary foods should be introduced while continuing breastfeeding up to two years or beyond (UNICEF, 2022).

Breast milk contains a unique blend of nutrients, including proteins, fats, carbohydrates, vitamins, and minerals, tailored to meet an infant's developmental needs. More importantly, it includes immunological components such as secretory immunoglobulin A (sIgA), lactoferrin, lysozyme, cytokines, and human milk oligosaccharides (HMOs), which play a significant role in enhancing the infant's immune system (Oni, Aluko and Lawal, 2023). In Nigeria, breastfeeding remains a culturally rooted and widely accepted practice. However, the actual practice varies widely due to factors such as maternal education, socio-economic status, healthcare access, and traditional beliefs. According to the Nigeria Demographic and Health Survey (NDHS, 2018), while breastfeeding is nearly universal, only 29% of infants under six months are exclusively breastfed – well below the WHO global target of 50%. This low rate of exclusive breastfeeding poses significant challenges to infant health and immunity, especially in regions like Uyo, where

traditional prelacteal feeding and early cessation of breastfeeding persist (Adewumi and Ogundele, 2022).

Breastfeeding is not only beneficial for the infant but also for the mother. It aids in uterine contraction post-delivery, reduces postpartum bleeding, and lowers the risk of breast and ovarian cancers. Moreover, it fosters a strong emotional bond between mother and child, contributing to long-term psychological well-being. The protective effect of breastfeeding against infectious diseases in infancy is particularly crucial in Nigeria, where infant morbidity and mortality remain high due to diarrheal diseases, respiratory infections, and malnutrition. Studies have shown that exclusively breastfed infants are significantly less likely to suffer from gastrointestinal and respiratory tract infections compared to those who are not exclusively breastfed Ezech et al. (2021). Breastfeeding also improves the efficacy of routine childhood vaccines, making it a critical component of Nigeria's broader immunization and child survival strategies (Bamisaiye, Adeyinka and Mohammed, 2021).

Despite its well-documented benefits, several barriers continue to hinder optimal breastfeeding practices in Nigeria. These include poor maternal knowledge, inadequate support from healthcare providers, aggressive marketing of breast milk substitutes, return to work policies, and societal stigma associated with breastfeeding in public (Agho et al., 2019). Addressing these barriers requires a multisectoral approach involving policy support, health education, and community engagement. In summary, breastfeeding is a critical and irreplaceable component of early childhood care, significantly contributing to infant nutrition and immunity. In Nigeria, particularly in urban and semi-urban settings, enhancing awareness and practices around breastfeeding through structured health education and supportive policies can help bridge the gap between knowledge and practice, ultimately reducing infant morbidity and mortality.

Exclusive Breastfeeding (EBF)

Exclusive Breastfeeding (EBF) refers to the practice of feeding an infant only breast milk for the first six months of life, without introducing any additional food, water, or other liquids, except for prescribed medications and oral rehydration solutions (WHO, 2023). This method is universally recommended by the World Health Organization (WHO) and the United Nations Children's Fund (UNICEF) due to its immense benefits for both the infant and the mother. Breast milk is uniquely composed of essential nutrients, antibodies, and bioactive compounds that support optimal growth, cognitive development, and immune function in infants (Onyencho and Igbokwe, 2023). These immunological components, such as immunoglobulin A (IgA), lactoferrin, lysozymes,

and leukocytes, provide passive immunity that helps the infant ward off infections during the early months of life when the immune system is still immature.

Numerous studies have demonstrated that EBF significantly reduces the incidence of diarrheal diseases, acute respiratory infections, and malnutrition in infants, especially in low- and middle-income countries such as Nigeria (Hamdan, Alkhateeb, Oriquat, Alzoubi and Ahmed, 2024). According to the 2021 Nigeria Demographic and Health Survey (NDHS), only about 29% of Nigerian infants are exclusively breastfed for the recommended six-month period, which remains below the global target of 50% by 2025. Cultural practices, maternal employment, poor lactation education, and lack of family or community support are among the major barriers to optimal EBF in Nigeria (Bello et al., 2023).

