



A Systematic Review on Exclusive Breastfeeding Practice in Sub-Saharan Africa: Facilitators and Barriers

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Abstract

Exclusive breastfeeding (EBF) for the first six months is important to the wellbeing of both infant and mother. Despite its benefits, the rate of EBF and early initiation of breastfeeding remains critically low in many countries in Sub-Saharan Africa. Understanding the factors that influence infant feeding will help in promoting, protecting and supporting breastfeeding practice. The aim of this review was to give a critical appraisal of the benefits, facilitators and barriers to EBF practice in West Africa along with concerns which may hinder the practice of breastfeeding. The study adopted a desk review of existing literatures on infant feeding practices in sub-Saharan Africa. The review gives a succinct description of the human breast and the physiology of milk production; with the composition and characteristics of breast milk. It identifies high socioeconomic status, delivery at health facility, knowledge of mothers and expensive infant formula as major facilitators of EBF. However, socio-cultural beliefs, illiteracy of mothers, home delivery, cracked nipples, milk insufficiency and breast engorgement of mothers were found to be major barriers and factors which influence breastfeeding practice in terms of initiation, exclusivity and duration in West Africa. Conclusively, this review opined that scaling up exclusive breastfeeding practice in most communities in West Africa should involve policy and programme interventions that aim at correcting the misconceptions surrounding exclusive breastfeeding practice and also stress the benefits of exclusive breastfeeding. To achieve meaningful impact, these interventions must involve crucial key players that influence in the decision of a mother to exclusively breastfeed.

Keywords: Exclusive Breastfeeding; Benefits; Facilitators; Barriers; Sub-Saharan Africa

Introduction

Inadequate or inappropriate breastfeeding is responsible for the mortality of 1.4 million children and the disability of 44 million globally [1]. Based on this fact, all women are recommended to exclusively breastfeed their infants in the first six months and subsequently with supplementary feeding for 2 years for optimal growth and development [2]. The World Health Organization and UNICEF had introduced numerous programmes viz the baby

friendly hospital initiative and the International Code of Marketing of Breast Milk Substitutes in order to protect, promote and support breastfeeding in response to persistent dwindling in the rate of breast feeding worldwide [2,3].

Breastfeeding remains the cheapest, easiest and wholesome feeding method for all infants as it meet all the infants' requirements [4]. The several advantages of breastfeeding are of public health importance both for the developing countries and

industrialized nations. Breastfeeding is a process of transferring milk from mother to infant [5] that is essential for the wholesome growth and survival of the infant into adulthood [6]. Breastfeeding has numerous benefits among which are: creates an inseparable psychosocial bond between the child and mother [7], improves cognitive development and it forms the basis of the wellbeing of an infant in the first year of life even into the second year of life with relevance complementary foods from 6 months [8]. Extensively, breastfeeding mitigates the risk of neonatal complications, pulmonary and several childhood diseases [9]. Breastfeeding has a great benefit on women health. Several researchers have reported that breastfeeding helps in reducing pregnancy weight rapidly [10-12]. A study shown that women who breastfed lost 4.4kg annually, while those who did not breastfeed only lost 2.4 kg ($P<0.05$) [13]. This emphasizes the effectiveness of breastfeeding especially if practiced exclusively in the first semester, in minimizing weight gain during conception.

Worldwide, breast milk has been acknowledged as the Gold Standard of baby feeding [14]. It supplies all the necessary nutrients essential for the growth and development of an infant and child [15,16]. In 2002, international organizations such as the World health organization and the United Nations Children's Fund jointly launched a global policy for infant and young child feeding. This policy stressed breastfeeding as the best and non-substitute practice of supplying infants with the ideal nutrients for optimal growth and development. This initiative is premise on the Innocenti Declaration (1990) and the Baby-Friendly Hospital Initiative (1991) which was programmes that helps to address the challenges encountered by low birth weight infants, infants in critical situations, and infants born to HIV mothers. It focused on breastfeeding as an essential practice in such situations to protect them from the detrimental effects of malnutrition and low immunity to enable them grow and attain their maximum potentials. The American Academy of Paediatrics [17] strongly approved exclusive breastfeeding in a historic policy statement. They recommended breastfeeding as a key practice and spelt out the various roles pediatricians can play in order to aggrandize the practice. Likewise in Africa, exclusive breastfeeding for six months has been prioritize, which should be followed by an introduction of nutrient dense complementary feeds for the next two years or more [15,18].

