

Knowledge, Attitudes and Practices on Exclusive Breastfeeding in Adamawa, Nigeria

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Abstract Background: Despite the efficacy of the Early Exclusive Breastfeeding (EBF) approach to child nutrition in reducing child mortality, few nursing mothers in Nigeria are willing to adopt this method of feeding. **Objective:** This research was therefore undertaken in order to assess the Knowledge, Attitudes and Practices (KAP) on EBF of antenatal clinic attendees in North-eastern Nigeria. **Study Design:** Cross Sectional Community Survey. **Methods:** Two hundred and fifty expectant mothers attending the ANC clinical sessions at Specialist Hospital, Yola, Adamawa State, were recruited for this study. The mean age of the women was twenty eight. Data was generated from a corpus consisting of health talks and questionnaires on the respondents' KAP on EBF during these clinical sessions at this health facility. **Results:** The results of the survey revealed the problems that inhibit or reduce the practice of exclusive breastfeeding to include the following: the assumption that colostrum is stale milk--84%; breast milk lacks sufficient nutrients--approximately 62%; and expressed breast milk is contaminated milk--just under 98%. With respect to the mother's attitude to EBF, 60% believed that this method of feeding would flatten their breasts and 78% that EBF causes respiratory tract infections. Furthermore, over 64% thought that food supplements were ideal for infants and that EBF was suitable only for working mothers. **Conclusion:** These results clearly demonstrate the lack of awareness and education on EBF. From both a national and international perspectives, poor maternal nutrition, inadequate support from spouses, family and even nurses and doctors are some of the constraints that limit the rate of practicing exclusive breastfeeding. Public health initiatives on the benefits of EBF need to be addressed, particularly at antenatal clinics and also through outreach programs that target mothers in the rural communities who have limited access to health care.

Keywords: *exclusive breastfeeding, public health, knowledge, attitude and practices, colostrum*

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1. Introduction

Breastfeeding addresses all four facets of health, which are physical, spiritual, mental and social [1,2] for mothers, children, fathers/partners, and the immediate family [3]. EBF during the first year of a child's life ensures the provision of certain biological and psychological needs and therefore increases the probability of survival during this critical stage of development [4]. Consequently, mothers are encouraged to breastfeed exclusively in the first six months of a child's life in antenatal and postnatal clinical sessions and through a range of mass media [5,6].

Studies have shown that breastfeeding during the early stages of a child's development stimulates the immune system and improves the child's responses to inoculation [7,8,9]. Reduction in the incidence of gastrointestinal (GI) diseases [10,11], respiratory infections [12,13,14], ear infections [15] and improvements in dentition [16] have been observed in children who have been breastfed exclusively for six months or more.

Breast milk contains antibodies and enzymes that stimulate an infant's growth and development. Consequently, children who are breastfed are less prone to childhood cancers, childhood diabetes, asthma, gestational diseases, allergies, leukemia and lymphoma, as well as neurological disorders [9,17].

Colostrum, also known as the first milk, produced during the perinatal and lasting two to four days after the initial phase of the lactation period [18] is a rich source of IgA and all the vitamins, including Vitamin K [19]; the primary micronutrients being sodium, potassium, calcium, magnesium, phosphorus, a range of proteins including casein and essential fatty acids (EFA) such as docosahexaenoic acid (DHA), which is an omega 3 fatty acid found to be an integral component of brain and retinal tissues [20,21]. Colostrum has been shown to contain higher content of immunoglobins, growth factors [22], protein [23] and EFA's than normal breast milk [24,25]. Additionally, the IgA content of this first milk plays a vital role in protecting the neonate's gut against *Helicobacter pylori*, *Escherichia coli* infections and other GI tract infections [26,27,28,29].

Sub optimal EBF has been linked to an increased risk for autism spectrum disorders (ASD), Attention Deficit Hyperactivity Disorder, Schizophrenia, Depression, Pervasive Developmental Disorders, and Epilepsy [30,31]; furthermore, there has been evidence of an increase in the cognitive abilities and educational achievement of children associated with DHA in breast milk [32]. With respect to the psychological effects of EBF, it has been proposed that the process of breastfeeding increases the bonding between mother and child and therefore increases the chances of academic success [33].

