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Mothers' Experiences with Neonatal Care for Low Birth Weight Infants at Home; A Qualitative Study in the Hohoe Municipality, Ghana

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ABSTRACT

Purpose: To explore knowledge and beliefs of mothers on low birth weight (LBW), examine care provision at home and societal perceptions of LBW infants.
Design and methods: This qualitative study was conducted using hermeneutic phenomenological approach. Data of mothers who delivered LBW infants within 2 years preceding the study were purposively extracted from the medical records of the Hohoe Municipality Hospital in Ghana. Twenty semi-structured interviews and three focus group discussions were conducted. A thematic analysis approach was performed using Atlas.ti.
Results: Mothers identified and described LBW babies based on frailty, size and activity levels. LBW recognition was easier for multiparous mothers by comparing with previous deliveries. LBW was linked to poor maternal diet, diseases during pregnancy and heavy workload. Although most mothers perceived their LBW babies as healthy irrespective of the size a few home-care practises differed. Smaller LBW infants were less likely to be socially accepted. In the first few weeks after birth the care of LBW infants is the core responsibility of grandmothers. Primiparous mothers and those whose infants were smaller (<2 kg) quested for more information and support on LBW newborn care at home.
Conclusion: There is a need to increase knowledge on risk factors and tackle lapses in the recognition and care of LBW infants. Counselling on recommended neonatal care should begin during antenatal care and reiterated during postnatal care.
Practical implication: Tailored in-depth and culturally-adapted counselling, discharge instructions and home-based postnatal visits targeted at LBW infants and their primary caregivers could improve care.

Introduction

Low birth weight (LBW), whether due to preterm delivery or small for gestational age or both, accounts for 80% (Lawn et al., 2014) of the 19 deaths per 1000 live births neonatal mortality rate (NMR) globally (UNICEF, 2017b). LBW remains a significant public health problem in South Asia and Sub-Saharan Africa (WHO, 2018b). In Ghana, neonatal disease burden is high with a NMR of 27 per 1000 live births (UNICEF, 2017a). LBW constitutes 11% of all deliveries nationwide (UNICEF, 2017a) and 9.7% in the study location (Agbozo, Jahn, & Abubakari, 2016). Although a high burden, it is less than the estimated 15–20% LBW deliveries recorded worldwide (WHO, 2018b).

Birth weight (BW) has direct impact on child development and survival, causing health and socio-economic burden for individuals, families, health systems and national budgets (Lawn et al., 2014; Liu et al., 2015). Daily, 3000 neonates die from LBW complications including respiratory problems, infections and undernutrition (Liu et al., 2015). Frequent morbidity entails extra health care, physical and financial stress on families and other opportunity costs. In childhood, risk of growth failure, stunting, disability and post-neonatal death increases (Lawn et al., 2014) and complicates existing congenital conditions (Best, Tennant, & Rankin, 2017). Long-term disability from cognitive and neurodevelopmental impairments and adult-onset of non-communicable diseases is likely (Calkins & Devaskar, 2011; Lawn et al., 2014).

Ghana has renewed its commitment to reduce neonatal death by focusing on care of small and sick newborns as endorsed in the Sustainable Development Goals (SDGs) which targets NMR ≤ 12/1000 live births by 2030. One measure towards this is the National Newborn Health Strategy and Action Plan (2014–2018) adopted from the global Every Newborn Action. The 5-year policy framework targets a reduction of NMR from 32 to 21/1000 live births from 2011 to 2018 (Ghana,

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2014). These investments aim to reduce the estimated 1 million neonatal deaths that occur on the day of birth, another 1 million within the first week and 2.5 million newborns that occur in the first month of life (WHO, 2018a).

Considering that institutional delivery in Ghana is 73.1%, only 60.3% of newborns are weighed at birth and 22.8% of newborns receive facility-based postnatal care within 2 days after birth (UNICEF, 2018), recognising and supporting LBW infants is challenging. Poor access to health care and infrequent post-discharge contact with the health worker necessitate that caregivers are equipped with knowledge on evidence-based life-saving neonatal care practices at home.

Exploratory studies in India (Darmstadt et al., 2008) and Uganda (Nabiwemba, Atuyambe, Criel, Kolsteren, & Orach, 2014) have revealed poor knowledge with the recognition of LBW, their physiologic needs associated with LBW and appropriate home care. Non-recognition of LBW delay care-seeking and lead to inappropriate caregiving (Marsh et al., 2002) such as immediate cord clamping, first bath within 6 h post-delivery, pre-lacteal feeding and suboptimal thermal, cord, and eye care (Nabiwemba et al., 2014). These problematic practices increase risk of sepsis, hypothermia, hypoglycaemia and anaemia (Marsh et al., 2002).

Evidence-based low-cost care practices and interventions such as Kangaroo mother care (KMC), cord/skin care, early breastfeeding initiation and prompt treatment of complications can significantly improve survival of LBW babies globally (Conde-Agudelo & Díaz-Rossello, 2016; Lassi, Middleton, Crowther, & Bhutta, 2015). These essential newborn-care practices are implementable both in health facilities and at home (Black et al., 2017; Callaghan-Koru et al., 2013). However, literature is limited on home care of LBW infants and effect of care provision on child survival in Ghana. Therefore, in this study, we critically explored mothers' understanding, knowledge and beliefs about LBW and examined home care practices in the neonatal period. Also, we probed into societal perceptions on LBW and mothers' judgements of the factors that contributed to survival of their infants.