There is a wide range of discrepancy in exclusive breastfeeding practice in the third world countries, with documented rates being:

Lebanon (10.1%), Jordan (77%), Brazil (58%), Nigeria (20%), Bangalore (40%), Iran (Zahedan) (69%), Iran (28%), Beruwala (Kalutara) (15.5%), Bangladesh (34.5%) [19-23]. The factors that influence infant feeding are complex and differ from one place to another. Understanding these factors is paramount in addressing the dwindling breastfeeding rate. One of such contributory factor is inadequate knowledge among nursing mothers in West Africa of the nutritional composition of breast milk and its benefits to infants. Also, there is dearth of information in literature on the facilitators and barriers to exclusive breastfeeding in West Africa. Hence, the aims of this review are to:

1. Provide an overview on the human breast, with the physiology of milk production and supply;
2. Discuss the composition and characteristics of breast milk;
3. Appraise the benefits, facilitators and barriers to exclusive breastfeeding among nursing mothers in West Africa; and
4. Provide insight to the problems which hamper breastfeeding practice among mothers.

The human breast

The breast consists of connective, ductal, adipose and glandular tissue. Implanted in the fibrous tissue are lobules and fat which form the mammary glands, an accessory organ in female reproductive system, but rudimentary and functionless in men. In men, there is little deposition of fat in their breast, and the glandular system normally does not develop. In women, the breasts are the most conspicuous superficial structure on the anterior thoracic wall, and the quantity of fat in the glandular tissue influence the breasts size. A small portion of the breast often extends into the axilla, forming the axillary tail of Spence.

The breasts lie on the deep pectoral fascia (investing the pectoralis major) and the fascia of the serratus anterior. They are bounded by the clavicle superiorly, the lateral border of the latissimus muscle laterally, the sternum medially, and the inframammary fold inferiorly. The breast is attached to the dermis of the overlying skin by connective tissue structures known as Cooper's ligaments (aka suspensory ligaments or retinacula cutis), which suspend the breast on the chest wall. It is these ligaments which pull on the skin, creating the dimpling (or peau d'orange) associated with malignancy. The mammary glands are modified sweat glands and are composed of 15-20 lobules, each drained by a lactiferous duct. Each lactiferous duct independently drains on

the nipple and is preceded by a small dilated portion known as the lactiferous sinus. It is in the sinus that milk collects during nursing and is "let down" by the sucking action of the infant.

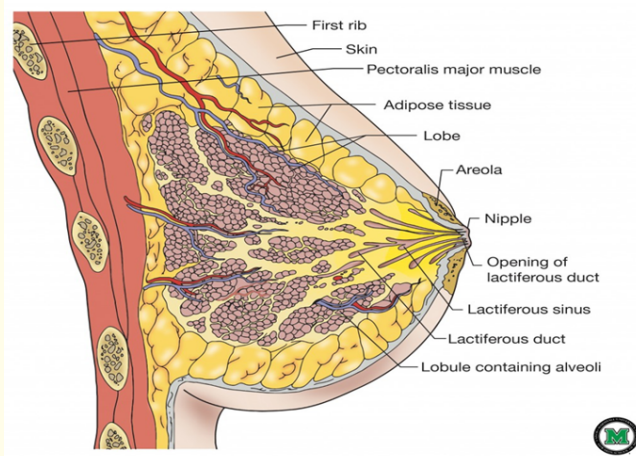


Figure 1: The human breast.

SHAPE AND POSITION OF FEMALE BREAST

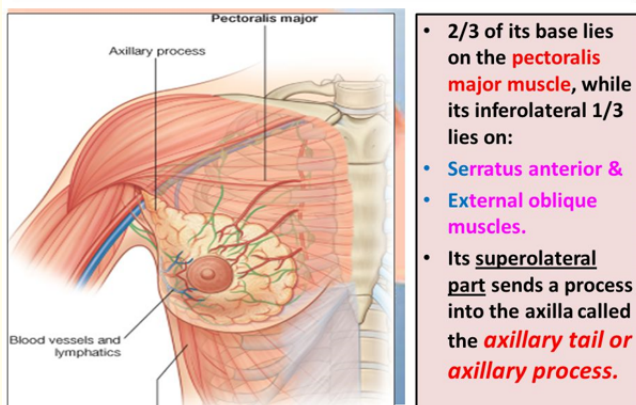


Figure 2: Diagram showing the shape and position of the female breast.

Structure of the Breast

The breast structure is quite intriguing and complicated; it is designed and programmed to secrete milk. Its structure consists of:

- The skin
- Parenchyma
- The Stroma

The Skin

The integument covers the breast just like in any other part of the body but it presents the following features:

The nipple or mammary papilla

This is a conical or cylindrical projection which is situated a little below the breast center. It forms the apex of the breast and sometimes in nulliferous females it over lies the 4th intercostal space. It is traversed by 15-20 lactiferous duct through which milk is secreted to the surface. It also consist of non-striated myocytes (smooth muscle cells), which are arranged circularly and longitudinally. The stimulation of the circular smooth muscle cells either by tactile stimulation or by sucking contracts, resulting in the erection of the nipple this function to open up the lactiferous duct in lactating mothers.

