



ORIGINAL ARTICLE

Neonatal Cord Care Practices among Mothers and Caregivers in the Volta Region of Ghana

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ABSTRACT

Background: The umbilical cord is a major route of infection among newborns. In Ghana, infections among neonates accounts for majority of under-five deaths. This study sought to investigate what mothers apply to the umbilical cord of their newborns and what motivates them to put such applications on the cord.

Methods: This was a descriptive cross-sectional study of neonatal cord care practices among mothers and caregivers in the Nkwanta South District of the Volta region of Ghana. Quantitative and qualitative methods were used.

Results: Majority of the mothers/caregivers used substances that have not been recommended for umbilical cord dressing (64.3%). Factors such as level of education [$\chi^2=8.2$, $p=0.02$], place of delivery [$\chi^2 = 40.1$, $p<0.001$], relationship with whoever has made a recommendation for a particular dressing to be used [$\chi^2=95.2$, $p<0.001$] and number of days it takes the umbilical cord to fall off [$\chi^2=6.2$, $p=0.05$] were found to influence the type of dressing used on the umbilical cord.

Conclusion and Global Health Implications: In order to reduce the number of neonates who die due to avoidable cord-related infections, the type of substances used on the umbilical cord should be approved substances. Health education particularly on neonatal cord care targeting community members and health care providers at the lower levels of the healthcare delivery system should be intensified.

Key words: Umbilical cord • Neonates • Newborns • Rural • Dressing • Infections • Ghana

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1. Introduction

Newborn umbilical cord infections occur in many settings, however, children born in developing countries are more susceptible particularly when births are not skilled birth attended.¹ According to the World Health

Organization (WHO), there were 2.6 million under-five deaths in 2016, neonatal deaths accounted for 46% which translates into the death of 7000 newborns every day.² Data have shown that the primary causes of newborn deaths are infections (32%), asphyxia (23%) and prematurity and low birth weight (27%).³

Many of these deaths are as a result of infection of the umbilicus, which stem from cultural and/or traditional practices within communities.^{2,4} The umbilical cord is proven to be an ideal substrate for bacterial growth, it also provides a direct route for bacteria to access the bloodstream of the newborn which can cause sepsis and lead to death.^{2,5,6} Various substances are applied to the cord in different parts of the world all geared at mitigating the risk of infection, however, not all are approved and safe. Cord care practices immediately after delivery play a major role in reducing neonatal morbidities and mortalities. In Pakistan, some villages are known to use cow dung on the umbilical cord; in some communities in Ethiopia, butter, petroleum jelly and hair lotion are applied on the cord to promote healing.^{5,7} Bennet et al., found that nearly one-third of newborns in Pakistan had ghee heated with dung fuel applied to their umbilical cord. Their findings revealed a significant association between the topical application of ghee heated with cow dung and neonatal tetanus.⁷ In Zambia's Choma District, many deliveries are done outside of health facilities, and this gives way for the use of many different applications on the umbilical cord. Mothers are known to apply substances like petroleum jelly, cooking oil, baby lotion and breastmilk on the umbilical cord. There are some who apply powders of roots, burnt gourds and ashes.⁸ Alam et al. conducted a study in Bangladesh in Sylhet District; their results revealed that substances such as mustard oil, ash, mud, mother's saliva, ginger and/or chewed rice are applied to the cord. Nine percent (9%) of their participants reported umbilical cord infections of their infants.⁹

A Baby-Friendly Hospital Initiative (BFHI), was launched in 1991, by the United Nations Children Fund (UNICEF) and the WHO aimed at ensuring that all maternities, whether free standing or in a hospital, become centers of breastfeeding support; in addition, practices such as clean cord care, thermal care, and initiating breastfeeding immediately after birth (within 1 hour) were advocated.¹⁰ The current guideline on newborn health as outlined by WHO recommends the daily use of chlorhexidine (4%) on the umbilical cord stump during the first week of life for babies born at home especially in areas that

record high neonatal mortality, i.e. above 30 per 1000. In areas that record low neonatal mortality, dry cord care is recommended for newborns born in health facilities or at home, however, chlorhexidine is opted for as a replacement of unapproved or harmful traditional substances such as cow dung.¹¹

