

# Determinants of Umbilical Cord Care Practices among Mothers of Neonates Admitted into Special Care Baby Unit of Usmanu Dan Fodiyo University Teaching Hospital, Sokoto, Nigeria

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## ABSTRACT

**Introduction:** Cord care practices can directly contribute to infections in new-born which account for large proportion of million annual neonatal deaths. Cord care infections are more prevalent in developing countries due to high rate of unhygienic cord care practices. The study aimed to determine the factors that influence umbilical cord care practices among mothers whose neonates were admitted into Special Care Baby Unit of Usmanu Danfodiyo University Teaching Hospital, Sokoto.

**Material and Methods:** This was a cross-sectional study carried out among 263 mothers whose neonates were admitted into Special Care Baby Unit of the Usmanu Danfodiyo University Teaching Hospital, Sokoto, between 1<sup>st</sup> January to 30th June 2017. A structured questionnaire was used to extract information on their biodata and possible determinants of cord care practices. The data was analysed using SPSS version 20.

**Results:** Majority of the mothers (67.3%) practiced non-beneficial cord care for their neonates. The respondents used various substances for umbilical cord care, majority 70 (26.6%) used hot fermentation, 44 (16.7%) Methylated spirit, 28 (10.6%) tooth paste, only 43(16.3%) used chlorhexidine.

**Conclusions:** There is high rate of use of harmful substances for cord care in our environment and should be discouraged through health education of the populace using the mass media and health talks in health facilities. The incidence of chlorhexidine use, which is the recommended antiseptic for cord care by WHO and federal Ministry of health was very low. High maternal level of education, social class and place of delivery are the determinants of beneficial cord care practice s in this study.

**Keywords:** Umbilical cord Care, Practices, Determinant, Mothers, Sokoto.

which call for ending preventable deaths of newborn babies and children younger than 5 years by 2030.<sup>6</sup> Although substantial progress has been made in reducing neonatal mortality since 1990, increased efforts to improve progress are still needed to achieve the Sustainable Development Goal (SDG) target of 12 per 1000 live birth.<sup>7</sup> About 130 million babies are delivered worldwide annually, with an estimated 4 million deaths occurring within the first 4 weeks of life and 1.5 millions of these deaths are attributable to infections.<sup>8</sup> Despite the progress made worldwide in newborn survival, the speed is still low in sub-Saharan Africa and South Asia, where the burden of neonatal death accounted for 27/1000 live births.<sup>7</sup> Africa accounts for more than 79% burden of the global neonatal death.<sup>6</sup> Neonatal mortality rate in Nigeria is 39 deaths per 1,000 live births,<sup>9</sup> the country was ranked 11th highest on newborn deaths in the world.<sup>10</sup> It is estimated that up to two thirds of new-born deaths can be prevented in countries such as Nigeria if known and effective health measures are provided at birth and during the first week of

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life.<sup>11</sup>

Care of the neonate's umbilical cord is crucial during the neonatal stage of life and poor umbilical cord practices have been linked with infections.<sup>12</sup> Cord infection may be localised to the umbilical cord (omphalitis) or enter into the blood stream and become systemic.<sup>13</sup> With standard care the cord usually falls off between five to fifteen days after birth.<sup>14</sup> Where clean cord care is not practiced, the cord is colonised and infected by pathogenic organisms.<sup>14,15</sup>

Several hospital-based studies in Nigeria, have reported that umbilical cord infection is responsible for 30% of neonatal deaths.<sup>16</sup> A review of umbilical infection in Ibadan showed that it accounts for 18% of neonatal deaths,<sup>15</sup> and 49% of neonatal deaths were due to umbilical cord infection.<sup>16</sup> Despite the efforts to improve umbilical cord care practices, guidelines for umbilical cord care are often not followed.<sup>17</sup> Even babies delivered in hospitals may be affected by traditional practices after discharge which most of the times lead to umbilical cord infection and death among the neonates.<sup>18</sup>