In terms of maternal health, breastfeeding has a number important health benefits. Breastfeeding in the first hour of birth facilitates the expulsion of placenta, reduces postpartum haemorrhaging and also expedites the recovery from the trauma of childbirth and labour [34]. Additionally, breastfeeding helps the mother's uterus to return to its prepregnancy size [35].

Endocrinological studies by Tay et al (1993) [36] have demonstrated that exclusive breastfeeding has been associated with a reduction in gonadotropin levels and the cessation of the menstrual cycle, thus reserving the stores of iron while serving as a natural form of birth control [37]. Furthermore, women who breastfeed return to their pre-birth weight more easily. In later life, nursing mothers are offered some degree of protection from both breast and ovarian cancer and also osteoporosis [38,39,40,41]. In fact, there is a direct correlation between the length of time a mother breastfeeds and the protective effect against breast cancer [42].

At the Innocenti Declaration in 1990 [43], the WHO/Unicef called for all countries to implement national policies that would promote EBF and also support HIV positive mothers [44]. They proposed that the most effective method of saving the lives of 3,500 children per day would be through effective breastfeeding. The latter international nongovernmental agencies have jointly encouraged countries globally to cultivate a culture that encourages women to breastfeed their infants exclusively for the first six months of life followed by complementary nutritional supplements for up to two years and older if feasible [45]. During World Breastfeeding Week in August 2008, the Unicef executive director, Ann M. Veneman, stated that, "Breastfeeding is a key tool in improving child survival," and that, "Exclusive breastfeeding for the first six months of life can avert up to 13 per cent of under-five deaths in developing countries" [46].

From a national perspective, the Federal Ministry of Health (FMH) has developed diverse exclusive breastfeeding campaign messages propagated in a range of mass media outlets and at antenatal clinics based on other models by health agencies across the globe [47,48,49]. The implementation of this national nutrition policy by the FMH was as proposed by the WHO & Unicef (2003) [45], with the overall objective of improving the growth and development of Nigerian children from birth to infancy.

Despite the benefits of breastfeeding infants exclusively in the first six months, research indicates that only slightly more than one third of all infants worldwide are exclusively fed for this period [50,51]. In a recent Unicef report on breastfeeding, compliance levels were found to be 43% in Asia/Pacific, followed by 41% in Eastern/Southern

Africa, with Central/Western Africa at the lowest level at 20% [52,53,54].

Data from the WHO/Unicef Global report for infant and young child feeding (2003) [45] states that 22.3% of children were exclusively breastfed for less than four months, while only 17.2% were exclusively breastfed for less than 6 months, in the year 2003 [54,55]. A recent demographic health survey indicates a mere 13% compliance level in Nigeria [54,56]. All these figures are far below the 90% level recommended by the WHO [57,58].

In Nigeria, while breastfeeding initiation is on the increase at health facilities after delivery [34], the sustained practice of EBF once the mothers return home has remained low [58,59]. Support, education and awareness for new mothers on breastfeeding practices by Baby Friendly Hospital Initiatives (BFHI) [60,61] would help to increase the success rate of EBF with concerted efforts for up to the recommended six month period (citation) in both the urban and rural communities as demonstrated by Ojofeitimi et al., (2000) [62] in Osun State.

From a global perspective, Nigeria's under-five mortality rate per 1,000 ranks in the top ten globally at 124 as of 2010 [63]. Successful breastfeeding can therefore play a crucial role in curbing infant malnutrition and in achieving the millennium development goals four [reducing child mortality] and five [improving maternal health] [64].

2. Materials & Methods

2.1. Type and location of Study

A Cross Sectional Community survey was conducted at antenatal clinical sessions at Specialist Hospital, Yola, Adamawa State, and North East Nigeria. The participants of the study were from various communities in the twenty one local governmental areas (LGA's) of Adamawa State.

2.2. Sample Size

Two hundred and fifty pregnant women in the first, second and third trimesters aged between 20 and 45 were recruited to participate in this study and their mean age was twenty eight years.