Methods

Study site

The study was conducted in the Hohoe Municipality, one of the fastest growing administrative districts centrally located in the Volta Region, Ghana. The Hohoe Municipal Hospital where the study participants were identified, is a 178-bed capacity secondary-level referral facility serving over 200,000 inhabitants. The facility provides emergency obstetric and newborn care as well as care for sick and small newborns. The services offered include neonatal resuscitation, Kangaroo mother care, oxygen therapy, phototherapy, nasogastric tube feeding and treatment of neonatal infections whereas complicated cases are referred to tertiary facilities. The hospital conducts over 2000 deliveries yearly of which 9.7% are LBW cases (Agbozo et al., 2016) thereby making it an ideal entry point to identify potential study participants.

Design

The design used was built on the hermeneutic phenomenology theoretical perspective, where lived experiences of individuals are described and interpreted (Creswell, 2007). This approach, widely applied in health care fields, is robust at describing experiences of individuals of a common concept and the meanings attached (Creswell, 2007). In this study, the phenomenon studied was LBW. The focus was to develop a composite rich description of the experiential meanings held by mothers who experienced caring for LBW infants. In the hermeneutic phenomenological method, the researcher mediates and manages what is researched (Finlay, 2012). Based on Giorgi's (1997) phenomenological framework, three interrelated steps of reduction, description and essence searching were employed. These steps are applied throughout this study.

Sampling procedure

Participants who experienced the phenomenon were purposively recruited to address the research questions. The sampling frame was mothers who delivered LBW infants in the Hohoe Municipal Hospital. The investigators reviewed delivery records at the labour ward with the support of a data entry clerk. Retrospective identification of eligible participants was restricted to mothers who delivered singleton LBW infants (BW < 2.5 kg) between March 2015 to mid-December 2016. This minimized recall biases. LBW newborns with congenital abnormalities, HIV-infected/affected, twin/multiple births or motherless babies were excluded. Birth weight, date of delivery, name and contact details of mothers were extracted from the delivery register for 264 eligible participants identified. Summary of participant recruitment process is presented in Fig. 1. The authors contacted the identified mothers who recorded the most recent deliveries via phone call and consecutively interviewed until thematic saturation was reached. Data collection ended when no new themes were obtained from the interviews despite new recruitments. Out of 68 eligible participants, 38 participated in the study; 18 in focus group discussions (FGDs) and 20 in semi-structured in-depth interviews (SSI). Each of the 3 focus groups had 6 participants.

Data collection

Prior to the in-depth interviews, socio-demographic information on the maternal-child pairs was obtained. Gestational age at birth and BW of the child were extracted from the medical records and their nutritional status assessed. Parallel qualitative data sources included SSI and FGDs. The FGDs complemented the interviews by further unravelling the phenomenon, building on ideas and expanding on findings from the interviews. This ensured comprehensiveness and encouraged a more reflexive analysis. By triangulation, patterns of convergence were verified thus enhancing validity of the overall interpretation (Malterud, 2001). A similar topic guide, written in English and translated into the local language (Ewe) was used for the SSI and FGDs. It contained unstructured open-ended questions and a few structured socio-demographic questions. Generally, the questions covered experiences in terms of the phenomenon (textural) and the context that typically influenced these experiences (structural) (Creswell, 2007). The main topics included mothers' understanding and knowledge concerning LBW infants, caring practices at home, community perception and availability of health and social support. Interview sessions started with questions that established rapport and created a conducive environment before discussing the substantial matter. Probes such as “can you tell me more” and “can you describe this” were used. The instrument was pre-tested using one mother from an adjourning district who had experienced the phenomenon. Aside reordering a few questions, no major changes were necessary. The FGDs were held at the premises of the Hohoe Municipal Hospital but participants decided on their preferred venue for the interviews, which was mainly in their homes. The SSI and FGDs were conducted by the second author and the data analysed concurrently. Communication was in Ewe except for two interviews where English was feasible. To minimize selection bias, participants were randomly assigned to partake in one of the two data collection procedures through a simple balloting. All sessions were moderated by the investigators. The SSI and FGDs lasted for about 45 and 80 min respectively during which audio-recording was done alongside taking field notes. After 20 SSI and 3 FGDs, thematic saturation was reached. The study was conducted from October 2016 to January 2017.

