

# Feeding and care of low-birthweight babies in two rural communities in south-western Nigeria

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### Abstract

The aim of this cross-sectional study was to highlight the sociocultural beliefs and practices relating to the care and feeding of low-birthweight (LBW) babies in two rural communities in the south-west of Nigeria. Data from 60 mothers and their newborns and community care providers were collected using qualitative instruments. The 60 mothers [30 mothers of LBW and 30 of normal-birthweight (NBW) infants] were identified through key informants, snowball approach and information obtained from community healthcare providers. The mean weight at recruitment of the LBW and NBW babies studied was  $1680 \pm 440$  and  $2990 \pm 450$  g respectively. Only two of the 60 mothers in the study delivered in orthodox health facilities, because in most cases these facilities were unaffordable, inaccessible and incompatible with rural lifestyles/beliefs. Most of the mothers believed that exclusive breastfeeding was not adequate for the LBW babies, and so herbal mixtures believed to accelerate growth were given in addition to breast milk. The use of forced hand-feeding and feeding bottles was universal among the mothers of LBW babies in order to 'increase the volume of feeds the baby gets'. Herbal dressing was used for cord and anterior fontanel care, while the babies were kept warm by using extra clothing, lighted lanterns and shutting of the windows. Five (16.7%) LBW infants and 1 (3.3%) NBW baby died, while 12 (40%) LBW, compared with 4 (13.3%) NBW infants, were hospitalized during the study. The findings of this study serve to identify the cultural beliefs and values around the care of LBW infants. Interventions designed to improve neonatal survival must therefore, take cognizance of these beliefs, customs and practices, in order to ensure effective and proper care of the LBW infants.

*Keywords:* feeding, care, low-birthweight babies, rural communities.

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## Introduction

It is well documented that in rural Yoruba communities, community care providers have food prescriptions and taboos for pregnant mothers to ensure positive pregnancy outcomes (Odebiyi 1989; NPC and ORC Macro 2004). These food taboos have been linked with impaired growth in the womb, a condition that predisposes infants to low birthweight (LBW) and other complications. Other factors that have been found to influence birthweight are lack of antenatal care, short birth intervals, low maternal education, grand multiparity, short maternal stature due to mother's own childhood undernutrition, low socio-economic status, and chronic maternal illnesses such as heart and renal diseases (Tibrewala *et al.* 1980; Chukwudi *et al.* 2002).

It has been shown that birthweight is an important determinant of childhood survival (Wilcox & Russel 1983). In fact, LBW is responsible for 60–80% of neonatal deaths although it accounts for only 14% of the children born in developing countries (Bang *et al.* 2002), and thus contributes significantly to infant mortality rate (Lawn *et al.* 2005).

Ninety-five per cent of the LBW babies born every year in the world are from developing countries, and it is unfortunate that most deliveries in these countries take place in the rural communities, where babies are usually not weighed (Lawn *et al.* 2005). Hence, the incidence of LBW may even be under-reported. It is, therefore, difficult to assess the real impact of these deaths on the country's development efforts. Of significance, however, are the psychosocial effects, the stress and the anxiety of a family in caring for a sick neonate within a system that places high premium on children. The need to address this health problem cannot be overemphasized, especially as the facilities for caring for such babies are either non-existent or inadequate. This study set out to collect information on the care and feeding practices of newborns, particularly the LBW infants, from those who are directly involved in the acts (the mothers and other rural caregivers), so that the realities on ground can be captured and future interventions will address the issues appropriately.

Issues addressed included: the steps taken by mothers to care for LBW infants and the rationale for

their actions; the belief and knowledge of other caregivers about exclusive breastfeeding (EBF) in enhancing the growth of the LBW infants; and whether or not rural caregivers perceive LBW infants as 'high risk' like their urban counterparts.

## Methods

### Description of study area

Ekiti State in south-western Nigeria is inhabited by the Ekitis, a sub-Yoruba ethnic group. The state was purposively selected for the study because it is one of the six poorest states in Nigeria (NPC and ORC Macro 2004). Two towns in this state, Emure and Efon-Alaye, were purposively selected based on their level of poverty as assessed by the authors. The authors based their assessment on the degree of facilities/resources existing on ground. These towns appeared to be suitable for the study because there is a direct link between poverty, child nutrition, survival and LBW; and also because of its proximity to the researchers' base.