The World Health Organization issued a new recommendation for umbilical cord care in January 2014. In view of this new directive, the Ministry of Health and Ghana Health Service conducted extensive operations research on the use of the chlorhexidine digluconate 7.1% gel for cord care. The newly approved product, chlorhexidine digluconate 7.1% gel is a replacement of methylated spirit which has been used for umbilical cord care for many years.¹² In spite of the fact that methylated spirit was recommended for use on the umbilical cord, mothers/caregivers are believed to use unapproved substances on the cord. Thus, this study sought to assess mothers/caregivers umbilical cord care knowledge and practice culture for neonates in Nkwanta South District of Ghana.

2. Methods

This was a descriptive cross-sectional study. It involved the use of both quantitative and qualitative methods for data collection. A survey was conducted for the quantitative aspect and in-depth interviews (IDIs) and focus group discussions (FGDs) for the qualitative part. The study was conducted in Nkwanta South District of the Volta Region of Ghana – this region is located in the South eastern part of the country. This paper presents results of the practice culture of mothers/caregivers with respect to neonatal cord care. The study was conducted from July - December 2017.

The target population for this study were mothers/caregivers with children not more than two years old. In order to reduce recall bias mothers whose children were above two years of age were not selected for the study. In-depth interviews were conducted for traditional birth attendants (TBAs) and focus group discussions for grandmothers. Nkwanta South, a district in the Volta Region of Ghana was purposively selected for the study due to a high record of deliveries outside the health facility

particularly at home by traditional birth attendants and sometimes the grandmothers of the expectant mothers. Supervised delivery was 33.6% compared with 38.3% TBAs deliveries in 2015. Most villages in the District are inaccessible by road and even where the roads exist; they usually become impassable during the rainy season which also contributes to the substantial number of home deliveries. The three major causes of neonatal mortalities in the district in 2015 were neonatal sepsis, birth asphyxia, and pneumonia.¹³

In the selected study district, the sub-district with the highest record of home deliveries was purposively selected for the study. The EPI “30 x 7” cluster sampling technique was adapted for use in this study.¹⁴ Thirty (30) communities were randomly selected from the sub-district and seven (7) respondents were then randomly selected from each of these communities. A total of 210 respondents were interviewed for the survey. In-depth interviews were conducted with four (4) traditional birth attendants who were purposively selected based on the number of years they have assisted women deliver. In addition, two focus group discussions were held with grandmothers. This group was also purposively selected to find out their influence on the kind of substances mothers apply to the umbilical cord of their newborns.

The dependent variable was the type of dressing applied to the umbilical cord of the newborn. The independent variables were: where the mother delivered the baby, the mothers’ educational level, how long it took the umbilical cord to fall off and relationship with people who made recommendations for a particular type of dressing to be used.

Data entry was done using EpiData 6.1 and analysed using STATA version 11 (STATA Corporation, College Station, Texas). Basic descriptive statistics such as frequencies were calculated for all the variables. The Chi square test was done to establish associations between the dependent and independent variables at a 95% confidence level, and independent variables found to be associated with the outcome variable were established using multiple logistic regression.

The in-depth interviews and focus group discussions were tape recorded and transcribed verbatim. They were put in a matrix pre-coded using the interview guides. Emerging themes were collated and included in the matrix. The Ghana Health Service ethics review committee approved the study protocol (GHSERC13/05/17). Permission was granted by the District Health Directorate to conduct the study in the District. A written informed consent was obtained from all participants before being included in the study. Confidentiality and anonymity were ensured.

3. Results

Most of the study participants were between the ages of 25 – 29 (29%), majority (61%) had no formal education and farming/fishing (64.8%) was the main occupation of the participants in the study (Table 1).