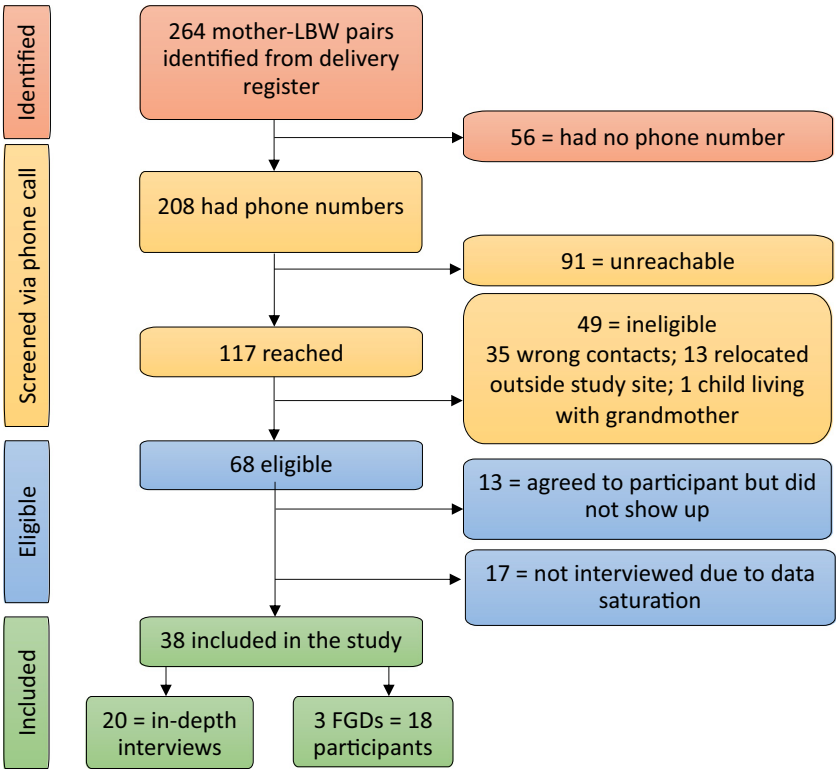

Fig. 1. Summary of participant identification and recruitment.

Ethics

This study protocol was approved by the Ghana Health Service Ethical Review Committee (ID no. 18/07/16). Permission was granted by the hospital management to review the medical records. Consenting process was in two stages, verbal and written. The telephone conversations included brief information on the study protocol and verbal affirmation of willingness to participate. Before the interviews, written informed consent was obtained from the participants. In case of participants who could not read, the information sheet was read aloud to them in the presence of a witness, usually a relative after which they thumb-printed the consent sheet. Although the researchers could not guarantee individual confidentially for participants in the FGDs, ground rules on confidentiality and respect of privacy especially not disclosing what was discussed outside the focus group was emphasized to all group members. All identifying participant information was removed prior to analysis and the data was anonymized.

Data analysis

Content of SSI and FGDs were transcribed verbatim into English by the first and second author and the language validated by the third author. The transcriptions were exported into Atlas.ti software (version 7.5.16) and analysed thematically by the investigators independent of each other. Creswell's (2007) theoretical lens of analysing phenomenological data was adapted. Building on the research questions, the data were crucially reviewed to identify patterns that addressed the central theme of the study, provided new insights on the phenomenon and aided interpretation of the text (Creswell, 2007). Initial codes were developed deductively after which in-vivo codes were induced from the data in response to new ideas that evolved. Codes and themes obtained from the parallel analysis were compared. Divergent views on meanings assigned to the codes were discussed collectively until consensus was reached on appropriate themes that adequately captured participants' experiences. Overall, 133 codes were assigned to salient portions of the textual data supported by significant verbatim quotes. Related codes were grouped together into nine sub-themes from which three themes emerged. Last was the description (textural and structural) and interpretation (essence) phase where findings were described in relation to what participants experienced, the social setting that influenced how the phenomenon was experienced as well as the meaning of the common experiences.

Rigour

Credibility was ensured by random selection and random assignment of mothers to the SSI and FGDs; instrument piloting; varied data sources; and iterative questioning using probes. By vividly describing the phenomenon and buttressing experiences using verbatim quotes, transferability was addressed. Bias reduction through triangulation, concurrent interview and analysis and audit trail using voice records, transcripts, codes and field notes addressed issues relating to dependability and confirmability.

Results

The data analysis revealed nine sub-themes describing the mother's experiences in caring for their LBW infants. These nine sub-themes gave rise to three themes which are: knowledge and beliefs about LBW, caring practices for LBW infants and availability of support.

Demographic characteristics

Mothers' age ranged from 17 to 40 years (mean: 26.8 ± 7.9). Over half (55.3%) were primiparous. Mean BW was 0.9–2.4 kg (2.09 ± 0.35). At the time of the study, all infants were alive, and their mean age was 8.6 ± 7.0 months. Gestational age at delivery was 35–43 weeks (37.45 ± 2.27). Table 1 shows background characteristics of participants.

Table 1
Socio-demographic characteristics of mother-child pairs.