In Uyo, the capital of Akwa Ibom State, similar challenges persist. A community-based study by Ekanem et al., (2020) revealed that while awareness about EBF was relatively high among mothers, actual adherence to the six-month recommendation was much lower, often due to misconceptions about breast milk sufficiency, influence of older relatives, and early return to work. Furthermore, EBF contributes to maternal health by promoting postpartum weight loss, aiding uterine involution, and reducing the risk of breast and ovarian cancers (UNICEF, 2022). From an economic standpoint, exclusive breastfeeding is cost-effective as it reduces the need for infant formula, medical care, and time lost to child illness. To address the gaps in EBF practices, the Nigerian government, in collaboration with international organizations, has initiated breastfeeding promotion programs, such as the Baby-Friendly Hospital Initiative (BFHI) and maternity protection policies. However, these policies require stronger enforcement, community involvement, and health worker training to be truly effective (Federal Ministry of Health, Nigeria, 2021). Exclusive Breastfeeding is a life-saving, health-enhancing, and cost-effective practice that is critical for infant survival and development, particularly in resource-limited settings like Nigeria. Continuous advocacy, education, and supportive environments are essential to improve EBF rates and ensure that infants receive the full benefits of this practice.

Infant Immunity

Infant immunity refers to the developing immunity system of a newborn, which is designed to protect the child from harmful pathogens during the early stages of life. At birth, the infant's immune system is immature and underdeveloped, making them highly susceptible to infections and diseases (Agunbiade and Ogunleye, 2020). The immune system of a newborn relies heavily on passive immunity acquired from the mother through the placenta during pregnancy and through breastfeeding after birth. One of the

most critical components of passive immunity is the transfer of immunoglobulin G (IgG) antibodies across the placenta in the last trimester of pregnancy. These maternal antibodies provide short-term protection against many infections, especially those to which the mother has been exposed or vaccinated against (Bamisaie et al., 2021). However, these antibodies gradually wane after birth, and the infant must begin to develop their own immune defenses.

Breastfeeding plays a vital role in strengthening infant immunity. Colostrum and mature breast milk are rich in immunoglobulin A (IgA), lactoferrin, lysozyme, cytokines, and leukocytes, all of which help protect the infant's mucosal surfaces from infection and aid in immune system development (WHO, 2023). These immunological components help to prevent gastrointestinal, respiratory, and urinary tract infections, which are common causes of morbidity and mortality in infancy, especially in low-income countries like Nigeria (UNICEF, 2022). Studies have demonstrated that exclusively breastfed infants experience fewer infections and hospitalizations than those who are formula-fed (Olorunfemi et al., 2022). Moreover, the immune-stimulating properties of breast milk not only protect infants from infectious diseases but also modulate their long-term immune responses, reducing the risk of developing allergies, asthma, and autoimmune diseases later in life (Adebayo et al., 2019).

The early postnatal period is particularly critical, as it marks the transition from maternal to self-generated immunity. Hence, timely and appropriate nutritional and health interventions are vital for optimal immune development. Vaccination during infancy also plays an indispensable role by training the immune system to recognize and combat specific pathogens. Infant immunity is a complex and evolving system influenced by maternal factors, nutrition (especially breastfeeding), environmental exposure, and preventive healthcare interventions. Strengthening this immune system during the early stages of life is crucial to reducing child morbidity and mortality and promoting lifelong health.

Immunization

Immunization is the process by which an individual becomes protected against a disease through the administration of a vaccine. It is one of the most cost-effective and powerful public health interventions available, responsible for saving millions of lives every year globally (World Health Organization [WHO], 2023). Immunization stimulates the body's immune system to recognize and fight pathogens, such as viruses or bacteria, without causing the disease itself. Vaccines work by mimicking infectious agents and training the immune system to recognize and combat them effectively. When the body encounters the actual pathogen later, it can mount a swift and strong immune response, preventing

illness (Centers for Disease Control and Prevention [CDC], 2022). Immunization can be achieved through active or passive means. Active immunization involves the administration of vaccines that stimulate the body to produce its own immunity. In contrast, passive immunization involves the direct transfer of antibodies, offering short-term protection (Oni et al., 2023).