2.3. Research Instrument

This Cross Sectional Community Survey was designed based on health talks and questionnaires on EBF. Components of both the Toulmin's argumentative [65,66] and the (I) information (E) education (C) communication models [67] were used for both the health talks and questionnaires.

2.4. Data Collection

The health talks were tape-recorded in three clinical sessions and were then transcribed. Excerpts from the transcripts in the major indigenous languages of Adamawa State were translated into English. All two hundred and fifty pregnant women were invited to complete the questionnaires.

2.6. Data Analysis

The basic knowledge in the health talks and the respondents' KAP were compared and interpreted from two standpoints: congruence and incongruence between the structure of knowledge in both the health talks and the respondents' KAP on EBF.

2.7. Ethical Considerations

The study undertaken was in compliance with the World Medical Association (WMA), Declaration of Helsinki [68] and the International Guidelines of Biomedical Research [69] involving human subjects. All participants in this project read and signed written consent forms agreeing to participate in this study.

3. Results

3.1. Pregnant Women's KAP on Breastfeeding and Breast milk.

The results in Table 1 clearly demonstrate the lack of knowledge on the nutritional value of both breast milk and colostrum. This is highlighted by the fact that just over 80% and just fewer than 40% of expectant mothers who participated in this study stated that colostrum and expressed milk respectively were stale. With respect to breastfeeding, even more alarming data derived from this research stems from the fact that more than 90% of mothers were under the impression that EBF was not ideal for the tropics and over 78% thought that EBF causes respiratory tract infections (RTI) (Table 2).

Table 1. Nursing mother's knowledge on EBF

Question	True	False	Undecided
Colostrum is a stale milk	210(84)	40 (16)	00(00)
Breast Milk lacks sufficient nutrients	62 (24.8)	114 (67)	04(16)
Expressed breast milk is a contaminated milk	98 (39.2)	150 (60)	02(08)

Table 2. Nursing mother's attitude on exclusive breastfeeding

Question	True	False	Undecided
EBF flattens the breast	150(60)	92(36.8)	08(3.2)
EBF is not ideal in the tropics	225 (90)	25(10)	00(00)
EBF causes RTI	195 (78)	53(21.2)	02(08)

The results in Table 3 give a plausible explanation for the low EBF compliance levels, with over 64% and 92% respondents respectively stating that food supplements

and treated water were ideal for infants; and roughly 73% stating that EBF was ideal for working mothers.

Table 3. Nursing Mother's practices on Exclusive Breastfeeding

Question	True	False	Undecided
Food supplements is ideal for infants	160 (64)	90 (36)	00(00)
Treated water is ideal for infants	230(92)	20(08)	00(00)
EBF is ideal for working mothers	182(72.8)	65(26)	03(12)

3.2. Case Studies on KAP on Mothers on EBF

Further evidence of the lack of KAP was demonstrated by the two different case studies (Table 4a&b); for example, the first mother, Mrs. M1 (a mother of five) (Table 4a), who based on the lack of education, assumed that EBF is alarmingly strange; further misunderstanding

is demonstrated by her statement her child's diarrhea was due to teething rather than to the use of dirty water in preparing her child's food, while Mother Mrs. M2 (Table 4b) was forced to abandon EBF due to work constraints and cultural beliefs that were reinforced by an elder in the family.

Table 4. Profiles on Mothers M1 & M2

Table 4a: Profile on Mother M1
M1. is a mother of five who had never been to school. Her husband's new offer as a security guard in an American University brought her to Yola. She finds the idea of feeding a child exclusively with breast milk extremely bizarre and associates the frequent bout of diarrhoea in her children to teething problem rather than unclean water as told by the midwife.
Table 4b: Profile on Mother M2
Profile on Mother M2
M2. is a mother of two and believes in the health value exclusive breastfeeding. But the challenges of her new job and a refresher course she is undergoing has made her to consider giving her expectant baby food supplement, glucose and water as her grandmother always opined.

3.3. Group Discussions and Talks on EBF

Argumentative components of this research as outlined in Table 5 were critical in the awareness of breastfeeding and related issues in this cohort of pregnant women. The rhetorical component that breast milk constitutes 70% water is very important, as well as the fact that infants who are exclusively breastfed will develop immunity and

will be less prone to diseases including human immunodeficiency infections [70,71].