Maternal			Child		
Variable	Groups	n (%)	Variable	Groups	n (%)
Education	Primary	4 (10.5)	Sex	Male	15 (40.5)
	JHS	23 (60.5)		Female	22 (59.5)
	SHS	10 (26.3)	Age (months)	<6	20 (51.4)
	Tertiary	1 (2.6)		6–12	6 (16.2)
Employment	Unemployed	10 (26.3)		>12	12 (32.4)
	Employed	28 (73.6)	Birth order	1st child	22 (57.8)
Marital status	Single	12 (31.6)		2nd child	8 (21.1)
	Married	26 (68.4)		≥3	8 (21.1)
Place of residence	Urban	18 (47.4)	Gest. age at birth	Pre-term	11 (28.9)
	Rural	20 (52.6)		Term	19 (50.0)
Body mass index	Underweight	4 (10.5)		Post-term	3 (7.9)
	Normal	30 (78.9)		No data	5 (13.2)
	Overweight	1 (2.6)	Birth weight (kg)	<2.0	10 (26.3)
	Obese	3 (7.9)		2.0–2.4	28 (73.4)
Blood pressure	Optimum	20 (52.6)	Wasting	<−2 SD	10 (29.4)
	Normal	9 (23.7)	Stunting	<−2 SD	13 (37.1)
	High	9 (23.7)	Underweight	<−2 SD	17 (47.2)

n, sample size; SD, standard deviation.

Knowledge and beliefs about LBW

Mothers' understanding and identification of LBW babies

Most mothers understood the term 'low birth weight' or "small baby" as a newborn whose size at birth is smaller than normal and who is helpless at the time of birth thus needing care.

"*Is any baby that is not big at the time of birth*."
[[primipara, BW 2.1 kg, FGD 1]]

"*It means someone who is not able to do anything for himself*."
[[primipara, BW 2.4 kg, SSI 3]]

Generally, multiparous mothers were able to recognise that the newborn was LBW by comparing to previous deliveries. In the case of primiparous mothers, LBW recognition was more difficult and only possible when compared to other deliveries. However, we observed that the smaller the newborn, the higher the tendency of recognition.

"*I saw that the baby was small …… Because I gave birth to the first one and she wasn't that small*."
[[multipara, BW 1.7 kg, SSI 3]]

"*I have never given birth before, but I noticed that my baby was small after we were moved to the lying-in ward. When I saw other mothers' babies, I noticed theirs were far bigger than mine. There I noticed my baby was small*."
[[primipara, BW 2.4 kg, FGD 1]]

Majority of the mothers were unaware of an ideal BW. A few confirmed having been informed by the health staff of LBW, but the majority had no prior knowledge. Health staff often informed those mothers whose babies weighed <2.0 kg and did not always inform mothers with newborns weighing between 2 and 2.4 kg.

Two mothers were reportedly informed during antenatal visits that their expectant baby was LBW.

"*I was not told at the time I gave birth to the baby but when I attended antenatal clinic, I was told the baby inside me is not big. So truly, the baby wasn't big when I gave birth*."
[[primipara, BW 2.2 kg, FGD 2]]

"*No. I wasn't informed, but I was able to notice it myself. The moment I saw the size, I knew the baby was too small*."
[[multipara, BW 2.4 kg, SSI 5]]

Some mothers associated the physical activity level of the newborn to being healthy. Even in situations where mothers recognised their newborns to be small, they were not considered to be at higher risk for adverse health outcomes compared to normal weight babies.

"*What encouraged me was that even though I saw that my baby was very small, she was able to move parts of her body. She cried and was able to breastfeed. So, I realised the baby was small but not ill*."
[[multipara, BW 2.4 kg, SSI 5]]

"*She is not so big, but she is very strong and active*."
[[primipara, BW 2.2 kg, FGD 2]]

"*… the reason why I said it's normal is because she was not sick or anything. Just like a normal weight baby*."
[[primipara, BW 1.7 kg, SSI 19]]

However, a few mothers whose newborn weighed below 2 kg harboured fears about the size.

"*Since I noticed that the baby was small, I was a little bit scared for the first two weeks. … But as the baby was getting out of it by gaining weight, I was no longer afraid*."
[[multipara, BW 1.6 kg, SSI 1]]

Beliefs regarding causes and prevention of LBW infants' deliveries

Mothers linked LBW delivery to gestational experiences, such as poor dietary intake, frequent nausea and vomiting, existing medical conditions, heredity and heavy work load.

"*I wasn't feeling well during the entire period I was pregnant. They (health staff) said I didn't have enough blood, so they gave me extra blood*."
[[multipara, BW 1.7 kg, SSI 9]]

"*When I was pregnant, I did a lot of work that put me through stress. I used to go to farm a lot, doing heavy tasks. I uproot cassava and other stuffs continuously till I gave birth*."
[[multipara, baby's BW 2.4 kg, SSI 5]]

"*There is a certain lady in my house, whose baby is older than mine, but her baby looks so small. The baby's father is also smallish. So, we took it*

that since the father is small, that is why the baby was also small."
[[primipara, BW 2.3 kg, FGD 1]]

Few participants demonstrated having fair knowledge on measures to reduce LBW risk such as uptake of family planning services and improved dietary intakes. However, the majority had no idea.

"*Family planning enables us to space our children very well. It prevents the baby from being small*."
[[primipara, BW 2.0 kg, SSI 16]]

"*My mother keeps telling me that if I don't eat well, it is likely I will give birth to a baby that would be small. But I don't have appetite for food. This causes me not to eat food at all. … So, I think if you feed well, the baby would gain weight as well*."
[[multipara, BW 1.6 kg, SSI 1]]

Mothers' perception on reasons for survival of their LBW infants

Basically, the mothers attributed survival of their LBW infants to God and their personal efforts such as hygiene practices, feeding on-demand, providing adequate warmth, and seeking prompt medical care when the need arises.