The contraction of the longitudinal smooth muscle cells result in the flattening of the nipple this also serve the purpose of closing up the lactiferous ducts in order to prevent the outflow of milk in lactating mother.

The Areolar

This refers to the highly pigmented region of the skin that encircles the base of the nipple. It is darker and highly pigmented in blacks and other melanized races but rose pink in Caucasian females. The pigmentation increases during the 2nd months of pregnancy resulting in a darker colour of which after delivery never returns to its original colour. Among the Caucasians, this phenomenon is of medicolegal importance. Modified sebaceous gland referred to as glands of Montgomery are peripherally arranged in the areolar. At the beginning of pregnancy, the areolar and nipple become slightly swollen and also the glands of Montgomery form cyst like structures called the tubercle of Montgomery. The secretions from this gland aid in the lubrication of the nipple and areolar thus preventing them from cracking in lactating mothers. The areolar and nipple lack hair and there are no fat underneath them.

The parenchyma

The parenchyma is the glandular tissue otherwise known as the milk producing tissue of the breast that consist of about 15-20 lobes, each lobe is consist of clusters of lobules and each lobule is made of clusters of alveoli. The lobes are drained by lactiferous ducts which lead into the rough ended tip of the nipple. At the base of the areolar, the lactiferous ducts expand forming the lactiferous sinus which functions as a milk reservoir during lactation.

The stroma

The supporting tissue of the breast is referred to as the stroma. It consists of adipose and fibrous tissues, the stroma is encapsulated by the subcutaneous tissue and from there septa emerge

joining the lobes and skin to the pectoral fascia thereby forming the suspensory ligament of Cooper. The main determinant of the breast size is the adipose tissue and their presence gives the breast its smooth appearance and contour.

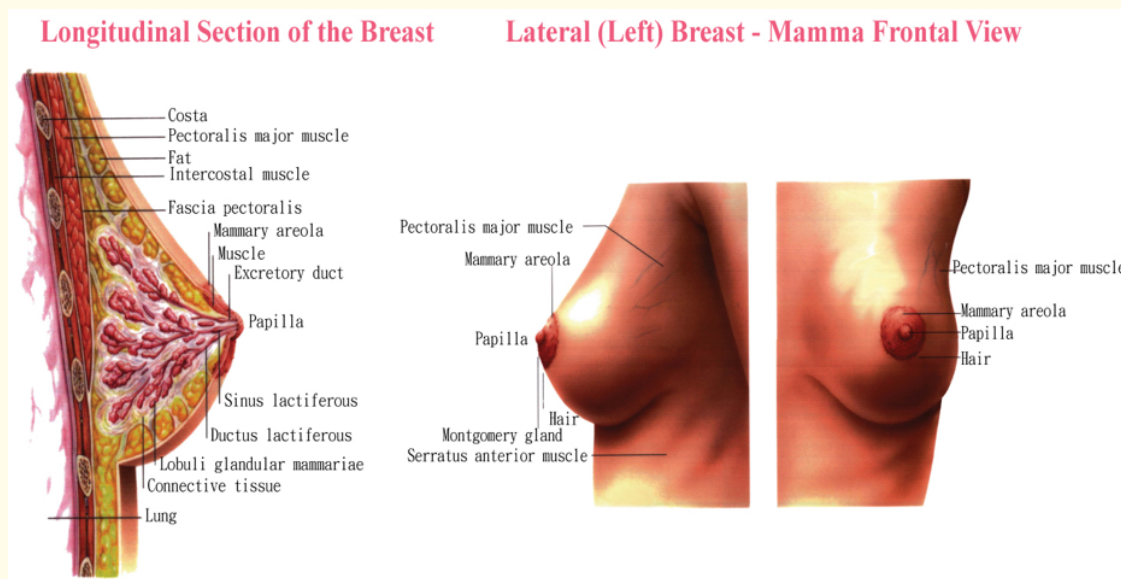


Figure 3: Different anatomical position view of the human breast.

Physiology of milk production and supply

Proper understanding of milk production by the breast can aid a mother in ensuring her baby get adequate milk from the breast. For instance, sometimes mothers have the notion that their babies had entirely drained their breast and that there is milk left, even though the baby wants to suck. Knowledge of the fact that milk is being constantly manufactured in the alveoli will boost the confidence of a mother to put her baby to the breast, even when it feels "empty." A study showed that babies sucked an average of only 76 percent of the available milk from their mother's breasts in a circadian rhythm [24].

