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ORIGINAL ARTICLE

Infant Care Practices at Home in the First Weeks of Life in Ibadan, South-West Nigeria

Pratiques de Soins du Nourrisson à Domicile au Cours de la Première Semaine de Vie à Ibadan, dans le Sud-Ouest du Nigeria

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ABSTRACT

BACKGROUND: The World Health Organization recommends essential newborn care, which includes components that should be provided at home and in the community, to improve newborn outcomes. This study was carried out to assess infant care practices at home in the first week of life and how they conform to the provisions of essential newborn care.

METHODS: A total of 678 mothers who delivered their babies at Adeoyo Maternity Hospital, Ibadan were visited at home between the 8th and 10th days of delivery. Information on infant care practices with respect to hygiene, feeding, provision of warmth, eye care, cord care, immunization and health seeking behaviour was obtained.

RESULTS: Only 9.3% of the mothers washed their hands always before handling their babies, 83.3% did sometimes and 94.0% did so after diaper change. Breastfeeding was the first feed given by 93.8% of mothers, but only 21.6% of them started within one-hour of life. At the end of the first week, 71.2% were still breastfeeding exclusively. Only 16.6% of mothers bathed their newborns on the first day of life. To keep newborns warm, 82.0% shut their windows all day, and 9% lit kerosine-wick lanterns indoors. Mothers used alcohol (97.2%) and breastmilk drops (18.2%) for umbilical cord and eye care, respectively. Only 58.6% and 14.5% of babies had received any vaccination or had postnatal visit, respectively.

CONCLUSION: Infant care practices at home for newborns in Ibadan did not substantially conform to the provisions of essential newborn care and many practices were harmful. The need for supportive supervision in addition to health education for essential newborn care is indicated. **WAJM 2022; 39(12): 1245–1252.**

Keywords: Infant care; Home; Newborns; First week; Community.

RÉSUMÉ

CONTEXTE: L'Organisation mondiale de la santé recommande des soins essentiels pour les nouveau-nés, qui comprennent des éléments qui devraient être fournis à domicile et dans la communauté, afin d'améliorer les résultats des nouveau-nés. Cette étude a été menée pour évaluer les pratiques de soins aux nourrissons à domicile au cours de la première semaine de vie et leur conformité aux dispositions des soins essentiels aux nouveau-nés.

MÉTHODES: 678 mères ayant accouché à la maternité d'Adeoyo, Ibadan, ont été visitées à leur domicile entre le 8e et le 10e jour de l'accouchement. Des informations sur les pratiques de soins du nourrisson en matière d'hygiène, d'alimentation, d'apport de chaleur, de soins oculaires, de soins du cordon, de vaccination et de comportement de recherche de santé ont été obtenues.

RÉSULTATS: Seulement 9,3% des mères se lavaient toujours les mains avant de manipuler leur bébé, 83,3% le faisaient parfois et 94,0% le faisaient après le changement de couche. L'allaitement maternel était le premier aliment donné par 93,8% des mères, mais seulement 21,6% d'entre elles ont commencé dans l'heure qui suit la naissance. A la fin de la première semaine, 71,2% étaient encore en train d'allaiter exclusivement. Seuls 16,6 % des mères ont donné un bain à leur nouveau-né le premier jour de sa vie. Pour garder les nouveau-nés au chaud, 82,0% fermaient leurs fenêtres toute la journée et 9% allumaient des lanternes à mèche de kérosène à l'intérieur. Les mères utilisaient de l'alcool (97,2%) et des gouttes de lait maternel (18,2%) pour les soins du cordon ombilical et des yeux, respectivement. Seuls 58,6% et 14,5% des bébés avaient reçu une vaccination ou une visite postnatale, respectivement.