"*I would say it's the grace of God*."
[[primipara, BW 2.2 kg, SSI 6]]

"*The instructions they gave me concerning holding the baby very close to my breast as well as always wrapping the baby in cloth helped*."
[[multipara, BW 1.7 kg, SSI 9]]

Caring practices for LBW infants

Most mothers perceived their LBW babies as healthy irrespective of the size. Although few variations were noted, we deduced from experiences shared by multiparous mothers that majority of the care practices for LBW infants were similar to the care practices given to their previous normal weight babies. In case of primiparous mothers, care practices were normally based on personal inclinations and observations in the community of what constituted adequate newborn care.

"*I cater for the baby just like any normal Ghanaian woman would do. Bath twice daily. …… any time she wants the breast, I give her*."
[[multipara, BW 2.4 kg, SSI 13]]

Feeding

Most mothers practised exclusive breastfeeding but some encountered difficulties.

"*She (baby) was unable to handle the breast, so I squeeze it before giving to her. Before she started to hold it*."
[[primipara, BW 2.2 kg, FGD 2]]

Verbal education on breastfeeding was an integral part of antenatal care and post-delivery discharge instructions provided by midwives/nurses. However, mothers who had little experience with child care expressed the desire to get more practical demonstration on breastfeeding.

"*I wish to know just how to take care of the baby, how to breastfeed… Yes, to hear it and then the practise. To practise it… I like to see them doing it*."
[[primipara, BW 2.0 kg, SSI 8]]

Mothers who practiced mixed feeding complemented the breastfeeding with formula milk and semi-solid foods such as porridge (made from corn/millet/beans blend) with the hope that the LBW infant will grow to a similar size as their normal-weight counterparts. However, a few complained of not producing enough breastmilk because of their small breast size, some felt breastmilk alone was not sufficient for the baby or feared that the child was thirsty and needed water.

"*I bought lactogen [formula milk], which I gave her in addition to the breastmilk because she (baby) was small and I thought that would be the best for her to grow faster*."
[[primipara, BW 1.8 kg, SSI 19]]

"*I don't feel comfortable doing that* (exclusive breastfeeding). *So, the moment the baby was four months, I introduced water……I feel she is always thirsty*."
[[multipara, BW 1.7 kg, SSI 9]]

"*He doesn't sleep in the night. … Because the breastmilk is not enough for him. So, from two months on I started giving him koko (corn porridge)*."
[[primipara, BW 2.4 kg, SSI 11]]

Bathing and skin care

Midwives provided the first bath for babies often within few hours after birth in the absence of the mothers.

"*I gave birth at dawn and I think the bath was done in the morning. I gave birth around four and the bath was done around seven, eight in the morning*."
[[multipara, BW 2.4 kg, SSI 13]]

Traditionally in Ghana, female adults, particularly maternal and paternal grandmothers, bath newborns in the first few weeks after delivery (usually up to 6 weeks). Bathing is done one to three times daily. Regarding positioning, the one providing the bath sits on a low stool, crosses the legs over a bath basin and places the baby on the thighs. The bathing process is rigorous, sometimes lasting up to an hour.

"*Every morning, she [mother in-law] uses hot water around the abdomen and on the head. She starts from the head before she comes to the front and finally to the back. In the evening too the same. But sometimes in the afternoon also. As we don't use fan because of the baby's health, we bath them in the afternoon when the weather is hot*."
[[multipara, BW 1.7 kg, SSI 9]]

Preference for particular brands of bathing and skincare products depended on the age or stage of development of the infant. Apart from soap, antiseptics were used with the notion of avoiding bad smell thought to be associated with breastmilk or to protect the infant from microbes.

"*I use dettol (antiseptic) because of the way the breastmilk stinks*."
[[multipara, BW 1.8 kg, SSI 12]]

"*The child is so small, and the immune system is not that strong, so you feel the water even though it's pipe water may have some germs in it. ……That's why I add the savlon (antiseptic) to it*."
[[multipara, BW 2.4 kg, SSI 13]]

Sometimes, food items such as tomato juice, egg plants and 'gari' (grated and roasted cassava) were added to the baby's bathing water. These food items were believed to cure neonatal skin rashes.

"W*hen my baby was two weeks old and had rashes, my in-law added gari to the bath water. After few bathes, all the rashes vanished*."

[[multipara, BW 2.4 kg, FGD 1]]

To promote weight gain and growth, spices and fresh herbs were added to the baby's bathing water and often, the practice described below is done:

"*After bathing the baby and we are about to wipe the skin with towel, we use the water that splashes on the (adult's) thighs to touch the baby's back three to four times …… so that the baby will grow bigger*."
[[multipara, BW 2.2 kg, FGD 2]]

"*Also, the time I gave birth to mine, my mum bought 'asken' and 'pepre' (spices) which she grinded very smoothly under the stone. After bathing, I apply it to myself while it is applied to the baby as well*."
[[multipara, BW 1.5 kg, FGD 3]]

During the bath, the babies are massaged intensely using hot water and the extremities are flexed and extended several times on the premise of increasing strength and flexibility of the bones.