### Study design and sampling technique

A cross-sectional design was used for the study. For the data collection, Table 1 shows the variety of qualitative techniques used. These were triangulated not only to provide more insight into the feeding and care of LBW babies in the selected communities, but also to enhance the validity of the data. In order to identify mothers with newborns, information was obtained from traditional birth attendants (TBAs), traditional healers (TRDHs) and staff of spiritual birthing homes (SBHs), and from members of the communities (as deliveries are joyous events publicly celebrated on the eighth day). This was complemented with the snowball technique, in which an identified mother was asked to mention another mother with a newborn baby known to her. Through this technique, the field assistants who lived within the community were able to track down the mothers with newborn infants (aged 0–7 days) and to stratify them according to the sizes of their babies. The field workers who were indigenes of the communities had been trained on

**Table 1.** Size of study population per instrument

Type of research instrument	Efon-Alaye community	Emure community
<i>Household survey</i>		
Questionnaire		
Mothers of LBW infants	15	15
Mothers of normal-sized infants	15	15
<i>In-depth interviews</i>		
Interview schedule		
Traditional healers	1 (male)	1 (male)
TBAs	2 (all females)	2 (all females)
Staff of spiritual birthing homes	2 (all females)	2 (all females)
Western orthodox nurses/midwives	1 (female)	1 (female)
<i>FGDs</i>		
FGD guide	2 (1 for elderly males: composition 10; 1 for elderly females: composition 13)	2 (1 for elderly males: composition 8; 1 for elderly females: composition 11)
<i>Case studies</i>		
Questionnaire	2 (parents – paternal grandmother and the father of LBW infants, and the paternal grandmother and the father of normal-sized infants)	2 (parents – maternal grandmother and the father of the LBW infants, and maternal grandmother and the father of normal-sized infant)
Observation schedule	Same families	Same families
Total number of respondents	63 (13 males, 50 females)	59 (11 males, 48 females)

FGD, focus group discussion; LBW, low birthweight; TBA, traditional birth attendant.

how to differentiate between the LBW and normal-birthweight (NBW) infants by the consultant paediatrician in the team. Moreover, they were provided with weighing scales after the training so that they could accurately determine the weights of the infants, especially as some of the mothers had their babies at home. NBW babies weigh 2500 g or more, while LBW babies weigh less than 2500 g. In each stratum, a total of 15 women were interviewed, thus making a total of 30 women per community (15 of LBW and 15 of NBW infants) and an overall total of 60 from the two communities. For household survey, semi-structured questionnaires were used to document the central caregivers' (mothers', if alive, or grandmothers') perception, attitudes and knowledge base of LBW babies in terms of care and feeding. Other data gathering techniques used among different groups of respondents are shown in Table 1.

The paediatrician in the team took the anthropometric measurements of all the infants at recruitment and thereafter monthly, and followed up their clinical progress. Sick babies were identified and referred to the nearest health facility. The clinical outcome of all the infants was documented.

Efforts were made to ensure proper supervision of the fieldwork and the involvement of all stakeholders. The supervision ran through the various activities. All the research instruments were translated to the local dialect of the Ekitis, and were pretested by field workers. Consent was obtained at the level of the local government authority, communities, households and individuals. Written consent was obtained from literate mothers, while illiterate mothers thumb printed the ethical consent forms.

Statistical Package for Social Science (SPSS) for Windows Release 11.0 was used in the analysis of the quantitative section of the semi-structured questionnaire, while the content analysis of the qualitative data was performed using the TEXT BASE BETA computer package.

## Results

A total of 60 mothers (30 mothers of LBW and 30 mothers of NBW infants) were surveyed in both Emure and Efon rural communities in Ekiti State, Nigeria, from May to mid-August 2003. Two of the 60 mothers in the study delivered in orthodox health

facilities. Most (83.3%) of them claimed that they could not afford the hospital charges. Some (48.3%) mothers claimed that the health facilities were inaccessible particularly at night, when most of them fell into labour, and the practices in the facilities were incompatible with their lifestyles/beliefs. These beliefs included the use of incantations and herbal mixtures by TBAs and TRDHs at the onset of labour.