CONCLUSION: Les pratiques de soins à domicile pour les nouveau-nés à Ibadan n'étaient pas essentiellement conformes aux dispositions des soins essentiels pour les nouveau-nés et de nombreuses pratiques étaient néfastes. La nécessité d'une supervision de soutien en plus de l'éducation sanitaire pour les soins essentiels aux nouveau-nés est indiquée. **WAJM 2022; 39(12): 1245–1252.**

Mots clés: Soins aux nourrissons ; Domicile; Nouveau-nés; Première semaine; Communauté.

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Abbreviations: ANC, Antenatal Care; **BCG,** Bacille Calmette Guerin; **ECEB,** Essential Care for Every Baby; **ENCC,** Essential Newborn Care Course; **HBV,** Hepatitis B Vaccine; **HIV,** Human Immunodeficiency Virus; **LMIC,** Low- and Middle-income Countries; **NMR,** Neonatal Mortality Rate; **OPV,** Oral Polio Vaccine; **SEARCH,** Society for Education, Action Research in Community Health; **WHO,** World Health Organisation.

INTRODUCTION

Neonatal mortality rates (NMR) remain high in Nigeria and other developing countries. According to the 2018, National Demographic Health Survey (DHS), there was no noticeable reduction in NMR in Nigeria in five years despite the reduction in under 5 mortality rate from 157 deaths per 1,000 live births to 132 deaths per 1,000 live births between 2008 and 2013.[1] Nigeria has the highest number of newborn deaths in sub Saharan Africa reflecting the poor state of the healthcare system, especially maternal, newborn, child and reproductive health.[2] Newborn health is essential for future improvements in child health, human capital development and ultimately global development. Newborn health should therefore be a priority in Nigeria and other developing countries if a global reduction in child death is to be achieved.

The various child survival and safe motherhood strategies that had been implemented in the past decades failed to effectively address newborn mortality despite achieving some reduction in child mortality.[3,4] Evidence has shown that even in settings with high neonatal mortality and weak health systems, it is possible to achieve substantial reduction in newborn mortality through the implementation of low-cost family and community-based care, including health education to improve home-care practices, care seeking and demand for skilled care.[3] A review of some of the established low-cost interventions found that post-natal interventions are as effective as intrapartum interventions and 2 to 3 times more effective than antenatal interventions in reducing neonatal mortality, despite the fact that intrapartum interventions cost twice as much as post-natal interventions.[3] Experience in high income countries has shown that neonatal and perinatal mortality rates fell most dramatically long before neonatal intensive care units came into existence.[5] This implies that improvement in newborn care is achievable and affordable in resource-limited countries.

Low-cost and low-tech proven interventions can be carried out entirely within the framework of existing maternal and child health programs. Recent reviews indicate that essential care during pregnancy, childbirth, and the newborn period costs an estimated US$3 a year per capita in low-income countries and these can help achieve improvement in neonatal outcomes in addition to improved maternal health.[6,7] For example, the SEARCH project in rural India was able to achieve a 62% reduction in neonatal mortality in less than 3 years at a cost of US$5.3 per newborn using village health workers to implement these low tech interventions.[8]

However, the real challenge in improving newborn health is ensuring that the proven strategies are implemented by disseminating information on sound newborn health practices to those who need it, especially mothers or other primary caregivers, and health care providers at various levels in an appropriate manner. The WHO essential newborn care recommendations, first introduced in 1994, includes hygienic delivery practices, resuscitation, early initiation of exclusive breastfeeding within the first hour of life, maintenance of warmth, using skin-to-skin care at birth and prolonged skin-to-skin care in low-birth-weight babies, cord care and eye care as well as immunization. The WHO guidelines on essential newborn care acknowledge that cultural beliefs cannot be ignored and therefore expect that practices in this context be assessed and categorized as either good and worth promoting, harmful and to be discouraged, or harmless and to be ignored or further researched.[9,10] This is necessary to adapt the global recommendations to local settings to promote their acceptability. Studies from parts of Asia have demonstrated a high prevalence of high-risk traditional newborn care practices though these were largely among low socioeconomic groups which has led to recommendations on how to improve newborn care.[11,12,13] Available information derived from the NDHS 2013 data for Nigeria, indicate that prescribed early newborn care practices such as initiation of breastfeeding within 1 hour, breastfeeding support, cord care and postnatal review within 72 hours of life were suboptimal at rates of 34.4%, 22.6% and 24.3% respectively even among facility deliveries.[14] Not much information is available locally to show how the infant care practices in this locale compare with the essential care recommendations. The aim of this study was to assess newborn care practices in the community during the first week of life in Ibadan, Nigeria, and determine whether they conformed to the essential newborn care standards. This was done with the hope that the information obtained will be useful in adapting the essential newborn care package to suite cultural practices in order to promote acceptability of these evidence-based interventions and achieve improvement in newborn care.