Table 2 shows a univariate analysis of the type of dressing respondents used prior to the falling off of the umbilical cord and what they used after it had fallen off. The recommended cord dressing (methylated spirit) was used by 35.7% (75) of the respondents while the remaining proportion 64.3% (135) used substances that have not been recommended such as shea butter, toothpaste, chalk, sand, salt, petroleum jelly, baby lotion, penicillin and amoxicillin. In focus group discussions with some selected grandmothers in the community, they outlined what they use on the

Table 1: Background characteristics of study participants

Characteristics	Category	N	%
Age	13 – 19	31	14.8
	20 – 24	38	18.1
	25 – 29	61	29.0
	30 – 34	35	16.7
	35 – 39	29	13.8
	40 – 44	16	7.6
Level of education	Primary/Junior High school	76	36.2
	Senior High school/Tertiary	6	2.9
	No formal education	128	61.0
Occupation	Industry/Civil servant	18	8.6
	Farming/Fishing	136	64.8
	Artisan	37	17.6
	Unemployed	19	9.0

umbilical cord. The findings were in line with what was revealed in the quantitative data.

“We use hot water and then we smear shea butter on the umbilical cord, some of us use toothpaste on the umbilical cord ...” (FGD, Grandmother)

“We grind a certain leaf, mix it with salt and then we apply on the cord” (FGD, Grandmother)

The trend in the use of recommended and unrecommended substances for cord dressing after the cord has fallen off is again evident in what caregivers used after the umbilical cord had fallen off. Majority (85.7%) of the mothers used substances that have not been recommended for cord dressing

such as shea butter and hot spirit water and 14.3% of the mothers used methylated spirit (Table 2). Responses from the in-depth interviews with the traditional birth attendants (TBAs) supported the results in the quantitative study, they also gave reasons why such substances are applied to the umbilical cord.

“They use lukewarm water to massage the wound. They also use Shea butter or penicillin ointment” (IDI, Traditional birth attendant)

“Once it has fallen, after bathing the newborn you apply Shea butter on the wound. The Shea butter prevents air from entering the baby through the cord” (IDI, Traditional birth attendant)

Table 2: Univariate analysis on type of dressing used before the umbilical cord fell off

Type of dressing	Dressing used before umbilical cord fell off		Dressing used after umbilical cord fell off	
	N	%	N	%
Approved dressing	75	35.7	30	14.3
Unapproved dressing	135	64.3	180	85.7

Table 3 shows that the level of the mother’s/caregiver’s education has an influence on the type of dressing they use on the umbilical cord ($\chi^2 = 8.24$, $p=0.016$). The place of delivery ($\chi^2 = 40.12$, $p<0.001$) and who recommended a type of dressing ($\chi^2 = 95.19$, $p<0.001$) were also found to be significant, thus mother’s/caregiver’s use of a particular type of dressing depends on where they delivered their baby and who recommended a type of dressing. The number of days it take the cord to

Table 3: Bivariate analysis on the effect of the independent variables on the type of dressing used on the umbilical cord of newborns

Independent variables	Approved dressing (%)	Unapproved dressing (%)	X ²	p
Level of mother’s/caregivers education			8.240	0.016
No formal education	36 (48.0)	92 (68.2)		
Primary/JHS	36 (48.0)	3 (4.0)		
Secondary/Tertiary	3 (4.0)	3 (2.2)		
Place of delivery			40.125	<0.001
Health facility	50 (66.7)	31 (23.0)		
TBA	11 (14.7)	31 (23.0)		
At home	14 (18.7)	73 (54.1)		
Relation with person who made a recommendation			95.189	<0.001
Nurse	46 (63.3)	4 (3.0)		
Grandmother	13 (17.3)	85 (63.0)		
TBA/friend	10 (13.3)	20 (14.8)		
No one	6 (8.0)	26 (19.3)		
Number of days it takes the cord to fall off			6.186	0.045
Less than 4 days	12 (16.0)	29 (21.5)		
4 days	33 (44.0)	74 (54.8)		
5-8 days	30 (40.0)	32 (23.7)		

Table 4: Results of multiple logistic regression analysis predicting type of substances mothers use on the umbilical cord

Variable	B	p-value
Mother's education	0.07	0.02
Place of delivery	0.15	<0.01
Persons who recommended a type of dressing	0.14	<0.01
Number of days it takes cord to fall off	0.06	0.16

fall off ($\chi^2 = 6.19$, $p=0.045$) was also a factor that influences the mother's/caregiver's on what to use on the cord.