### Characteristics of the mothers

Table 2 shows the characteristics of the mothers of the newborns in the study. The mothers of NBW babies

were younger and more educated than their counterparts with LBW babies, even though this was not statistically significant. The predominant occupation among mothers of both birth statuses was petty trading. All the mothers of the babies were married except 6.7% who were mothers of LBW infants and were teenagers.

### Infant anthropometry, morbidity and mortality

Table 3 shows the range and mean weight of the babies at recruitment. Table 3 also shows that 12 (40%) of the 30 LBW babies and 4 (13.3%) of the 30 NBW infants

**Table 2.** Characteristics of the mothers and newborns in the study

Characteristic	Mothers		P-value
	NBW	LBW	
Age (years)			
Range	20–40	16–35	
Mean $\pm$ SD	26.4 $\pm$ 5.7	27.8 $\pm$ 5.7	<i>t</i> -test, $P = 0.053$
Educational background			
Less than secondary education	18 (60%)	23 (76.7%)	$\chi^2 = 1.93$ , d.f. = 1, $P = 0.17$
Completed at least secondary education	12 (40%)	7 (23.3%)	
Occupation			
Unemployed	3 (10.0%)	8 (26.7%)	Fisher exact, $P = 0.06$
Farming	4 (13.3%)	5 (16.7%)	
Petty trading	11 (36.7%)	13 (43.3%)	
Artisan	4 (13.3%)	0 (0%)	
White-collar jobs (clerks/secretary)	6 (20.0%)	1 (3.3%)	
Professionals (teachers)	2 (6.7%)	3 (10.0%)	
Marital status			
Married	30 (100%)	26 (86.7%)	Fisher exact, $P = 0.06$
Single	0 (0%)	4 (13.3%)	
Type of household			
Monogamous	18 (60%)	23 (76.7%)	$\chi^2 = 1.93$ , d.f. = 1, $P = 0.17$
Polygamous	12 (40%)	7 (23.3%)	

$P \leq 0.05$  is statistically significant. LBW, low birthweight; NBW, normal birthweight.

**Table 3.** Infant anthropometry, morbidity and mortality

Variable	Low-birthweight infants ( $n = 30$ )	Normal-birthweight infants ( $n = 30$ )
Weight (g)		
Range	800–2450	2500–4250
Mean $\pm$ SD	1680 $\pm$ 440	2990 $\pm$ 450
Number hospitalized	12 (40.0%)	4 (13.3%)
Number of deaths	5 (16.7%)	1 (3.3%)

were hospitalized during the study. The causes of death in the LBW infants included extreme prematurity, gastroenteritis, pneumonia and obstructed hernia, while the NBW infant died of asphyxia.

## Feeding of the LBW infants

### Initiation of feeding and the use of colostrum

In the two communities studied, 91.7% of the mothers (mothers of LBW and NBW babies) believed that all babies should be given water or herbal mixture as the first meal or drink. These, they believed, would cleanse the baby's bowel and prepare the baby for milk and cereals. Also some (46.7%) mothers believed that breast milk is not available until the third day after birth and so the babies must be fed with glucose added to water. The focus group discussions (FGDs) also showed that water must be given to the baby while waiting for the mother to lactate. For example, it was commonly mentioned that most women take 2 or more days to start lactating.

Most (75%) of the mothers claimed that the newborn baby (LBW or NBW) would need to be rested before commencing feeding and the rest period could be as long as 24 h after birth. One of the women in the FGDs provided the reason for this belief, and she had this to say,

The delivery process is a very stressful one for the child and he needs to be allowed to rest for at least a day before being disturbed. In this case activities like feeding which can wait should be delayed . . .

Most (88.3%) of the mothers did not give their babies colostrum because they believed that it was not good for the babies and could lead to infection. This was supported by the response of most participants of the FGDs.