METHODS

Study Design and Site

This cross-sectional survey involved recruitment of mothers who delivered their babies at Adeoyo Maternity Hospital (AMH), Ibadan, Nigeria over a 3-month period. The hospital is the largest secondary maternity care provider in Ibadan, South West Nigeria and has over 4000 deliveries per annum. The AMH is in a suburban area of the Ibadan metropolis, the capital city of Oyo State. The hospital provides maternity services to all strata of social class and serves as a referral centre to other government-owned and private health care facilities in the city. It has facilities for inpatient newborn care. Mothers and newborns requiring tertiary care are usually referred in utero or perinatally to the nearby teaching hospital.

Selection of Participants and Data Collection

Based on the documented delivery rate at Adeoyo hospital, we projected that 1100 mothers would possibly deliver in the hospital within a 3-month period and assumed that an estimated 50% would adhere to essential newborn care standards since the compliance rate in the region at that time was not known. Using the sample size for single proportion estimation, 707 participants were calculated as the minimum size needed to achieve a 95 percent level of confidence and a margin of error of 2.5 percent and allowing for an attrition rate of 10%. All live-born babies delivered

during weekdays or if delivered on weekends but were not discharged before the next weekday (because the research assistants only worked on weekdays) were recruited into the study. The mothers were visited in their homes at the end of the first week of life (between the 8th and 10th days by which time, the naming ceremony rites would have been performed and relations would be ready to attend to such visitors). Babies who were admitted for further care and those referred to other hospitals were excluded. The mothers' demographic details were obtained by direct interview in the hospital after delivery and obstetric details obtained from hospital records. Research assistants visited the families at home at the end of the first week and questions on infant care practices, history of illnesses and care seeking during the first week were obtained with the use of semi-structured questionnaires. The questionnaires were pretested among 20 women in a tertiary facility in the same geographical location prior to commencement of the study.

Ethical Considerations

Participation in the study was entirely voluntary and informed consent was obtained. Participants were made aware that they could withdraw at any time and that they would continue to receive routine hospital treatment. The Oyo State Ministry of Health Ethical Review Committee in Ibadan, Nigeria, reviewed the study proposal and provided ethical approval.

RESULTS

A total of 713 mother-baby pairs were recruited during the study period, but only 678 mothers' addresses could be traced and were visited at the end of the first week of life. All the visits were conducted between the 8th and 10th days of life of the babies. Of these 678 mothers, 25(3.7%) had twin deliveries while one mother (0.15%) had a set of triplets, giving a total of 705 babies.

Mothers' Demographic Characteristics

Majority (96.6%) of the mothers were Yorubas, 15 (2.2%) were Igbos, 1 mother was Hausa, 5 were from 5 other ethnic groups of Nigeria while one mother was not a Nigerian. Twenty-six (3.8%) of the mothers were teenagers, 11 (1.6%) were aged ≥ 40 years while the other 641 (94.6%) were aged 20 to 39 years. Two hundred and twenty-six mothers (33.3%) were having their first babies, 163 (24.0%) had 1 previous baby, 146 (21.5%) had 2, 91 (13.4%) had 3 and 52 (7.6%) had 4 or more previous babies. Close to half of the mothers (43.5%) had up to secondary level of education, 29.9% completed primary education, 18.6% had post-secondary but not university education, 4.9% had up to university education while only 3.1% had no formal education. Only 198 (29.2%) of the mothers were working either for government (13.6%) or private establishments (15.6%) and all others were either self-employed or not in any employment at all at the time of delivery. Of the 198 working class mothers, 10.1% were not entitled to any maternity leave, 53% were entitled to 6 weeks maternity leave, 14.6% had > 6 but < 12weeks while only 19.2% were entitled to ≥12 weeks maternity leave.