Immunization plays a critical role in reducing child morbidity and mortality, especially in low- and middle-income countries like Nigeria, where infectious diseases such as measles, polio, tuberculosis, diphtheria, and hepatitis B are prevalent (UNICEF, 2021). According to the Federal Ministry of Health, Nigeria (2022), expanded immunization coverage has significantly contributed to the decline of vaccine-preventable diseases over the past two decades. However, challenges such as vaccine hesitancy, poor health infrastructure, misinformation, and cultural beliefs still hinder optimal vaccine uptake in several Nigerian communities. The global immunization initiative has been instrumental in the eradication of smallpox and has brought the world closer to the elimination of polio. In fact, Nigeria was certified polio-free in 2020 after years of persistent vaccination campaigns (WHO, 2020). Moreover, immunization contributes to herd immunity, whereby even unvaccinated individuals are protected when a significant portion of the population is immune to a disease, thus disrupting transmission chains (Hamdan et al., 2024)

Routine childhood immunizations are scheduled according to the National Programme on Immunization (NPI) in Nigeria, which includes vaccines such as BCG, OPV, Pentavalent, Measles, and Yellow Fever vaccines administered at different intervals from birth through infancy (National Primary Health Care Development Agency [NPHCDA], 2022). Immunization is a cornerstone of preventive healthcare, safeguarding individuals and communities from life-threatening diseases. Strengthening immunization systems and promoting vaccine acceptance are crucial for achieving universal health coverage and the Sustainable Development Goals (SDGs), particularly Goal 3 on good health and well-being.

The prevalent breastfeeding practices among Nigerian mothers

Breastfeeding practices among Nigerian mothers are diverse and influenced by socio-cultural, economic, educational, and regional factors. While breastfeeding is widely practiced and socially accepted in Nigeria, adherence to exclusive breastfeeding (EBF) for the first six months remains suboptimal, despite strong national and international recommendations (Bamisaie et al., 2021). According to the 2018 Nigeria Demographic and Health Survey (NDHS), approximately 97% of Nigerian children are breastfed at some point, showing a high rate of breastfeeding initiation. However, only 29% of infants

under six months are exclusively breastfed, which is below the World Health Organization's (WHO) global target of 50% by 2025 (WHO, 2023). The early initiation of breastfeeding (within one hour of birth) is practiced by just 42% of mothers, and this rate is even lower in rural areas. Many mothers engage in pre-lacteal feeding, offering substances like water, glucose, herbal mixtures, or formula before breastfeeding is initiated. This practice is often rooted in cultural beliefs and misconceptions about breast milk insufficiency or colostrum being harmful (Ekanem et al., 2020).

Colostrum, which is rich in antibodies and vital nutrients, is frequently discarded by some mothers due to traditional beliefs that it is dirty or harmful, despite evidence supporting its benefits for neonatal immunity and gut development. Consequently, such practices delay proper breastfeeding initiation and may compromise infant health. Mixed feeding, the combination of breast milk and other liquids or solid foods before six months of age, is common in Nigeria and contributes to increased risk of malnutrition, diarrhea, and infection among infants (Adebayo et al., 2019). This practice is often influenced by maternal employment, lack of maternity support, poor breastfeeding education, and pressure from family members. Furthermore, maternal literacy, urban residence, antenatal care attendance, and exposure to health education significantly predict the likelihood of practicing exclusive breastfeeding (Agunbiade and Ogunleye., 2020). Mothers with secondary or higher education are more likely to adopt optimal breastfeeding practices compared to their less-educated counterparts.

Governmental and non-governmental interventions, such as the Baby-Friendly Hospital Initiative (BFHI) and community-based health education programs, have shown some positive effects in promoting EBF, but challenges such as poverty, misinformation, and limited access to postnatal support persist (UNICEF, 2021). The relationship between breastfeeding practices and infant immune development. Breastfeeding plays a fundamental role in the development of an infant's immune system. Human breast milk is not only a source of optimal nutrition but also contains a complex mixture of bioactive compounds that support immune maturation, protect against pathogens, and promote the development of the gut microbiota—an essential component of the immune system (Adewuyi and Ogundele ,2022).

One of the most critical components of breast milk in immune development is colostrum, the first milk produced after birth. Colostrum is rich in secretory Immunoglobulin A (sIgA), lactoferrin, lysozyme, leukocytes, and cytokines, which help establish passive immunity in the neonate by forming a protective barrier on mucosal surfaces (Ekanem et al., 2020). These immunological factors provide protection during the first months of life when the infant's immune system is still developing. Exclusive breastfeeding (EBF) for

the first six months has been shown to reduce the incidence of respiratory infections, gastrointestinal diseases, and other immune-related conditions such as atopic dermatitis and asthma (Agunbiade et al., 2020). This is because EBF reduces exposure to contaminated food or water, while the immune components in breast milk continuously strengthen the infant's natural defenses. Moreover, breastfeeding contributes to the development of the gut microbiota, which is essential for immune programming. Human milk oligosaccharides (HMOs) found in breast milk serve as prebiotics that selectively promote the growth of beneficial bacteria, such as Bifidobacteria and Lactobacilli, which play key roles in modulating immune responses and protecting against inflammation. In contrast, early cessation of breastfeeding or the introduction of mixed feeding can disrupt this immune-boosting process. Infants who are not exclusively breastfed are at greater risk of infections, impaired gut flora development, and lower immune competence due to reduced exposure to immunomodulatory components of breast milk (Ezeh et al., 2021).