Sucking of breast ensures continuous milk production. A baby's sucking sends signals to the brain, which then sends message to anterior pituitary gland to produce the hormone called oxytocin. Oxytocin causes the contraction of the muscle cells around the alveoli, thus forcing milk down through the ducts to the nipple. This movement of milk down the ducts is referred to as milk-ejection

reflex. Mothers may experience it as a sense of release in the breast or tingling feeling -- which is why it is also termed the "let-down." The let-down empties the alveoli and makes the milk available to the baby at the nipple. When the alveoli are empty, they respond by producing more milk. Recent research suggests that regulation of milk production is controlled by a special protein in human milk, called feedback inhibitor of lactation (FIL) [25]. When there is enormous milk in the breast, FIL inhibits, or prevents, the alveoli from secreting more. When milk is drained from the breast—and FIL is not available to impede milk production—the alveoli get busy and make more milk. This necessitates the importance of continuous nursing and breast sucking by baby as much as possible for optimal milk supply.

Another factor related to milk supply is the capacity of the breasts' storage. Sometimes small-breasted women often worry that they are not capable of producing enough milk for their babies, but the milk production process makes adjustments for breast

size. Smaller breasts may not be capable of storing as much milk between feedings as larger breasts, but if they are emptied often enough, they will manufacture much milk as the baby requires. Women with greater storage capacity and larger breasts are capable to go longer between feedings without affecting their supply. On

the contrary, women with smaller breasts may need to nurse more frequently since their breasts fill faster and milk production slows down as the alveoli become full. Frequent nursing is not only good for supply, but it is also a healthy habit that helps mothers avoid plugged ducts and breast infections.

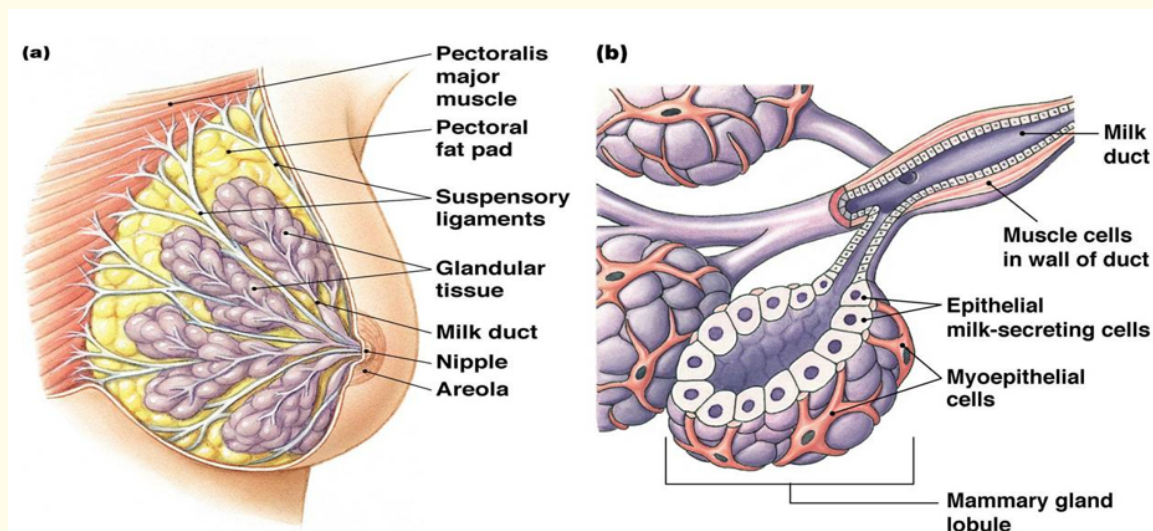


Figure 4: Physiology of milk production and supply of the human breast.

Composition of breast milk

Human milk is species-specific and far better than any other breast milk substitutes [26] and it is also presumed to be the most congenial infant food during the first 4 – 6 months, as it brings about optimal growth and development [27]. Human milk serves as the most natural food available for infant and is distinct

in that its nutritional composition differs from mother to mother, daily, during the day and during a feed [28]. Human milk contains several factors such as enzymes (e.g lysozymes), T lymphocytes, immunoglobulin, and phagocytes among others which are not found in breast milk substitute [29]. Table 1 show the comparison of composition of human colostrum, human mature milk, cow's milk and standard formula.

Nutrients	Human Colostrum	Human mature milk	Cow's milk	Standard formula
Kcal/100ml	67	67	67	67
CHO (Lactose – gm/dl)	5.7	7.1	4.7	7.0 -8.5
Protein (gm/dl)	2.9	1.06	3.1	1.5 – 2.2
Whey: casein	80: 20	0	18: 82	60: 40
Fat (gm/dl)	2.95	4.94	3.8	3.5 - 4.5
Sodium (g/l)	0.50	0.17	0.77	0.25
Potassium (g/l)	0.74	0.51	1.43	0.80
Chloride (g/l)	0.59	0.37	1.08	0.57
Calcium (g/l)	0.48	0.34	1.37	46 - 73