Antenatal Care Information

Majority (95.3%) of the mothers had some form of antenatal care (ANC) at different levels of health care with the number of antenatal visits varying from 1–8 as shown in Table 1. Of these, 368 (57%), 291(45%), 192 (29.7%) and 182 (28.2%) mothers acknowledged being given information during ANC on breastfeeding, cord care, provision of warmth and eye care respectively.

Gestational Ages and Birth Weights

Five hundred and fifty (81%) of the deliveries were term, 106 (15.8%) were preterm and 22 (3.2%) were post term. The birth weight of the babies varied from 1500g to 5000g with a mean ± SD of 2920g ± 470g. All the mothers were discharged home with their babies between 6 and 48hours after delivery except 11 (1.6%) mothers who had caesarian section and were discharged home after 5 days.

Assistance with Child Care at Home

One hundred and forty-one mothers (20.8%) had nobody assisting them at home with childcare while others had their mothers (20.5%), mothers in-law (49.7%), neighbours (3.8%) and other friends (5.2%) assisting either living in (39%) or coming in daily (40.2%) to help. Half of these people assisting with child care had no formal education, while a third had only primary or incomplete secondary education and 11.7% had complete secondary education or teachers grade 2 certificates. Very few, had up to university education (1.1%) or post-secondary but not university (3.6%). In taking decisions that pertain to the care of the baby, the fathers had the final say in 79.1% of cases, mothers and grandmothers in 14.2% and 6.7% of cases respectively.

Hygiene Practices

None of the mothers was made to wash their hands on arrival in the hospital. Only 63 (9.3%) mothers had the habit of

Table 1: Antenatal Care Status of Mothers

	No. of Mothers	%
Any ANC		
Yes	646	95.3
No	32	4.7
Place of ANC		
General Hospital (Adeoyo)	574	84.7
Catholic Hospital, (secondary facility)	2	0.3
Private Hospitals	36	5.3
Primary Health Care	18	2.7
Mission Home	16	2.4
No of Antenatal visits		
<4	139	20.5
4 – 7	416	61.4
≥8	91	13.4

ANC, Antenatal Care

washing their hands always before handling their babies, 566 (83.5%) mothers did so some of the times while 49 (7.2%) mothers never did. However, after every nappy change, 637 (94%) mothers routinely washed their hands, 84 (12.4%) with only water, 552 (81.4%) with soap and water and 1 with antiseptic solution.

Feeding Practices

Breastfeeding was the first method of feeding most babies (93.8%) but only a fifth (21.6%) of the mothers had put their babies to breast by one-hour of age, while 19.7%, 13.8% were first fed by 2 and 3 hours of age respectively. A significant proportion of the babies (40.8%) did not get fed until 4 – 24 hours of age while the remaining 4.1% were fed between 25 and 78 hours. Other types of first feed given and reasons for their choices are as shown in Table 2. Most (85.5%) of the mothers gave their babies colostrum and 99.4% of those who breastfed believed it was the best for their babies.

By the end of the first week of life, the exclusive breastfeeding rate had dropped to 71.2%, 22.0% of the mothers had added water to breastfeeding, 4.6 % added formula feeds, 1.8% added herbs while 0.4% were on exclusive formula feeding because the mothers were HIV positive. Most (85%) of the mothers fed their babies on demand and 97.2% were feeding their babies at 1–2 hourly intervals. Of the 34 mothers who were giving formula, 26 gave it because they felt they couldn't cope with exclusive breastfeeding, 5 because the mothers were sick and 3 because the mothers were HIV positive.