Multiple logistic regression analysis was conducted to predict the type of substances mothers or caregivers use on the umbilical cord using variables that were significant in the chi square analysis (Table 4). Of the four variables entered into the regression model, three remained statistically significant predictors of the type of substances mothers/caregivers use on the umbilical cord of their newborns. The mothers education ($p=0.02$), place of delivery ($p<0.05$) and the relationship with the person who made a particular recommendation ($p<0.05$).

4. Discussion

This study found several factors that influence the type of substances mothers/caregivers apply to the umbilical cord of their newborns. Results show that mothers and caregivers use different products or dressings on the umbilical cord, as many as 64.3% of respondents from this study used unapproved dressings such as shea butter, herbs, salt, ground banana peels mixed with shea butter, sand mixed with salt, chalk mixed with salt and strong antiseptics such as Dettol. Results from a study conducted by Waiswa et al. in Uganda and Amare in Ethiopia corroborate results from this study.^{5,15} Women were found to use substances like baby powder, herbs, spirit, soapy water, salty water, butter, petroleum jelly, and hair lotion for cord dressing.

The level of mothers/caregivers education was found to be associated with the type of dressing they would use on the cord. Majority of those who had not received any formal education (68%) were found to

use unapproved substances on the cord. Abhulimhenlyoha and Ibadin also found that most mothers/caregivers who had attained at least primary level education adopt the use of approved dressing such as methylated spirit. For cord care, whilst, mothers with no formal education are more likely to use unapproved dressings on the umbilical cords of their newborns.¹⁶

Another factor that was found to affect the type of dressing used is the place of delivery. In this study a greater number of women delivered outside the health facility (61.4%) compared to 38.6% who delivered in a health facility. This is in accordance with studies by Ambe et al. and Medewase et al. which also revealed that the use of unapproved topical applications was more common among mothers of babies who were not delivered at a health facility.^{17,18} In addition to the place of delivery, the mothers/caregivers relationship with whoever recommended for a particular type of dressing to be used was found to be significant. The choice of the type of dressing used was influenced by mainly nurses for the approved dressing whilst the use of unapproved dressings was influenced by either grandmothers of the babies (63.0%) or traditional birth attendants or friends (14.8%).

Again the time it takes the umbilical cord to fall off was found to be significant during the chi square analysis but not after the multiple regression analysis. Cultural beliefs of communities influence how long mothers/caregivers accommodate the umbilical cord before it falls off. In this present study, a greater number of the participants (54.8%) believed that the cord should be detached by the 4th day. Results from a study by Hill et al., revealed that participants with newborns whose cords were not detaching quickly use drying agents to accelerate the detaching process.¹⁹ Also Mukhtar-Yola M showed that the differences in cord separation time could be attributed to the effect of unapproved cord care practices. On the other hand, mothers who used more of approved cord dressing were mothers whose babies' umbilical cord had 4 days of separating from the stump.²⁰

4.1. Limitations

Our study was conducted in only one sector of the country. It would have been desirable if the study

had been conducted in different parts of the country in order to have a fair idea of what people across the different cultural divide in Ghana apply to the umbilical cord of their newborns and what factors influence the use of such substances. Our findings are however of relevance to the study area and also adds to the body of knowledge on the subject.

5. Conclusion And Global Health Implications

This study has demonstrated that some sections of the population in Ghana still use unapproved substances on their newborn umbilical cord care. There is therefore the need to intensify public education particularly targeting those in the lower rungs of the educational ladder; traditional birth attendants and grandmothers. This will potentially contribute to the reduction in the neonatal mortality rate in the country. The education can be channelled through health personnel who live in rural areas.

Compliance with Ethical Standards

Conflicts of Interest: *The authors declare no conflict of interest.* **Funding/Support:** *The study was funded by Global Affairs Canada.* **Ethics Approval:** *Ethical approval was obtained from the Ghana Health Service Ethics Review Committee (GHSERC13/05/17). Informed written consent was obtained from all the participants of the study and confidentiality was assured and ensured.*

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Key Messages

1. Behaviour change communication should be incorporated into health education packages in order to change the attitude of mothers and caregivers towards the use of unapproved substances for umbilical cord care.
2. Factors associated with low delivery rates of pregnant women at health facilities should be investigated and appropriate recommendations rolled out.
3. Community outreach programs should be intensified.

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