"*When my mother baths the baby, she presses the head with the towel. […] She then holds the arms and pull them backward and forward and press them very well. She does similar things to his legs. She turns the baby to lie on his back and press it as well*."
[[multipara, BW 2.2 kg, FGD 2]]

Circumcision and cord care

All mothers alluded to using methylated spirit to clean the umbilical cord stump. A few however preceded this by cleaning with a damp towel and soap or added shea butter after the dry cleaning with methylated spirit.

"*I use the spirit together with shea butter. So, the place becomes soft always and so that the place doesn't get rotten*."
[[multipara, BW 2.4 kg, SSI 11]]

Usually, circumcision is done between one to two weeks after birth. In the case of LBW infants, this can be delayed to more than one month after delivery to allow the infant to gain weight and energy to withstand the process.

"*They (father in law) said the penis hasn't developed yet. So, they should allow it (penis) to develop a little bit. As the baby wasn't also so big the penis was not out yet*."
[[primipara, BW 1.8 kg, FGD 2]]

"*When he was circumcised, she (community health worker) gave us an oil […….] she placed a medicine in the oil and tied it around the wound. She cautioned that we leave the wound tied for three days after which we should wash frequently*."
[[primipara, BW 2.0 kg, SSI 16]]

Healing of the circumcised penis was facilitated by sitting the baby in warm water in which fresh herbs is sometimes added.

"*After bathing, the baby was placed into the hot water after which the pampers was put on again*."
[[primipara, BW 2.4 kg, FGD 1]]

Thermal care

Mothers were conscious not to unnecessarily expose their newborn to adverse weather conditions. Babies were dressed in protective clothing and wrapped in blankets. Although wearing socks on baby's feet appeared to be part of normal dressing to conserve heat, the mothers added that it warded off 'evil eyes' from seeing the baby's sole.

"*When people with evil powers look through the feet of babies, the babies are likely to die. Hence, we always wear socks on babies' feet*."
[[multipara, BW 2.4 kg, FGD 3]]

Body temperature of the newborn was determined based on mother's temperature. Maternal sensation of cold implied that the baby was also feeling cold.

"*…babies mostly are unable to say it if they are feeling cold. So, what I do is anytime I feel cold then I know the baby also will be feeling cold. Or anytime there is cold outside, I always cover the baby completely to avoid air reaching the baby*."
[[multipara, BW 1.6 kg, SSI 1]]

KMC was scarcely practised at home with the argument that healthcare staff did not provide adequate information on the practice. One mother who affirmed been taught KMC did not practice it due to unfamiliarity with the practice coupled with cultural barriers.

"*.....Yes, I was taught. I always carry my baby on my back. I'm not able to carry him in front…….I'm not use to it*."
[[primipara, baby's BW 1.6 kg, SSI 10]]

Availability of support

Family and societal attitudes towards LBW infants

Reaction of family members on the birth of LBW newborns was similar as for normal weight newborns. In instances when the newborn weighed below 2 kg, acceptance and handling differed. Family members avoided carrying such babies on the premise of fragility, fear of harming baby and their vulnerability to diseases.

"*People didn't accept my baby. They claim the baby is too small and the skin is soft*."
[[primipara, BW 2.0 kg, SSI 4]]

"*People said all sort of things about my baby. But some also encouraged me that such babies become intelligent in future*."
[[primipara, BW 1.5 kg, FGD 1]]

Some fathers were displeased having LBW babies and felt uncomfortable handling them leading to a feeling of neglect of parental role by the women.

"*My husband wasn't so happy because the baby was small. He said he can't even pick the baby*."
[[primipara, BW 2.0 kg, SSI 4]]

Sometimes, provocative nicknames were given to the LBW babies.

"*He (husband) gave the baby some nicknames because the baby was small. It became a quarrel between us. I argued that he shouldn't give the baby any nickname. We should call him just by the name we gave him*."
[[multipara, BW 2.4 kg, FGD 1]]

Access to information on care of LBW infants

Participants, particularly those whose infants weighed below 2 kg at birth, quested for more information and support on LBW newborn care at home. Majority of these mothers claimed not to be explicitly informed about the specific caring needs for LBW infants. Apparently, discharge education and instructions given at the postpartum ward was insufficient or not tailored to the care of LBW infants.

"*Well, I wasn't advised specifically because my baby was small. The general advice they give to mothers who deliver at the hospital was the one given to me*."

[[multipara, BW 1.6 kg, SSI 1]]

Participants iterated the desire for a support centre and/or contact with community health workers to whom they could be referred to upon discharged from the hospital. Child Welfare Clinic (CWC) was the only source where basic advice on childcare was given but this too was generalized and often suited for normal weight babies.

"*There is no place as such apart from the weighing centre (CWC). Over there, they give us normal talk… but there is no place we are called to for (special) education.*"

[[primipara, BW 1.8 kg, SSI 12]]

In a single instance, a mother was assigned to a community health nurse for support.