Table 2: First Feeds given by Mothers and Reasons for Choices other than Breastfeeding

	N	%
Type of Feed		
Breast feeding	636	93.8
Plain water	20	3.0
Glucose water	18	2.7
Formula feed	4	0.6
Reasons for their choices		
Best for my baby	16	2.4
No breastmilk yet	16	2.4
I was too weak to breastfeed	7	1.0
Baby was weak to suck	3	0.4

Table 3: Newborn Danger Signs Acknowledged by Mothers and Clinical Signs Observed in the Babies by Mothers in the First Week of Life

Danger Signs known/Clinical Signs observed	Frequency (%) N = 678
Danger Sign known by Mothers	
Umbilical redness	492(72.7)
Yellowness of the hands and soles of feet	507(74.7)
Skin pustules	509(75.1)
Poor suck	498(73.4)
Fever	510(75.2)
Fast breathing	499(73.6)
Reduced activity	499(73.6)
Ear discharge	497(73.3)
Diarrhoea	497(73.3)
Clinical Signs observed in the babies	
Eye discharge	291 (31.1)
Umbilical redness	6 (0.9)
Yellowness of palms and soles	10 (1.5)
Skin pustules	14 (2.0)
Reduced activity	11 (1.6)
Ear discharge	7 (1.0)

Provision of Warmth

Some of the mothers (16.6%) gave their babies a bath on the first day of life while 70.4% did so on the second day of life. Most mothers (82%) kept their rooms warm by keeping most of their windows shut all day, 41.2% ensured that fans or air-conditioners were not switched on, 9% lit kerosene wick lanterns or some kind of fire indoors while 1.2% used electric room heaters. Apart from keeping their rooms warm, mothers employed various means (multiple methods in some cases) of keeping babies warm which included strapping to the back, wrapping in shawls in addition to clothing, wearing socks and bonnets in addition to clothing, wearing multiple layers of clothing in 71.4%, 53.8%, 21.7% and 4.6% of cases respectively. Direct skin to skin care was employed in only 2% of cases.

Cord Care Practices

Though the national policy on chlorhexidine was in place but chlorhexidine gel was not available in the hospital or pharmacies around at the time of the study hence no baby had chlorhexidine applied on the cord. The umbilical stumps were cleaned with alcohol and exposed in 97.2% of cases, alcohol and then bandaged in 2.4%, hot fomentation with herbs 0.3% and nothing in 0.2% of cases. By the 8th day of life, the umbilical stump had dropped off in 80.1% of babies. Of this number, after the stump dropped, 87.5% were still being cleaned with alcohol and open dressing, alcohol and occlusive dressing in 2.4% of cases. Hot fomentation with herbs was applied in 8.7% of cases, 1% applied other antiseptics and 0.4% did nothing. Pus around the umbilicus was observed in 5 babies of which 1 mother reported in the hospital while others just cleaned at home. Redness around the umbilicus was observed in 9 babies, and 2 mothers applied some kind of powder while others just ignored.

Eye Care Practices

The routine care of the eyes included cleaning the face with soap and water while bathing (70.2%), instillation of drops of breastmilk (18.2%), instillation of antibiotic eye drops (3%) while the remaining 18.6% did nothing in particular. No baby had antibiotic ointment or drops applied in the hospital at delivery. Almost a third (31.1%) of the babies had developed eye discharge within the first

week of life. When the babies developed eye discharge, 88 mothers (40.1%) treated by instillation of drops of breastmilk, 23 mothers (7.9%) treated by cleaning with wet cotton wool, 6 (2.1%) applied antibiotic eye ointment/drops, 5 (1.7%) consulted hospitals, 2 applied native medication made with lead fillings, one mother administered antibiotic syrup while 13 mothers did nothing at all.