Phosphorus (g/l)	0.16	0.14	0.91	32 - 56
Calcium/Phosphorus	3.1	2.4	1.5	1.3 - 1.5
Magnesium (g/l)	0.04	0.03	0.13	5.6
Copper (mg/l)	1.34	0.51	0.10	0.40
Zinc (mg/l)	5.59	1.18	3.90	5.0
Iodine (mg/l)	0	0.06	0.08	0.01
Iron (mg/l)	1.0	0.50	0.45	0.15
Vitamin A (mg/l)	1.61	0.61	0.27	1.5
Vitamin D (IU)	0	4-100	5-40	41-50
Tocopherol (mg/l)	14.8	2.4	0.6	8.liu
Thiamine (mg/l)	0.02	0.14	0.43	0.47
Riboflavin (mg/l)	0.30	0.37	1.56	1.0
VitaminB ₆ (mg/l)	0.0	0.18	0.51	0.50
Nicotinic acid (mg/l)	0.75	1.83	0.74	6.7
Vitamin B ₁₂ (µg/l)	0.06	0.34	2.48	2.0
Pantothenic acid (mg/l)	1.83	2.46	3.4	3.0
Folic acid (µg/l)	5.0	14.0	90.0	10 - 13
Vitamin C (mg/l)	72	52	11	6.7
Osmolality	290 - 300	0	0	300 - 380

Table 1: Comparison of composition of human colostrum, human mature milk, cow's milk and standard formula [30].

Characteristics of breast milk

“Breast milk is distinct in its physical structure and types and concentrations of carbohydrate, fat, minerals, protein, and vitamins, hormones, enzymes, host resistance factors, growth factors, modulators and inducers of the immune system, and anti-inflammatory agents” [31]. Generally, milk can be classified into three (3) phases viz: colostrum, transitional milk and mature milk each with unique characteristics.

Infant's first milk (colostrum)

The first milk that is produced by the breast immediately after the birth of the baby is called colostrum; and this is a thick, yellow-coloured fluid colostrum. The yellow pigment is due to the high concentration of beta-carotene, a precursor of vitamin A which is required for early retinal development and for protection against infection [32]. It has also been reported that the quantity of colostrum available is limited but it is rich with substances and nutrients that the infant needs in the first few days of its life [31].

Colostrum which is referred to as the “liquid gold” is rich in fat-soluble vitamins, minerals, proteins, and immunoglobulins A- sIgA [27]. It worth noting, that IgA protects the baby's immune system by identifying and destroying foreign proteins or extraneous organisms such as viruses and bacteria [31]. Another benefit of colostrum is that the mother would loss less blood because as the baby suckle the uterine contracts. Moreover, colostrum helps to prevent the baby from infection as it contains white cells and it also has lactose which prevents hypoglycemia and equal enable the baby to pass meconium [32]. Consequently this promotes bilirubin excretion.

Transitional milk

Transitional milk referred to the postcolostral period (7 to 21 days post-partum) when milk composition changes more slowly than in the first few days following parturition. Transition milk is rich in high levels of fat, water-soluble vitamins, lactose, and is endowed with more calories than colostrum but its immunoglobulin level is lowered [27].

Mature milk

The milk that comes out of the mother's breast after 21 days post-partum is called mature milk and it also differs but to a lower extent than in early lactation [33]. This milk is paler, more watery and thinner than colostrum [27]. Furthermore, it contains 90% water which is helps to keep the baby hydrated while the remaining 10% consists of proteins, fats and carbohydrates which are essential for both growth and energy requirement of the infants. Mature milk is sub-divided into two types namely Fore-milk and hind- milk.

Fore-milk

Foremilk is the first milk available in enormous quantity at the onset of a feeding which is watery hence, supplying all the water needs of the infants. Based on this fact, the baby does required before 4 – 6 months of life any other drinks whether water or juice, even in hot climate [34]. Foremilk is endowed with lactose, proteins and other vital nutrients but contains less fat [27].

Hind-milk

Hind- milk is richer than fore milk, and it contains higher fat content, opaquer and creamier white in colour occurring after the initial release of milk [34]. This kind of milk induces a feeling of satiety in the baby, thus making the infant feels sleepy [31]. Therefore, both foremilk and hind-milk are essential to the baby as they supply optimum nutrition required for the proper growth and development of the infant.

Breastfeeding practices

The growth of a child is determined by several factors such as nutrition, environment, socio-economic status, lifestyle, infections, availability of medical care, genetic composition and family size [35]. However, the most paramount factor of all is nutrition because it can implicitly and explicitly influences the future development of a child. For example, malnourished and have-not children do not achieved good health and have impaired development in the long run [36]. Overweight and obesity in children are other factors of concern in children. Therefore, it is expedient that for an infant to achieve optimal health and well-being, a baby must receive proper nutrition and nurturing at the early stage of its life. Therefore, breast feeding remains the only golden gift an infant can receive from its mother.

"Breastfeeding is an unparalleled way of providing wholesome food for the optimal growth and development of infants; likewise is an integral component of the reproductive process with crucial implications for the wellbeing of the mother" [37].