Furthermore, studies have demonstrated a dose-response relationship between breastfeeding duration and immune benefits. Longer breastfeeding durations are associated with a reduced risk of autoimmune diseases and chronic conditions such as type 1 diabetes, obesity, and certain cancers later in life, as the immunological imprinting from breastfeeding extends beyond infancy (Bello et al., 2023).

In Nigeria and other developing countries, where infectious diseases remain a leading cause of under-five mortality, promoting optimal breastfeeding practices is particularly important for enhancing infant immunity and survival. According to Adewuyi et al. (2022), improvements in exclusive breastfeeding rates can significantly reduce infant morbidity and mortality due to infectious diseases.

Theoretical Framework

The Health Belief Model (HBM)

The Health Belief Model (HBM), developed by Rosenstock and further elaborated by scholars such as Glanz, Rimer, and Viswanath (2015), posits that health-related behaviors are driven by individual perceptions of risk, benefits, barriers, and cues to action. In the context of breastfeeding, HBM suggests that a mother's decision to breastfeed exclusively or otherwise is influenced by her belief in the susceptibility of her infant to infections if not breastfed, the perceived severity of potential illnesses, the perceived benefits of breastfeeding in enhancing immunity, and the barriers she may face, such as lack of support or workplace constraints. Furthermore, external stimuli like health campaigns and advice from healthcare providers serve as cues to action, while self-efficacy reflects the mother's confidence in her ability to breastfeed effectively. Applying HBM to the Nigerian context, Ezeh et al. (2021) found that maternal knowledge, risk perception, and health motivation significantly influenced early initiation and exclusivity of

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breastfeeding practices. Therefore, HBM helps explain the cognitive and motivational factors underpinning maternal feeding choices and their implications for infant immune health.

Research Methodology

The process followed a rigorous and structured approach to identify, select, appraise, and synthesize relevant studies to address the research questions. This study employed a systematic review research design, which is appropriate for synthesizing existing evidence from multiple sources on a specific topic. A systematic review is a methodical and replicable process that ensures comprehensive coverage and minimizes selection and publication bias. It allows the researcher to collate, appraise, and interpret all relevant studies related to breastfeeding practices and their impact on infant immunity in Nigeria.

To ensure reliability, data extracted from studies were cross-checked against the original texts. Additionally, the methodological quality of the included studies was assessed using the Critical Appraisal Skills Programme (CASP) checklist, particularly for qualitative and observational research.

Discussion of Results

The analysis and synthesis of findings from the selected studies based on the systematic review of breastfeeding practices and their impact on infant immunity development in Nigeria were carried out while the data were extracted, organized, and thematically analyzed to answer the following research questions: A total of 28 studies published between 2015 and 2024 were included after a rigorous screening and quality appraisal process.

Research question 1: What are the common breastfeeding practices among mothers in Nigeria?

Thematic analysis revealed several dominant breastfeeding practices across different regions of Nigeria. The themes identified include:

a. Early Initiation of Breastfeeding

Several studies reported varying levels of early initiation of breastfeeding (within the first hour after birth). According to Bamisaiye et al. (2021), early initiation was more common in urban hospitals (approximately 68%) than in rural areas (45%), often influenced by the presence of skilled birth attendants.

b. Exclusive Breastfeeding (EBF)

Exclusive breastfeeding for the first six months was emphasized in over 90% of the reviewed studies. However, actual practice was often lower. For example, Agunbiade and Ogunleye (2020) found that while 76% of mothers were aware of EBF, only 43% practiced it consistently. Reasons for non-adherence included maternal employment, cultural beliefs, and lack of support.

c. Duration of Breastfeeding

The duration of breastfeeding varied, with most mothers' breastfeeding for 12–18 months. A study by Adewuyi and Ogundele(2022) noted that only 28% of mothers continued breastfeeding beyond 18 months, largely due to early return to work and societal pressure.

d. Complementary Feeding

Introduction of complementary feeding was commonly practiced between 4–6 months. While some mothers introduced it appropriately, others introduced solid foods prematurely, which could compromise immune protection. Okafor et al., (2021) linked early complementary feeding to increased risk of diarrhea and infections.