Follow Up Visits to Clinics

Apart from immunization visits, 98 mothers (14.5%) had taken their babies back to the hospital for postnatal checks while 25 had been visited at home by health care providers. These home visits were however on social grounds as the hospital did not provide any domiciliary service.

Immunization

Babies of mothers who had not been discharged before immunization days had their vaccines prior to discharge while others had to come back on immunization days, which was usually once weekly. By the end of the first week of life, only 393 babies (55.7%) had received their BCG vaccines, 413 (58.6%) had received OPV and 410 (58.2%), HBV. About 3% who had OPV and/or HBV but no BCG was due to non-availability of the vaccines in the hospital at the time of visit. The rest had not been vaccinated at all and the reasons given were that they planned to go later 93 (19.2%), vaccines not available at 1st visit 12 (1.7%), and mother was too sick to take the baby back 4(0.6%). One mother each felt that vaccination was unnecessary and that it was forbidden in their family. No specific reasons were given by 154 (22.7%) mothers but nobody gave reasons of financial constraints.

Recognition of Danger Signs

Many of the danger signs listed in the essential newborn care document were acknowledged by majority of mothers as shown in Table 3. Some of the babies had developed some of these signs within the first week of life (Table 3).

On noticing these clinical signs, a number of mothers employed some self-prescribed interventions for eye discharge (42.6%), yellowness of palms and soles 2(20%), umbilical redness and skin pustules 2.2%. Only 1.7% sought medical attention for the eye discharge. No help or interventions were sought for the other conditions.

DISCUSSION

This study showed that some of the methods of child care employed by the mothers in Ibadan, South West Nigeria, are in partial compliance with the provisions of the essential newborn care guidelines. For example, exclusive breastfeeding was practiced by 93.8% of mothers around the time of delivery though the rate had dropped to 71% by the end of the week. However, only a fifth of the mothers had initiated breastfeeding by the first hour of life and this is a reflection of the instructions and support given by the health care workers. This rate of early initiation is lower than the 34% in the 2013 NDHS figure for the country and much lower than 66.4% that was reported from Nepal[15] another developing country. The need to ensure that all health care workers are adequately trained in essential newborn care and the necessary job aids like the action plans are provided and conspicuously displayed in the health facilities is highlighted. It has been shown that early initiation of breastfeeding is associated with a 21% reduction in all cause neonatal mortality just as it has been shown that delayed initiation beyond 1 day is associated with a 2.4 fold increased risk of neonatal mortality.[16,17] In addition to reducing neonatal mortality early initiation of breastfeeding, also helps in the successful establishment of breastfeeding. In order for the practice of early initiation to be entrenched, the health workers need to be adequately trained to support and ensure compliance according to the essential care guidelines. Mothers too need to be educated prior to delivery and this does not require high level manpower to achieve. In Nepal a significant improvement in early initiation rate was brought about by interventions which included the introduction of programmes which trained and used female volunteers in the community to educate and counsel mothers prior to delivery. Similar to the Nepal experience, in Bolivia and Madagascar, significant improvements in rates of early initiation were obtained within a very short period of introducing the "LINKAGES" project which adopted behaviour change communication approach by providing simple but specific health messages through various channels in the communities.[18] These observations indicate that in resource limited settings, a lot of improvement in practices relating to breastfeeding can be achieved with community involvement. Such community-oriented interventions can take advantage of the fact that many mothers utilize antenatal care services and family member involvement in child care was prevalent in this study. As shown in this study, 80% of the mothers had up to 4 or more antenatal visits to the healthcare facility while up to 80% also had people assisting them with child care. These provide good opportunities for behaviour change communication messages to be shared. As shown in this study the father had the final say in decisions pertaining to the care of the child and as such, they are a very important group to be targeted in behaviour change communications in order to achieve desired results. The study found that exclusive breastfeeding rates had dropped to 71% by the end of the first week with a majority of them adding water. This might be related to traditional beliefs in the study setting hence, information specifically discouraging this practice needs to be inculcated in breastfeeding education.