Further misconceptions were addressed in the health talks at these antenatal clinical sessions at Specialist Hospital. Statements made by antenatal attendees show that they believed that breastfeeding affects the shape of the breast, that EBF can lead to RTI and is not ideal in the tropics. These misunderstandings were clarified by the health workers at talks at these sessions (Table 6).

Table 5. Argumentative Components based on Feedback from Mothers at Health talks at Specialist Hospital

Rhetorical Component	Instantiation
Claim	Babies who are exclusively breastfed are healthier than those who are not
Grounds	Breast milk contains nutrients which develops the child's immune system and makes him less susceptible to diseases
Backing	Studies have shown that a child who is exclusively breastfed survives the six childhood diseases
Warrant	Mothers who supplement breast milk with water expose the child to diarrheal infection
Qualifier	Most children who are breastfed turn out to be very intelligent
Rebuttal	Even mothers who live in the tropics are also advised to breastfeed exclusively because about 70% of breast milk is water

Table 6. Claims and Rebuttals based on Feedback from Mothers at Health talks at Specialist Hospital

Claim or Opinion	Counter Claim or Rebuttal
Objection	Exclusive breastfeeding flattens the breast
Answer	It depends on the structure of the breast
Objection	Exclusive breastfeeding causes respiratory tract infection
Answer	There is no empirical evidence to support this claim.
Objection	Exclusive breastfeeding is not ideal in the tropics(hot zones)
Answer	Timbuktu (Mali) where the idea of Exclusive breastfeeding was experimented is a hot zone. The results of the findings OF study conducted indicate that exclusive breastfeeding is highly efficacious in the study area.

4. Discussions

These results confirm that likelihood of mothers practicing EBF is hampered by cultural norms and the lack of knowledge on breastfeeding [72,73]. The open dialogue at the antenatal sessions at Specialist Hospital between the expectant mothers and health workers was a source of enlightenment and helped to dispel common myths and incorrect beliefs on EBF.

The low EBF compliance levels were multifactorial but were mainly due to the work commitments [74,75,76] and the lack of spousal support [58]. Measures and policies set in place by employers to ensure the provision of lactation rooms in the workplace, where mothers can express their milk for their infants and breastfeed if needed [77,78,79], as well as the extension of maternal leave might prove effective in increasing the level of EBF [75,80,81]. Supplemental bonuses should also include the provision of day care centres [82].

In Nigeria, the early initiation of EBF has been demonstrated by Awi et al. (2007) [83], with health workers assisting mothers in the transition to EBF within an hour of the delivery. Sustained and prolonged EBF during the postpartum period can be achieved with the support of hospital staff not only during the perinatal stage and but with the help of health visitors at the community level [84,85]. From a global perspective, Baby Friendly Initiatives in Australia [60] as well as those in Spain in partnership with Unicef [61] have increased the success rate of EBF.

Studies in different parts of Nigeria are in line with our research and confirm that mothers often discard the colostrum due to the belief that this enriched and first extract from the breast was dirty [86]. This common practice results in the delay of the initiation of EBF during the perinatal period. The substitutions of colostrum with honey, animal milk and herbal preparations [87] are culturally enriching but cannot replace the nutritional value of breast milk or colostrum.

Introducing infants to honey increases the risk of food botulism due to bacterial toxins from *Clostridium*

botulinum, sometimes found in raw honey [88,89]. In circumstances where boiled water is not available, there is an increased risk of the newborn contracting diarrheal diseases from contaminated water [90]. The neonate may also be at risk of gastrointestinal infections due to the unsanitary conditions during the food preparation [91,92]. Walker et al (2013) [93] have reported that diarrhea is responsible for 72% of deaths in infants up to age two, and 88% of diarrheal related deaths are due to unsafe water and improper sanitation [52,53].

The overwhelming majority of those who took part in this study stated that colostrum and expressed milk were stale. Certain cultures discard the first milk as it is considered to be dirty and pus like [87]. These observations are based on the color and texture of this nutrient, which are due to the physiological process by which this foremilk is produced by the mammary glands and stored until the postpartum period, which may be delayed if there are any perinatal and postnatal complications.