Research question 2: What are the influence of breastfeeding practices on infant immunity?

The relationship between breastfeeding and infant immunity was extensively explored in the reviewed studies. The following facts emerged:

- Breast milk was shown to contain immunoglobulins (particularly IgA), cytokines, lactoferrin, and leukocytes, which provide passive immunity to infants. According to Bamisaiye et al. (2021), infants exclusively breastfed for the first six months exhibited significantly lower incidences of respiratory tract infections and gastrointestinal illnesses.
- Early initiation of breastfeeding allows the newborn to consume colostrum—the "first milk" rich in antibodies. Several studies, including one by Okafor and Onuoha (2021), emphasized that delayed initiation was associated with higher neonatal morbidity, especially in low-income settings.
- A study by Adebayo et al. (2019) highlighted that exclusive breastfeeding enhances the immune response to routine childhood vaccinations such as BCG, polio, and DPT. Breastfed infants demonstrated stronger antibody production post-vaccination compared to their formula-fed counterparts. Consistent findings

- across studies supported that exclusive and prolonged breastfeeding reduces susceptibility to common infections such as diarrhea, pneumonia, otitis media, and sepsis. For instance, a study in Kano State (Oche, Umar and Ahmed, 2011) revealed that non-breastfed infants had a threefold higher risk of hospital admission for infectious diseases.
- Breastfeeding was also associated with optimal nutritional status, which in turn supports immune development. According to Nduka et al. (2023), malnourished infants (often inadequately breastfed) had weaker immune responses and slower growth patterns.

Research question 3: What are the socio-cultural, economic, and healthcare-related factors influencing breastfeeding practices among Nigerian mothers?

Breastfeeding practices among Nigerian mothers are not determined solely by biological factors but are significantly influenced by socio-cultural norms, economic status, and the structure of healthcare systems. These interconnected factors either promote or hinder optimal breastfeeding practices, which are vital for the health and immune development of infants.

1. Socio-cultural Factors

Cultural beliefs and traditions play a crucial role in shaping breastfeeding practices in Nigeria. In many communities, beliefs around colostrum being "dirty" or "harmful" still persist, leading some mothers to discard it and delay initiation of breastfeeding (Okafor et al., 2022). Some ethnic groups also promote prelacteal feeding – giving water, herbal concoctions, or animal milk – based on traditional beliefs, which undermines exclusive breastfeeding. The role of elders, particularly grandmothers and mothers-in-law, significantly influences infant feeding choices. According to Ekanem et al. (2020), many new mothers in Uyo, Akwa Ibom State, receive infant feeding instructions from older female relatives, which may conflict with WHO recommendations. Additionally, societal expectations about motherhood, body image, and returning to work early further discourage sustained breastfeeding practices. Religious teachings and community norms can also influence perceptions. For example, some religious sects discourage breastfeeding in public, while others advocate for early weaning (Adebayo et al., 2019).

2. Economic Factors

A mother's socio-economic status significantly affects her ability to breastfeed optimally. Lower-income mothers often return to work shortly after childbirth due to financial pressures, limiting the time available for exclusive breastfeeding (Agunbiade et al., 2020). Without paid maternity leave or workplace breastfeeding facilities, many resort to early complementary feeding or bottle-feeding, which can compromise infant immunity. Urban mothers may have better access to information about breastfeeding but face higher workplace demands, while rural mothers may lack adequate information but have more time for breastfeeding (Adewumi et al., 2022). Thus, economic disparities manifest differently but still influence breastfeeding outcomes. Moreover, the affordability and aggressive marketing of breast milk substitutes have contributed to the decline in breastfeeding practices among economically disadvantaged families who perceive formula as modern or superior (UNICEF, 2022).

3. Healthcare-related Factors

The quality of antenatal and postnatal care received by mothers significantly impacts breastfeeding initiation and continuation. According to the Nigeria Demographic and Health Survey (NDHS, 2018), mothers who deliver in healthcare facilities are more likely to receive breastfeeding counseling and initiate breastfeeding early compared to those who deliver at home. Healthcare worker attitudes and the availability of lactation support services also play a role. Where health personnel are well-trained in the Baby-Friendly Hospital Initiative (BFHI) guidelines, mothers are more likely to exclusively breastfeed (Ogbenna et al., 2022).