### EBF and frequency of feeding

Most (91.7%) of the mothers stated that breast milk was an important source of nutrient for the LBW infants because it is germ free and ensures growth of the child. All the mothers and most of the community care providers believed that babies should be fed as

often as they (the babies) want. The food types recommended by the mothers for babies in the first few months of life included EBF and breast milk supplemented with water, herbal mixtures or cereals, depending largely on the weights of the babies. The types of food recommended for LBW babies varied between the mothers of LBW and NBW babies. For example, while 66.7% of the mothers of NBW babies recommended EBF for LBW babies, only 36.7% of the mothers of LBW infants expressed the same view. In most cases, the women believed that for the LBW babies to survive, they must be aided with natural herbs and other food supplements other than breast milk. A common trend that emerges from the data is that mothers practised EBF when a child is seen as having a 'normal' or fairly acceptable size, whereas, when a baby is perceived as being 'overweight' (very big/big babies), or LBW ('very small sized' babies), mothers introduced food supplements to the child early in life (especially in form of herbal mixtures) which could help the child to either 'lose' or 'gain' weight. Also cereals are introduced early to the LBW infants to further enhance their growth. The mothers believed that an infant's weight can hinder or slow down the developmental processes; hence, 'very big' infants must be purged by the use of herbs to reduce their weights. For the LBW infants 'agbo amomowu', literally meaning 'weight enhancing herbs', are regularly administered to ensure rapid weight gain.

Mothers expressed their belief in the efficacy of water as a natural food for infants, which could sometimes be used to overcome some health conditions. In some of the FGD sessions, the elderly women expressed the view that water in the early life helps 'clear the infants' bowels' and must be used regularly to prevent or stop hiccups. Also, the use of herbal mixtures for very big and small babies was also stressed, thus complementing the responses from the interviews.

FGD findings and the interviews with mothers showed that EBF is not popular in both towns for LBW infants. Participants in the FGDs in Efon-Alaye believed that breastfeeding is necessary but not sufficient. They stated that while breastfeeding provides the milk, herbs should also be administered to prevent sickness and promote rapid growth, par-

ticularly in LBW infants. A female participant in Efon-Alaye had this to say,

From my own experience, the herbal mixture is more effective than breast milk for the rapid growth of LBW infants. I am not saying breast milk should not be given to them but more attention should be on the herbal mixture.

The FGDs in Emure further attested to the fact that even though breastfeeding is being practised, it is not acceptable as an adequate 'catch-up' strategy. The in-depth interviews conducted with the care providers, on EBF and whether or not they advise mothers of LBW infants to practise it, revealed that EBF was not a popular practice and was not promoted by the different care providers. TRDHs and TBAs, for instance, placed more emphasis on use of local herbs which will not only provide nutrient for growth but also *ward off evil spirits*. The SBHs complement breastfeeding with use of 'holy water'. Also, one of the two Western orthodox staff (WOS) stated that it should be complemented with water, while the other believed in EBF as an adequate and sufficient feeding technique.

#### Feeding methods adopted by mothers

The different feeding methods as stated by the mothers were forced hand-feeding, feeding bottle, cup and spoon or spoon alone, but the choice of the method of feeding is determined by the size of the infant. The practice in the community as stated by the mothers is the use of a small spoon for the feeding of the smallest of the LBW babies who is being taught how to feed, while the intermediate-sized LBW infant is fed using cup and spoon, and feeding bottle with a small teat. The heavier LBW infants are forced fed and sometimes feeding bottles are used. As the LBW infants improve in size, most mothers recommended the use of feeding bottles and forced hand-feeding to 'enhance adequate intake of feeds'. This was corroborated by the FGDs with the elderly women and case studies of LBW infants.

#### Use of expressed breast milk and surrogate mothers

Most (80%) of the mothers interviewed would not express breast milk for their babies when separated

from the baby. Most of them felt that this was not culturally acceptable. The reason for these beliefs was provided by the elderly women in the FGDs and the interview of the community care providers. According to them, breast milk outside the body goes bad and could be poisoned by the *mother's enemy*, causing death of the baby. A majority (83.3%) of the caregivers, including the WOS, would prefer their relations and co-wife to breastfeed their LBW infants when they are not around. When community care providers were asked about the risk of transmitting disease from a surrogate mother to the baby, the responses were summarized by one of the care providers as follows:

All relatives carry the same type of disease in their body and if a relation has a disease it is likely to be present in the mother of the child as well.