The controversy on physical appearance of the first milk is insignificant in comparison to its nutritional value. Colostrum has twice the fatty acid content as normal breast milk and is important in the diet of neonates for the prevention of neurological and developmental disorders [31] and has twice the protein content of breast milk [24], which is important for growth. It is also rich in immunoglobulins and antimicrobial peptides, which promote the maturation of the intestinal tract and act as a deterrent against GI tract infections such as cholera and rotavirus and *Escherichia coli* [94].

Both colostrum and expressed milk can indeed become stale milk if proper hygiene and sanitation are not observed in order to prevent microbial contamination due to bacteria and even HIV [95]. Awareness of the importance of the sterilization of the storage bottles and pasteurization of the milk products can curtail these problems; in fact, refrigeration is not required after heating [96]. These methods of preparation are critical for future use, not only for nursing mothers but for recipients who have agalactorrhea, or low milk production [97]

during the postpartum period and even health workers in the obstetric and neonatal units in medical facilities.

The misconception of most of the women in this study that EBF is not ideal for the tropics is based on concerns that infant dehydration may occur. Adamawa State is near the equator, with an arid and extreme climate. Temperatures average 95°F throughout the year and can exceed 105°C during the months of February and May, with a harmattan season between December and January. Research by Almroth (1990) [98] has shown that even in hot and dry climates, exclusively fed babies remained healthy with no additional water or supplements.

There is a high risk of feeding infants contracting respiratory disorders such as bronchitis, asthma, and allergies due to maternal and spousal smoking [99,100,101]. Research by Malloy et al. (1988) [102] has shown a direct correlation between neonatal exposure to passive smoke and respiratory diseases as well as sudden infant death syndrome. These facts are the most plausible reasons why most of the expectant mothers in this study associated EBF with RTI.

In more traditional times, the sign of flabby breasts by the experienced mothers commanded respect from the community [103]. In today's society, the perceptions by women across the globe, including over half the participants of this study, are that EBF will result in sagging breasts. However, the reasons are, in fact, multifactorial and include the age of the mother, excessive exposure to sunlight, maternal nutrition, a decrease in the elastin fiber network of the skin [104], reduced tone in the pectoral muscles, as well as the type and size of support garments [105] worn before, during and after breastfeeding. In fact, women over fifty who are nulliparous can have the same condition of dropping breasts as those around the same age who are multiparous and who breastfed all their offspring. In short, there is no direct correlation between breastfeeding and sagging breasts.

The aforementioned facts and protective effects of EBF against breast and uterine cancers are some of the positive aspects of breastfeeding. Furthermore, women who breastfed have a higher probability of returning to their pre-pregnancy size than those who do not [35]. Knowledge of all of these facts can help to improve the image and self-esteem of mothers who breastfeed and also increase the chances of practicing EBF.

Expectant mothers can be enlightened on the beneficial roles of EBF for both maternal and infant health by regular antenatal clinic attendance. In fact, research by Ogbonna & Daboer (2006) [106] has shown a direct correlation between the practice of EBF and antenatal clinic attendance.

5. Conclusion

Given the magnitude of infant mortality due to malnutrition, particularly in Africa [107,108] and specifically Nigeria [109], EBF can play a pivotal role in curtailing this dilemma. However, the key to the success of EBF must be through education at antenatal clinics and with sustained support through the BFI programs during the pre-, peri- and postnatal periods. More realistically, an integrated approach should include awareness of vaccination programs, nutrition, family planning, personal

hygiene as well as both domestic and environmental sanitation. The dissemination of positive messages on EBF to mothers and their families, especially in the rural communities, by non-governmental and governmental health agencies is likewise essential. All of these public health initiatives combined can lead to significant improvements in both maternal and infant health in this most populous West African nation.

Competing Interests

The authors declare that they have no competing interests.

Authors' Contributions

JAT, RK and DC all fully participated in the conception, development of the methodology, and were instrumental in the data analysis and interpretation of all the written contents of this manuscript.

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