Saha, *et al.* [38] gives the current and standard recommendations on breastfeeding endorsed by WHO and UNICEF as follows:

- Begin breastfeeding immediately or within the first hour of child birth;
- Exclusively breastfeed infant for the first six months;
- Practice breastfeeding for two years or more and proper initiation of complementary feeds beginning in the sixth month which are nutritionally wholesome and adequate.

Exclusive breastfeeding

According to WHO and UNICEF, exclusive breastfeeding is defined as the practice of giving infant only breast milk from the mother or a wet nurse or expressed breast milk [39]. Both international organisations recommend that mothers should exclusively breastfeed their baby for the first 6 months and continue breastfeeding up to 2 years or more rather than terminating EBF practice as from 4-6 months [40].

Although exclusively breastfeeding a baby for the first 6 months of life has huge advantages, several studies are focus on "weanling's dilemma" in the third world countries which involves choosing between the (theoretical) inadequate breast milk to supply the energy requirements of the infants and micronutrient needs beyond the age of four months and the immunity offer by exclusive breastfeeding against infectious diseases [41]. The researcher however claimed that there is no empirical evidence or data to show the estimate of the proportion of babies at risks of specific nutritional deficiencies who received exclusive breastfeeding.

Benefits of exclusive breastfeeding

Benefits to infants

Several studies have reported that exclusive breastfeeding of infants for the first six months of life is the standard for requirement for infant and young child to attain optimal growth and development. The merits of exclusive breastfeeding can be classified into three (3) modes namely: benefits to the child, mother and community. One of the benefits of exclusive breast

to a child is that it reduces the risk of pulmonary tract infection viz pneumonia in children [15,42]. Also, it has been observed by several researchers such as Aidam, *et al.* [43] and Aryeetey and Goh [44] that EBF reduce the risk of gastrointestinal infections such as acute watery diarrhea and gastroenteritis. This mitigation in the risk of acquiring infections has been attributed to the fact that breast milk boosts the child's immune system against numerous types of infections [42,44]. Aborigo, *et al.* [15] on the premise that exclusive breastfeeding boost a child's immune system reported that it reduces the risk of getting non-communicable diseases like hypertension and diabetes later in life by the child. It also mitigates the probability of acquiring ear infections as well as prevents recurrence of ear infections [42]. Another benefit of exclusive breastfeeding is that it offers protection from allergies [16]. Other studies have stressed that exclusive breastfeeding aids a child's cognitive development [23]. The Researchers argue that exclusive breastfeeding stimulates the brain and intellectual development of the child. Likewise, breast milk is copious, sterile and readily available compare to formula feeds [45]. Oche, *et al.* [45] argue that these attributes of breast milk makes it more beneficial as it's wholesome and cheaper than infant formula

Moreover, studies have reported that exclusive breastfeeding has a positive association with decrease in the morbidity and mortality of infants and children [42,45]. These findings were in consonance with that reported by Black, *et al.* [1] who found that exclusive breastfeeding decrease the rate of morbidity and mortality among infant and young children due to the fact that they build boosts the child immunity and consequently reduce the risk of infections

Benefits to the mother

Exclusive breastfeeding has also been found to be of great benefit to the breastfeeding mother. Breastfeeding mothers who exclusively breastfeed their children have greater tendency to shed more calories and regain their pre-pregnancy weight [10,15]. Likewise, mothers who exclusively breastfeed their children have their uterus also returns to normal size. Moreover, exclusive breastfeeding serves as a contraceptive method and help to prevents pregnancy by delaying menses in women. Hence, breastfeeding mothers who practice exclusive breastfeeding are able to space their children birth [10,15,45]. Another advantage

of EBF is that it strengthens the psychosocial bond between the child and the mother [8]. Also, it has been reported that women who practice exclusive breastfeeding usually have low incidence of type 2 diabetes as well as endometrial, ovarian and breast cancers. Likewise, a decrease in the risk of women to osteoporosis has been reported in the postmenopausal periods of mothers who exclusively breastfed their children [10].

Benefits to the community

The community derives its benefits from the wellbeing of children and mothers. Societies with an higher rates of exclusive breastfeeding tends to witness lower neonatal and infant death rates with a higher proportion of healthier mothers vis-à-vis communities where EBF is not practiced [15,42,45]. Likewise, communities in which a significant number of nursing mothers exclusively breastfeed their children, tends to encourages other women to follow suit [42,45]. This often leads to increase in the rate of exclusive breastfeeding with corresponding salubrious societies for both mothers and children.

Facilitators to exclusive breastfeeding

In spite of the huge benefits of exclusive breastfeeding, several nursing mothers exclusively breastfeed their infants for differ reasons. Agunbiade and Ogunleye [46] reported that in Southwestern Nigeria, some mothers practice exclusive breastfeeding due to the fact that they are aware that it helps newborns to grow and develop optimally. This finding is in line with studies by Otoo, *et al.* [47] in Ghana, who noticed that knowledge of breast milk containing essential nutrients including water necessary for the proper growth of a child encouraged most breastfeeding mothers tend to exclusively breastfeed for six month.