#### Care of the LBW babies

In response to the question of how to enhance the growth and survival of LBW infants, all the mothers interviewed in the two communities emphasized the need to keep the infants warm, regular feeding, use of herbs, use of daily drugs (orthodox and traditional), and the need to take such babies to the care providers regularly. When the mothers were asked specifically how they would provide warmth for LBW infants, their responses to this question varied. A majority (91.7%) of the mothers suggested the use of extra clothing/blankets, warming up the rooms by the use of lighted lanterns, or making fire in the room and shutting of all windows at all times. A few (20%) of the mothers suggested backing of infant, because it is generally believed that mothers' backs generate heat, which can help in keeping their baby warm. FGDs with elderly women revealed that mothers were also forced to take only hot foods and drinks, so that their breast milk will not only flow well but will be warm and help keep the newborn warm as well.

The FGD with elderly women further revealed that once a baby is born, particularly LBW infant, palm oil is rubbed on the body and in-between the folds to prevent body odour later in life. After this, the baby is given a bath with warm herbal mixtures, and hence forth, the baby is bathed thrice a day to prevent body odour in adulthood. Observation data from the case

studies further confirmed these frequent baths. Also in Emure, mothers and their babies in the majority of cases slept on a mat on an uncemented floor, and the baby's body is allowed to touch the mother's as it is believed that the *heartbeat of the mother helps to remind the LBW infants to breath*. The in-depth interview of care providers also showed that all the water used in bathing the LBW infants must be kept in a pot until the infant is considered of age (sufficiently big) before it is poured off. This is to enhance the survival of the LBW infants.

For the care of the cord, most (75%) mothers mentioned fomentation with dry heat, application of white powder and bandaging so as to prevent infection. All care providers would also give herbal mixture (*agbo inu*) to the infant every day until the cord stump is healed.

The general trend in the four FGDs showed that most respondents believed that LBW babies need special care because they are highly sensitive to any form of discomfort. The general opinion is that specific types of traditional herbs should be used to enhance the growth of LBW babies, such as Agbo 'apo'. Other forms of care mentioned include the wearing of charms (amulets) on the neck and wrist of the infants to ward off evil spirits, and the burning of incense in the room where the LBW is kept. It is interesting to note that the staff of SBHs also wear a set of keys (seven) around the babies' neck to ward off evil spirits. This is particularly common in Emure.

The most frequently recommended care for the fontanel by all caregivers is regular oiling and giving 'agbo oka ori' daily to the infants. In addition, TRDHs and TBAs would apply native herbs ('agbo awuje') to prevent evil spirits from entering the child's body through the fontanel.

Generally, mothers reported that it is very stressful taking care of the LBW babies. Some of these stressful conditions were identified as frequent feeding, uncertainty about the chances of survival of the infant, and prolonged restriction of their own movements and activities. Some (50%) of the mothers also mentioned lack of adequate knowledge of the appropriate types of care needed by such babies.

In terms of the common health problems they experience and for which they seek medical/

traditional assistance, the mothers identified five different conditions in such infants. These were fever, diarrhoea, jaundice, discharge from the cord and depressed fontanel ('oka ori'). It is important to note that 60% of the mothers of NBW babies (compared with 33.3% of the mothers of LBW babies) stated that they would seek orthodox medical assistance for most of the conditions listed. This is because mothers of LBW infants believed that ill-health in LBW infants is better managed spiritually either by the use of prayers or using incantations and herbal mixtures. The most commonly mentioned ailment in LBW infants, according to the care providers, is frequent stooling/diarrhoea. Nine out of the 12 care providers interviewed in the two communities, including the WOS, mentioned this. The next most frequently mentioned was 'oka ori' (depressed fontanel), which they stated must not be allowed to dry and must be oiled as often as possible. Jaundice and excessive crying, which was attributed to either worms or evil spirits, were the next frequently mentioned conditions by most of the care providers. Eye discharge was mentioned as a common complaint by mothers of LBW infants. In treating most of these ailments, the SBHs used *blessed* water, prayers and reading of psalms. For the worms, most of the care providers used herbs, and they make some scarifications to stop severe pains from abdominal colic. All the caregivers except the SBH and WOS will treat jaundice by bathing and feeding the LBW infants with herbal mixtures made of pawpaw leaves. A staff member of the SBHs mentioned the practice of opening the infant's eyes to the early morning sun in the treatment of jaundice. The WOS recommended the use of antibiotics and glucose water as treatment for jaundice. Most of the care providers would withhold feeding in all newborns with diarrhoea, while the WOS will use oral rehydration solution in addition. All the care providers, including the WOS, believed that the use of mother's breast milk was appropriate in treating eye discharge.