"*[…] but she never came to my house. They gave me a letter from the hospital to give to the nurse for her to be visiting us to see how the baby was doing but she never turned up despite me calling her.*"

[[primipara, BW 1.5 kg, FGD 1]]

Discussion

The study sought to gain an in-depth understanding of mothers' knowledge, beliefs, and practices on LBW deliveries. LBW substantially accounts for the high NMR (Lawn, Cousens, & Zupan, 2005) and is a major public health concern and economic burden especially in low-income countries (Blencowe et al., 2013). LBW delivery is higher among primiparous and teenage mothers and accounts for 32% of all stillbirths in the study area (Agbozo et al., 2016). With LBW constituting 29% of all neonatal deaths, there are renewed political commitments to focus on care of small newborns to reduce neonatal death to 21/1000 live births by 2018 and ultimately achieve the SDG target of ≤12/1000 live births by 2030 (Ghana, 2014). In Ghana, average length of hospital stay for newborns is short and coverage for postnatal services is low. Hence, home-based care for LBW infants is critical and requires consideration of socio-cultural beliefs and practices that influence their care (Adejuyigbe, Odebiyi, Aina, & Bamiwuye, 2008). Findings revealed that unlike primiparous mothers, LBW infants are much easily recognised by multiparous mothers and are not perceived as vulnerable. LBW was linked to poor diet, ailments and heavy work load. Grandmothers were the primary caregivers in the first weeks after delivery. Deep-rooted cultural beliefs influenced maternal care practices.

Despite the crucial role of recognition in the care of the LBW infants (Marsh et al., 2002), mothers do not necessarily associate BW with health and wellbeing (Darmstadt et al., 2008) especially when the newborn appears strong and active (Nabiwemba et al., 2014). Equating physical activity of LBW infants to optimal health without considering the BW and the presuming that they do not need special care can compromise care provision and escalate neonatal morbidity and mortality. For caregivers to understand BW and its implications on child care, development and survival (Nabiwemba et al., 2014), health workers need to find culturally-relevant channels of explaining BW to mothers (Darmstadt et al., 2008).

Although mothers demonstrated some level of awareness on exclusive breastfeeding (EBF), complementary foods were introduced earlier, on the assumption of babies not being satisfied with the breastmilk. This concurs with similar studies where mothers reportedly thought breastmilk was necessary but insufficient for their babies and that their crying signified the desire for additional food (Adejuyigbe et al., 2008; Diji et al., 2016; Kerr, Dakishoni, Shumba, Msachi, & Chirwa, 2008).

Contrary to beliefs that frequent bathing of LBW babies using soap and antiseptic is ideal for skin care and prevents odours and infections, the epidermal barrier lipids on the skin can be removed resulting in dryness, irritation, slower sebaceous gland output and increase bacterial counts on the skin (Darmstadt et al., 2007). Rigorous bathing seen as essential for bone strengthening, is a culturally-rooted practice in other African countries as well (Adejuyigbe et al., 2015). It is believed to help babies to sleep better and shape the head (Hill, Tawiah-Agyemang, Manu, Okyere, & Kirkwood, 2010). But the long bathing is stressful, causes energy loss, hypothermia and increases risk of infections (Lunze & Hamer, 2012). To prevent hypothermia in LBW infants, it is important to educate caregivers to postpone bathing, reduce the frequency and intensity until physiologically stable (Colwell, 2015).

We found that most of our study participants used methylated spirit for umbilical cord care however, WHO (2013) recommends the use of 7.1% chlorhexidine in homes and settings where NMR is ≥30 per 1000 live births. Randomized control trials conducted in parts of Nepal, Bangladesh, and Pakistan found that, the use of 7.1% chlorhexidine leads to a reduction in omphalitis ranging from 27 to 56% depending on severity of infection as well as a 23% reduction in neonatal mortalities. Other studies conducted in resource-limited countries have found the desire to apply other unhealthy products such as salt and powder to the stump to promote faster healing (Coffey & Brown, 2017). Apart from methylated spirit a few participants applied soap or creams such as shea butter to soften the cord stump. Unclean cord care practices increase susceptibility to infections which often leads to death if not recognised early (Penfold, Willey, & Schellenberg, 2013). Mothers were likely to apply unprescribed products to the umbilical cord stump. Hence, it might be more appropriate to introduce 7.1% chlorhexidine instead of promoting dry cord care. Since NMR in the study location is 27/1000 live births (UNICEF, 2017a), stakeholder consultations to change from methylated spirit to 7.1% chlorhexidine is timely since alcohol solutions can cause foul-smelling stumps and prolong the healing process (Darmstadt et al., 2007).

Similar to other studies, babies are perceived as vulnerable to cold air and measures such as covering in protective clothing minimizes cooling out (Adejuyigbe et al., 2015; Hill et al., 2010; Winch et al., 2005). But the countereffect of early bathing (Hill et al., 2010) and long exposure to air through extensive bathing could cause hypothermia. KMC, an intervention which helps in thermoregulation, lowers risk of infection and enhances growth (Bergh et al., 2013; Penfold et al., 2013) was seldom practised due to lack of instruction on its performance at home. Elsewhere, there are complaints of tiredness, chest and backache (Adejuyigbe et al., 2015). Although KMC is easily understood by mothers (Hill et al., 2010), to facilitate its uptake, the Newhints trial in Ghana suggests improved counselling and early introduction of KMC to antepartum and postpartum mothers (Vesel et al., 2013).