Another factor that influences the decision of mothers to practice exclusive breastfeeding is socio-economic status. Agho and co-workers noticed that mothers from high socioeconomic status were more likely to practice exclusive breastfeeding than their counterparts in the low socioeconomic class [42]. The Researchers attributed this to high level of literacy and being better informed about exclusive breastfeeding than their counterparts from low socioeconomic class with low literacy and poorly informed. Moreover, Agho, *et al.* [42] reported that mothers who attended antenatal care services during conception were more

likely to exclusively breastfeed their infants as essential messages on benefits of exclusive breastfeeding were delivered to them during antenatal care services. This finding agrees with studies by Lawoyin., *et al.* [48]. Another factor that positively influences exclusive breastfeeding is lactation counseling. Existing evidence presented by several West Africa researchers viz: Qureshi., *et al.* [49] in Nigeria, Aidam., *et al.* [43] and Otoo., *et al.* [47] in Ghana showed that lactation counseling has significantly association with increased in rates of exclusive breastfeeding. The Researchers observed that if pregnant women or mothers are informed adequately on exclusive breastfeeding benefits that they are more likely to exclusive breastfeed their infants than their peers who are not counseled. Also, another important factor which influences the decision of a nursing mother to practice exclusive breastfeeding is the place/location of delivery. Aborigo., *et al.* [15] observed that mothers whom delivery take place at home are less likely to practice exclusive breastfeeding compare to women who delivered at a health facility, such as in a hospital. Aborigo., *et al.* [15] and Qureshi., *et al.* [49] elucidated that mothers whose delivery take place in health facilities have higher propensity to practice exclusive breastfeeding than those whose delivery occurred at home. Furthermore, Otoo., *et al.* [47] noticed that previous experiences by nursing mothers such as death of the child, deformity or disability of the child etc. might trigger a mothers to exclusively breastfeed their children. For instance, Otoo., *et al.* [47] observed that a mother becomes advocator of exclusive breastfeeding and discourage other mothers from giving water during the first six months of exclusive breastfeeding. The reason she cited was that her giving water during exclusive breastfeeding make her elder child fall ill often, and this motivate her to give breast milk only with no other substitute when she had her second parity. Furthermore, some mothers tend to practice exclusive breastfeeding because it is easy, readily available and save time to carry other activities; as nursing mothers do not have to worry about the stress and time required to prepare baby formula.

Lastly other factor that motivates mothers to practice exclusive breastfeeding is the cost of baby formula which is on the high side [15,47]. Aborigo., *et al.* [15] and Otoo., *et al.* [47] reported that the higher the knowledge and awareness of exclusive breastfeeding by mothers, the greater the likelihood of them practicing it.

Barriers to exclusive breastfeeding

Although exclusive breastfeeding is attributed with several benefits which are sufficient motivation for mothers to practice it, yet, numerous mothers were reluctant or decline to exclusively breastfeed their children for various reasons. In Nigeria, Ogunlesi [50] found that although the initiation of exclusive breastfeeding is on the rise, the period of practice for six months continues to dwindling. Agunbiade and Ogunleye [46] observed that some nursing mothers in Nigeria had the notion that their breasts will become sag when they exclusively breast their infants hence making them sexually unattractive to their spouses, this deter them from practicing it. This agrees with the studies by Aborigo., *et al.* [15] in Ghana, where younger mothers for reason of not losing their breast shape, were found not practicing exclusive breastfeeding.

Another significant barrier to exclusive breastfeeding is socio-cultural beliefs and practices. For instance, Kakute., *et al.* [51] observed that mothers from some ethnic groups in rural Cameroon introduce water or food prior to six months of age, with about 40% introducing water to children in the first month of life. These had the notion that breast milk does not contain adequate diet that is necessary to increase the weight of an infant. This observation is in consonance with several other studies that perceived exclusive breastfeeding as unbalanced, inadequate and inhibit a child growth [16,47,52]. Also, cultural beliefs such as testing of breast milk for bitterness before administer it to the child influence most mothers not to exclusively breastfeed their infants [15]. The Researchers documented that black ants are put into the breast milk of a neonate mother; if these ants survive by crawling out, this symbolizes that the milk will be congenial to the infant. One the contrary if the ants does not survive in the milk, this implies that the milk is poisonous and inimical to the health of the child, such a mother undergoes some ritual rites before the breast milk can be detoxify and given to the neophyte [15]. Consequently such child lives on water and other feeds until the completion of the ritual. Additionally, several authors in sub-Saharan African had reported that the tradition of given water to neonate to quench their thirst is also a debilitating factors to the practice of exclusive breastfeeding by mothers [16,47-52]. The authors noticed that newborns were given liquid such as water and other concoctions to quench their thirst and as symbol of welcoming them into the world.