## Discussion

In Nigeria, as in most developing countries, the neonatal death rate in rural communities (60/1000 live births) is almost twice the rate in urban communities

(NPC and ORC Macro 2004). LBW accounts for a substantial part of this mortality (Lawn *et al.* 2005). Interventions designed to change neonatal care practices must take into account the practices that are locally believed to be beneficial or risky during this period. This study has described the social and cultural context in which care of the neonate, especially the LBW, is provided in two rural communities in Nigeria. The age, occupation and educational backgrounds of the mothers of the LBW and NBW infants were similar, although it should be noted that most rural women are not knowledgeable of their age and only provide rough estimates, which may be far from reality. The study revealed some traditional harmful practices in the care of LBW infants which predispose these infants to unnecessary deaths.

Exclusive breastfeeding in the first 6 months of life is the gold standard in human nutrition and an important component in child survival. The LBW infant has been shown to have a higher risk of dying from malnutrition and infections such as diarrhoea and respiratory tract infection. Breast milk is not only sufficient for growth, but also protects against infections (Koletzko *et al.* 2000). In spite of this, the practice of EBF, as shown in this study, has always been low among rural dwellers in Nigeria, where the prevalence of LBW infants is high (Nwankwo & Brieger 2002; NPC and ORC Macro 2004). It is surprising that more than a decade since the Baby Friendly Hospital Initiative was introduced in Nigeria by the World Health Organization and UNICEF, there have not been many changes recorded in the feeding pattern of neonates in rural communities (Davies-Adetugbo 1997).

Unfortunately, the introduction of other fluids and food because of the assumption that breast milk is insufficient for the growth of the LBW infant, as seen in the study, has also been documented to be widespread (Davies-Adetugbo 1997; Nwankwo & Brieger 2002; Sibeko *et al.* 2005). Supplementation of breast milk with water or herbal mixtures has been associated with a decrease in the intake of breast milk, which may lead to malnutrition. Local weaning foods have been reported to be associated with bacterial contamination (Ikeh *et al.* 2001), and early introduction of bacteria into the LBW infants is most likely to lead to infection, particularly diarrhoea, with its atten-

dant complications. It is therefore not surprising that stooling (diarrhoea) was the commonest ailment seen by caregivers among LBW babies in these communities. It is important that messages on the benefits of EBF are included in health education programmes to mothers and community care providers, especially as this is the only way that the maximal benefits of breastfeeding can be derived.

The use of herbal mixtures as food or drink for improving the survival rate and 'spiritual protection' of the LBW infant is similar to the findings of other workers (Davies-Adetugbo 1997; Sibeko *et al.* 2005). This finding has public health implications and must be addressed in any intervention aimed at improving feeding practices in the studied communities. These herbs have not been screened for potency and toxicity; one then wonders how the correct dose for the infant is determined. Some of these infants died at home, and autopsy was not performed. Although one cannot conclude that any of the deaths was due to overdose of these herbs, toxicity has been reported in some children (Narayanan *et al.* 1983). Ekiti is one of the poorest states in Nigeria and, therefore, it was not surprising that commercial infant formula was not a common supplementary food as seen among urban dwellers in Nigeria and other countries (NPC and ORC Macro 2004; Sibeko *et al.* 2005).