However, gaps in training, staff shortages, and lack of breastfeeding support services in primary healthcare centers – especially in rural areas – limit mothers' access to correct information and encouragement (Bello and Ogunbanjo, 2021). Moreover, misinformation or lack of education among health professionals themselves contributes to conflicting advice, leading to confusion among mothers (Oni et al., 2023). Integration of breastfeeding support in immunization and child welfare clinics remains inconsistent, thereby weakening health-system efforts to promote optimal infant feeding.

Research question 4: What is the effectiveness of national policies, programs, and health system interventions on breast feeding practices in Nigeria?

Over the years, Nigeria has implemented several national policies and programs aimed at promoting optimal breastfeeding practices to improve child survival and development outcomes. These efforts have focused on enhancing maternal knowledge, strengthening

health systems, and promoting community engagement. The effectiveness of these interventions, however, remains mixed due to challenges in implementation, socio-cultural barriers, and gaps in health service delivery.

One of the major policy instruments is the National Policy on Infant and Young Child Feeding (IYCF), first introduced in 2005 and revised in subsequent years. The policy emphasizes early initiation of breastfeeding, exclusive breastfeeding for the first six months, and continued breastfeeding up to two years and beyond with appropriate complementary feeding. Studies have shown that awareness of this policy has contributed to improved knowledge and practices among health workers and some mothers (Federal Ministry of Health [FMoH], 2021; Agho, 2019). However, implementation fidelity varies significantly across different regions and health facilities Ogechi et al., (2019).

The Baby-Friendly Hospital Initiative (BFHI), launched by WHO and UNICEF and adopted in Nigeria in the early 1990s, aimed to ensure that maternity care providers support breastfeeding practices. Although many hospitals were designated as “baby-friendly,” a decline in adherence to BFHI standards has been reported due to lack of political will, inadequate training, and poor monitoring mechanisms (Agunbiade and Ogunleye, 2020; Ogbonna et al., 2022). Additionally, community-based programs such as the Ward Development Committees and community health extension workers (CHEWs) have played a role in increasing breastfeeding awareness and support, particularly in rural areas. A systematic review by Bamisaiye et al. (2021) indicated that interventions that included peer support and home visits significantly increased exclusive breastfeeding rates and early initiation.

From a legislative perspective, Nigeria enacted the International Code of Marketing of Breast-Milk Substitutes, which regulates the marketing of infant formula and other substitutes. Despite this, enforcement has been weak, and violations by infant food companies persist, undermining breastfeeding promotion (UNICEF, 2022). The National Health Insurance Scheme (NHIS) has also been proposed as a platform to support maternal and child health, including breastfeeding counseling services. However, limited coverage and poor access in rural communities reduce the potential impact (Onyeneho and Igbokwe, 2023). Importantly, maternity protection laws, including provisions for paid maternity leave, are limited in Nigeria. The Labour Act provides only 12 weeks of paid maternity leave, which is below the 14 weeks recommended by the ILO. The absence of breastfeeding-friendly workplace policies continues to hinder working mothers’ ability to exclusively breastfeed (Aluko and lawal., 2023).

While national policies and health system interventions in Nigeria have shown some success in raising awareness and improving breastfeeding indicators, their overall effectiveness is hampered by inconsistent implementation, inadequate funding, weak enforcement of regulations, and sociocultural dynamics. To enhance effectiveness, there is a need for multi-sectoral collaboration, increased investment in training and monitoring, and stronger policy enforcement mechanisms.

Conclusion

This systematic review concludes that breastfeeding, particularly exclusive breastfeeding and early initiation, is vital for promoting infant immunity in Nigeria. Despite widespread knowledge of the benefits, there remains a significant gap in practice due to cultural, social, and economic barriers. The reviewed studies highlight that breastfed infants are better protected against infections, respond better to vaccines, and show enhanced overall health outcomes. Therefore, promoting optimal breastfeeding practices is essential not only for individual child health but also for reducing under-five morbidity and mortality rates in Nigeria.

Recommendations

Based on the findings of this review, the following recommendations are made:

- Governments and Non-Governmental organizations (NGOs) should intensify awareness campaigns, especially in rural areas, to correct cultural myths around colostrum and promote early initiation and exclusive breastfeeding.
- Employers should be encouraged to provide extended maternity leave and breastfeeding breaks to support working mothers.
- Continuous training of healthcare providers (especially in primary healthcare centers) on breastfeeding counseling is essential.

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