Hand hygiene is one of the most important steps in the prevention of infection in newborns. This practice was however not well grounded in this study population as only 9.3% of the mothers routinely washed their hands before handling their babies. Unfortunately, the hospital did not seem to help this practice as none of the mothers was made to wash hands on arrival in the labour ward. This was a great opportunity to reinforce hand hygiene missed. This is an aspect of essential newborn care training that is so well emphasized and supportive supervision as well as adequate provision of facilities for hand washing is essential in ensuring this practice is entrenched.

Warmth is one of the essential needs of newborns and this is promoted

in the essential newborn care course for health care workers. Only a negligible number mothers practiced skin to skin care which is a key component of the warm chain at the time of birth and it is the primary responsibility of the health care staff to initiate this. It is not known why the mothers were not made to do this for their babies but it shows that a lot is still required to be done to ensure full compliance with provisions of the essential newborn care by health care staff. If practiced, it would have provided the opportunity for the mothers to practice skin to skin care or to learn about it and encourage their peers to practice it. Majority of the mothers however took various steps to ensure warmth in their babies, such as not bathing in the first 24 hours, wrapping the babies and keeping their rooms warm. It is worthy of note that 9% of mothers engaged in some harmful practices like making fire or using kerosine wick lanterns indoors. None of these indoor fires were standard heating systems and they carry the danger of fire accidents as well as indoor pollution, carbon monoxide and other hydrocarbon poisoning with their attendant consequences especially the kerosine wick lantern.[19] The implication is that mothers recognize the need for warmth in their newborns but they need to be educated on safe methods and unsafe methods discouraged. Providing such information should not be considered too mundane while givimg regular education during antenatal care.

Skin to skin care in the first hour of life is a mandatory component of essential care for every baby that health care workers ought to offer every newborn. It might be informative to engage in qualitative research in this setting regarding the healthcare workers and community perception and acceptance of the recommendations of essential newborn care in order to understand why this recommended practice has not gained grounds. Training in essential newborn care coupled with supportive supervision has been used to improve compliance with provisions of essential newborn care in other LMICs.[20]

With respect to cord care, chlorhexidine gel as recommended in ECEB was not yet available locally at the time of the study, however majority (97%) of mothers complied with the recommendation in place at that time which was to clean with alcohol without occlusive dressing. A substantial number (9%) of mothers applied herbs and other unorthodox substances to the umbilicus after the cord stump had fallen off. This is similar to reports from Jos in North central Nigeria where 73.2% of mothers did cord care with methylated spirit as recommended but 22.2% still applied other substances.[21] There are several traditional ways of cord care in many LMICs, a lot of which predispose to infections including tetanus but the primary aim is usually borne out of the desire to actively care for the cord.[22] This is potentially dangerous and may negate the gains of chlorhexidine when there is full uptake. The emphasis of the ECEB is on chlorhexidine for the cord but nothing about after the cord has separated. It is therefore necessary to instruct mothers on what not to do in addition to what to do as well as care after the cord stump has dropped. In order to facilitate uptake of the recommended guidelines, policy makers should take advantage of the desire to actively care for the cord and recommend safe practices that align with local cultures.

Eye care practices by the mothers was also not compliant with ECEB recommendations as none of the babies had the recommended antibiotic ointment at birth (not yet available at the time of the study). Up to a quarter of the mothers applied various substances including breast milk at home and even among those whose babies developed eye discharge in the first week. Only 1.7% of them consulted health care workers, 2.1% self-medicated with antibiotic eye ointment or drops and out rightly dangerous substances like lead fillings when their babies developed eye discharge. This is another aspect of newborn care that requires urgent attention but as seen in this study, has not received as much focus as cord care. The mucosa of the eyes can serve as portal of entry for microorganisms at the time of delivery or afterwards hence the recommendation in ECEB for application of erythromycin eye ointment within 90 minutes of birth. It is not enough to tell them what to do but also what not to do.