The findings of this study indicated that in the first few weeks, care of LBW infants is the core responsibility of 'experienced' female relatives. There is need to incorporate these significant others in the counselling process since mothers often have little influence over newborn care particularly due to the "experienced" caretakers' unwillingness to accept new practices (Iganus et al., 2015). Divergent views on newborn care could generate conflicts and consequently compromise care provision.

Evidence-based low-cost neonatal care interventions like KMC, cord care, early breastfeeding initiation and delayed bathing significantly improve survival of LBW babies (Bhutta et al., 2014; Conde-Agudelo & Díaz-Rossello, 2016; Lassi et al., 2015). Participants considered health staff's advice on these interventions incomprehensive and expressed desire for detailed education. Tailored messages delivered through appropriate channels of communication are essential because as observed, counselling on breastfeeding using demonstration was desired. Fulfilling this quest could lead to the desired behaviour change. For example, lactational counselling of mothers during the prenatal and perinatal period considerably increased early initiation of BF and EBF in Ghana (Aidam, Perez-Escamilla, & Lartey, 2005). Awareness should intensify on the vulnerability of LBW babies to infections with emphasis on care and hygiene practices, involvement of other primary caregivers

particularly grandmothers and adhering to facility- and home-based postnatal visit schedules.

This study adds to the limited data in Ghana on home-based care for LBW infants as well as the sociocultural practices that needs to be modified or strengthened in the newborn continuum of care.

Limitation

Our sample included a few very LBW infants. Over half of potential participants were excluded due to lack of mobile phone numbers and poor network typical in remote areas. Many of the mothers we could not reach had very LBW infants. This partly explains why no death was recorded among the participants' infants, since higher mortality is linked to lower the BW (Lawn et al., 2014). It was difficult to maintain an absolute "distance" between the participants and the researchers as the researchers are health professionals with clinical experience in neonatal care. Hence the adaption of both deductive and inductive coding. Some subtle emotions might have been lost in the translation. Data were based on reported practices rather than observation. Self-reports are prone to recall and response bias. The Hawthorne effect where participants possibly adjusted their responses to our expectations was minimized through careful probing and triangulation of data sources (Holden, 2001).

Conclusions

To make progress in reducing neonatal morbidities and mortalities due to LBW and to achieve the SDG target, there is an urgent need to increase knowledge on risk factors and tackle lapses in the recognition and care. Since newborn care practices are influenced by deep-rooted socio-cultural elements, counselling on recommended neonatal care should begin during antenatal care and reiterated during postnatal care. Other primary caregivers such as grandmothers have to be included into the education as well.

This study can help to enhance knowledge and understanding on the experiences and perceptions of mothers caring for LBW infants in similar settings in Ghana and elsewhere in Sub-Saharan Africa. It displays the need for improving counselling and health education on newborn care especially for LBW infants in facilities and in home settings.

Future studies could explore strategies to improve counselling provided by clinical nurses for families with LBW infants. Investigation on home care practices for very LBW infants and mothers' perceptions on causes and prevention of neonatal death might enhance understanding of the phenomenon.

Practice implications

This qualitative study has provided a deeper understanding of mother's experiences and caring practices for LBW infants in resource-poor settings. It emphasizes to both clinical and community-based nurses to enhance knowledge of mothers and to support them. Mothers who deliver LBW babies should be explicitly informed by the health professionals on the birth weight and implication of care on morbidity and survival. Mothers should be counselled by nurses and midwifes during antenatal and perinatal care and given post-delivery discharge instructions using in-depth and culturally-adapted counselling on evidence-based newborn care. Special attention should be payed to high risk mothers such as primiparous and teenage mothers. Significant others who give care like grandmothers should be actively involved in the care process to enhance compliance and minimize conflicts. While emphasizing the importance of adhering to postnatal assessment schedules at the health facility, it is important to strengthen and supervise community health workers to visit mother-LBW child pairs at home, refer them to child welfare clinics and to mother support groups.

Competing interest

The authors have no conflict of interest to declare.

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CRediT authorship contribution statement

Christina Schuler: Conceptualization, Software, Validation, Formal analysis, Investigation, Resources, Data curation, Writing - Original Draft, Writing - Review & Editing, Visualization, Project administration, Funding acquisition. **George Edward Ntow:** Formal analysis, Investigation, Writing - original draft, Writing - Review & Editing. **Faith Agbozo:** Conceptualization, Methodology, Validation, Writing - Review & Editing, Supervision.

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Authors' contributions

Christina Schuler and Faith Agbozo designed the study and developed the data collection tools. Christina Schuler and George Edward Ntow collected, transcribed and analysed the data and wrote the initial draft. Faith Agbozo revised the manuscript for scientific content.

Ethical approval and consent to participate

Ethical approval was granted by the Ghana Health Service Ethical Review Committee (ID No: 18/07/16). Additionally, both written and verbal informed consent was obtained from the participants before collecting the data.

Consent to publish

Consent for publication was obtained from the participants both written and verbally. The consent forms of all participants are with the authors.

Availability of data and material

Data is available upon request from the main author.

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