The advantages of colostrum have been shown to include anti-infective properties and laxative effect which helps in early passage of meconium, thus reducing the incidence of jaundice. In spite of these advantages, our study revealed that this useful milk is not given to LBW babies, who would have benefited most from it. This finding is in keeping with the reports of Davies-Adetugbo's (1997) study in Nigeria, even though at variance with the findings of Sibeko *et al.* (2005) in South Africa. This finding may be responsible for the late initiation of breastfeeding in the communities studied. Early initiation of breastfeeding has been associated with successful and longer duration of breastfeeding. It is, therefore, important that interventions aimed at improving neonatal survival must be able to demonstrate the potential benefits of colostrum to mothers and other care providers in these communities. Davies-Adetugbo *et al.* (1997) have demonstrated that these practices are amenable



to change if intervention packages are carefully designed.

Also, the method of force-feeding among LBW infants as seen in this study has been reported by other workers in rural communities (Narayanan *et al.* 1983; Buffin 1994), and there is an urgent need to discourage this practice because it has been associated with aspiration pneumonia (Buffin 1994). The use of feeding bottles has not only been associated with nipple confusion, which affects the ability of the neonate to suck from the breast, it has also been associated with recurrent ear infection and diarrhoea diseases (Brown & Magnuson 2000). The poor hygiene and lack of safe water in the studied communities would make adequate cleaning of feeding bottles difficult with resultant transmission of infection to the neonate.

Although most caregivers in this study frowned at the use of expressed breast milk, they accepted the use of surrogate mothers for babies who have to be separated from their mothers. The use of surrogate mothers, which is an acceptable option, has the potential of transmitting infectious agents such as hepatitis and HIV (if the mothers are not screened for these infections), whereas expressed breast milk is devoid of this (Sidley 2005). There is, therefore, an urgent need for intervention in these communities to avoid starving of LBW infants or avoidable transmission of infectious diseases.

This study showed that care providers in the studied community are aware of the dangers of cold in the LBW infant, as efforts were made to provide warmth. This is important because LBW babies are known to die from cold, as they lack the ability to maintain their body temperature. However, the provision of warmth by the use of lighted lanterns near the baby is neither hygienic nor safe, and it has been responsible for burns in LBW babies (Owa *et al.* 1995). Also, the shutting of all windows and doors, coupled with burning of incense/wood in the rooms, makes the air stuffy and may be responsible for the common prevalence of respiratory infections such as pneumonia, which was responsible for the death of some of these infants. Likewise, the care of the umbilical cord in all babies is an important way of preventing infections in the newborn. However, fomentation of the cord using dry heat (which was stressed by a

majority of the mothers) has been associated with infections of the abdominal wall (omphalitis). The practice of expressing breast milk into the eyes of babies with eye discharge is almost universal in Nigeria, even though it is commoner in the rural communities. In view of the fact that some researchers have observed that breast milk may have some anti-infective properties when applied topically to the eyes (Ernest & Adeniyi 2001), one could be silent on this until more facts are available. However, inappropriate or delayed treatment of jaundice could lead to brain damage and subsequent mortality (Shapiro 2003).

The placing of LBW infants close to the mothers while they sleep is similar to the Kangaroo method, and this may be of advantage. However, some health workers have expressed fear of the mother mistakenly sleeping over and suffocating the LBW infant.

The patronage of other caregivers outside the home is very common in the rural areas studied, possibly because of their proximity and accessibility. The training of these care providers in the provision of appropriate care for the newborn, particularly the LBW, would be an essential aspect of any interventions aimed at improving neonatal outcome. From the foregoing, there is a need for urgent attention to be paid to the plight of the LBW infants in the rural areas of Nigeria as a whole, in order to enhance their survival and to facilitate the attainment of the Millennium Development Goals.

A limitation of this study is the small number of the participants who were purposively selected, and therefore, the sample may not be representative of south-western Nigeria. However, the use of non-threatening semi-structured interviews, which allowed respondents to better express themselves, and the triangulation of information at the level of data sources and analysis all combine to enhance the validity of the study data. The study has also revealed the need for health education targeted at rural and orthodox healthcare providers.

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