The immunization status of the babies in this study was such that over 40% had not received any vaccines at the end of the first week, only 58% had received hepatitis B vaccine. It is particularly important for hepatitis B vaccine to be administered in the first 24 hours to prevent perinatal transmission of hepatitis B and reduce the risk of chronic hepatitis.

The practice of having one immunization day per week in the hospital for logistic reasons may have contributed to this. Babies delivered on days outside this immunization day would therefore be required to come back on the next immunization day. Considering the cultural practice of having a naming ceremony on the 8th day of life in the geographical location of the study site;[23] parents are likely to further defer the immunization till another week. As seen in this study, about 35% of the mothers planned to go later or gave no specific reasons for not having had the immunization. Such later dates may never come. Another factor recognized in this study was that some of the vaccines expected to be given were not available hence some of the babies had received oral polio and hepatitis B vaccines but not BCG. In order to ensure timely immunization for these babies, such policies of once a week immunization days need to be reviewed as well as ensuring regular availability of necessary vaccines to prevent apathy on the part of the parents.

A study in a rural area in the same geographical location reported that only 19.4%–35.4% of babies had received HBV, BCG or OPV0 within the first 7days of life and the reasons for this poor vaccine uptake were similar to our findings.[24] The slightly higher immunization rate in our study may be due to the fact that the study was among babies born in the hospital located in a semi urban area. A systematic review of timeliness of immunization has reported low coverage for BCG and HBV at birth with no significant difference in coverage between babies born in and outside health facilities in sub-Saharan Africa.[25] The issue of provision of the vaccines

and necessary logistic support to make timely immunization at birth or within a few days possible, needs to be addressed. The community needs to be made to appreciate the value of these vaccines so as to promote acceptance in order to reduce disease burden from vaccine preventable causes in the immediate period as well as improve long-term health.

This study showed that newborn care practices in Ibadan are not substantially compliant with most aspects of essential newborn care guidelines aimed at improving newborn survival. This is in spite of a large proportion of mothers having received antenatal care and also acknowledging that they were given information during ANC on various aspects of childcare. It is therefore not surprising that neonatal mortality rate has not changed much over the years despite the numerous health care policies in place. The need to examine the content of information given during ANC and health care staff and families' perspectives of the methods of infant care promoted by ENCC is therefore highlighted.

In order to achieve the desired outcomes in newborn health, every health care worker has to buy-in to these simple, low tech, inexpensive interventions of the essential newborn care guidelines. Education and support of family members on safe newborn care practices should be given priority during antenatal care in order to ensure mothers are well informed. Qualitative research to examine why the compliance of health care staff and mothers' newborn care practices with provisions of the essential newborn care is not optimal is recommended so as to fashion ways to improve compliance. This is necessary in order for the efforts put into training of health care staff on essential newborn care to achieve the desired results.

Information on vitamin K administration was not obtained in this study as the focus was on care practices at home by the mothers and family members. Mothers' recognition of danger signs and their health care seeking behaviour also have roles to play in early identification and prompt treatment of sick newborns but information on these were not obtained as it was not within the scope of this work. This is another aspect that needs to be explored in future research to identify areas of gap that should be addressed for the essential newborn care package to have maximum impact.

A similar study from Ethiopia showed that the level of compliance of newborn care practices with essential newborn care provisions was low especially with regards to early initiation of breastfeeding, delaying bathing, cord care and health seeking behaviour.[26] The levels obtained from their study also differed widely from the levels of compliance obtained from other parts of their country. This further highlights the need to determine level of compliance in different geographical regions and factors determining compliance in order to achieve good uptake of the essential care provisions for improved newborn care.

The scope of the study did not assess if the health care staff at the hospital had been trained in ENCC hence the influence of the health workers' knowledge on the degree of compliance of the mothers with essential care provisions could not be evaluated.

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Duality of Interest

None declared.

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