Another factor that is reported to have negative influence on exclusive breastfeeding practice is pressures from families on breastfeeding mothers. Kakute., *et al.* [51] reported that mothers practised mix-feeding due to families' pressures and traditional notions. For example, Kakute., *et al.* [51] observed that mothers in rural Cameroon were pressurized by family to feed their newborns with food because they considered it as a taboo not to give neonates food grown by the family.

Also, the literacy level of nursing mothers has been reported to greatly influence the mothers' decision to practiced exclusive breastfeed [49,52]. Mothers who had no Western education are less likely to practice exclusive breastfeeding compare to their peers with higher education due to the fact that illiterate mothers are less informed about the benefits of exclusive breastfeeding compared to their counterparts with higher education [49]. Other studies have found that some mothers have engorged breast or cracked nipples that cause them pain during breastfeeding hence; they do not practice exclusive breastfeeding. Moreover, mothers who delivered at home are less likely to exclusive breastfeed than their counterparts who delivered at a health facility as they are not opportune to get lactation counseling [43].

Problems with breastfeeding

Among mammals, it is only in the species *Homo sapiens* that breastfeeding and weaning are not governed by instinct but have to be learned [53] and problems of breastfeeding problems occur frequently, but does not last for long and are avoidable [48]. Based on the findings of Giugliani [53], several mothers are having breastfeeding challenges due to the fact that they are losing their traditional source of learning as nuclear families are now replacing extended families. This avail mothers few privileges of learning about breastfeeding. Thus, prevention and treatment are recommended in order to enable a nursing mother to begin or continue enjoying the lactation process.

Breast engorgement

Infrequent or ineffective milk removal is the main cause of breast engorgement [32]. Within 3-5 days postpartum the breasts become engorged [54]. The breasts become warm, full and at the period when the "milk comes in" at 3-5 days after delivery, there is a fast rise in the volume of milk that result in vascular congestion which is followed by oedema [32].

Sore nipples/ nipple trauma

Sore nipples are one of the main reasons why nursing mothers opt out of breastfeeding and settle for early weaning [55]. This problem usually occurs during the first week or two when the baby is latching and consequently makes mothers feel discomfort and mild pain.

Teaching mothers proper techniques on the breastfeeding initiation can help prevented sore nipples [56]. Moreover, after feeding, the breast should be allowed to air-dry for some minutes couple with frequent changing of nursing pads could help prevent milk flow [53,54]. Other precautionary measures include avoiding the use of extra water, alcohol and soap on the breast; and expressing breast milk if the breasts are engorged [54].

Insufficiency of milk

Another reason responsible for early termination of breastfeeding is inadequate breast milk [57]. Majority of nursing mothers secrete milk suffice for the baby's needs, nevertheless, the remonstrations of "insufficient milk" is not based on only wrong perception by the mother but the latter is devoid of confidence on her ability to breastfeed an infant [53]. Several other reasons such as psychological inhibition, smoking, conditions of the baby, such as illness or ankyloglossia, pregnancy, ineffective suckling and/or infrequent feeding routines, pregnancy, condition of the mother such as fatigue, stress, and use of certain medications makes mothers have the notion that they are not secreting "sufficient milk" [32]. Hence, it is consequential to find out the cause of the milk inadequacy so as to identify essential solutions to the problem.

Many mothers experience several other problems such as medical complications (e.g. mastitis, breast abscess etc), flat/inverted nipples, gigantomastia, and plugged ducts during the process of lactation [55].

Conclusion

The gold standard of feeding an infant in its first six months of life is breastfeeding. It remains the most cost effective way of mitigating the rate of morbidity and mortality among under-five children. Breast milk has a higher nutritional content vis-à-vis cow's milk and other infant formulas. Several factors such as sore nipples/nipple trauma, milk insufficiency, breast engorgement and

infant formulas availability influence breastfeeding practice in terms of initiation, exclusivity and duration in Sub-Saharan Africa. Although the findings of this paper revealed some intriguing factors for exclusive breastfeeding, greater efforts still need to be demonstrated to promote exclusive breastfeeding among nursing mothers as they are faced with huge challenges.

Conclusively, in order to aggrandize exclusive breastfeeding in West Africa countries, policy and programme interventions should target women at community level. These interventional programmes should aim at correcting the misconceptions surrounding exclusive breastfeeding practice and also stress the benefits of exclusive breastfeeding. This review opined that disseminating programmes on the awareness and importance of exclusive breastfeeding among mothers at community level should involve crucial key players such as husbands, mother-in-laws, community leaders, and health care workers as they often influence in the decision of a mother to exclusively breastfeed.

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Conflict of Interest

The authors declare no conflict of interest.

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