WHO recommends the use of Chlorhexidine for umbilical cord care for babies born at home and in health facilities, because women who deliver in a health facility may return home quickly (within 6 to 24 hours) to the same conditions in which a home birth would have taken place, thus exposing the newborn to the risk of infection via the freshly cut umbilical stump.<sup>19</sup> studies have shown that mothers apply substances such as hot fermentation, lantern wax, vaseline, ash, charcoal, groundnut oil, palm oil, soil powder, saliva, tooth paste, red sand,<sup>18</sup> shea butter, menthol containing balm, fish bone, traditional medicine<sup>20</sup> ash and cow dung.<sup>21</sup> These practices are more often very harmful as they are contaminated with bacteria and spores thus increasing the risk of umbilical infection and neonatal tetanus.<sup>22</sup> Clean, dry cord care is recommended for newborns born in health facilities and at home in low neonatal mortality settings, use of chlorhexidine in these situations may be considered only to replace the application of a harmful traditional substance, such as cow dung, to the cord stump.<sup>19</sup> The study aimed to determine the factors that influence umbilical cord care practices among mothers whose neonates were admitted into Special Care Baby Unit of Usmanu Danfodiyo University Teaching Hospital, Sokoto.

## MATERIAL AND METHODS

This study was carried out among mothers whose neonates were admitted into Special Care Baby Unit of Usmanu Danfodiyo University Teaching Hospital (UDUTH), Sokoto. The hospital is a tertiary health facility located in Sokoto, the Sokoto State capital, North western Nigeria. It serves as a referral centre for more than 10 million people from Sokoto, Zamfara, Niger, Katsina and Kebbi states of Nigeria and the neighbouring Niger and Benin Republics in the West African sub-region.

### Study design and duration of study

This was a cross-sectional study that aimed to determine the factors that influence umbilical cord care practices among

mothers whose neonates were admitted into Special Care Baby Unit of Usmanu Danfodiyo University Teaching Hospital, Sokoto, mothers were consecutively recruited until the desired sample size was achieved.

Conducted between 1<sup>st</sup> January to 30th June 2017.

### Study Population

This comprised of mothers with their neonates that were admitted into the Special Care Baby Unit of Usmanu Danfodiyo University Teaching Hospital, Sokoto.

### Sample Size Determination

The minimum sample size was determined using the formula.<sup>23</sup>

$$N = \frac{z^2 pq}{d^2}$$

Where N= desired sample size needed for meaningful statistical analysis

z = the standard normal deviate usually set at 1.96 which corresponds to 95% confidence interval, p = the proportion in the target population estimated to have a particular characteristic, in this study, p is the proportion of mothers with beneficial practice of umbilical cord care of 20.5% (0.205) from a previous similar study (Abhulimhen-Iyoha *et al.*<sup>24</sup> This gave a minimum sample size of 263 after addition of 5% attrition rate.

### Inclusion criteria

Mothers aged 15-50 years with their neonates that were admitted to the Special Care Baby Unit of Usmanu Danfodiyo University Teaching Hospital, Sokoto.

### Exclusion criteria

Neonates that were admitted into the Special Care Baby Unit of UDUTH, Sokoto from labour room or from the theatre after caesarean delivery, because cord care in the facility is with the use of chlorhexidine following delivery in the hospital labour room or caesarean delivery.

### Data collection procedure

A semi-structured interviewer administered questionnaire was used in this study, four research assistants were trained on the content and method of administration of questionnaire prior to the commencement of the study by the principal researcher. The research assistants obtained information on the age of mother, parity educational status of both parents, occupation of both parents, age and sex of the neonate, place of antenatal care and delivery, substances used for cord care before presenting to the Special Care Baby Unit of Usmanu Danfodiyo University Teaching Hospital, Sokoto.

The cord care by the mother was adjudged as beneficial when it was treated with chlorhexidine or methylated spirit, even though, chlorhexidine is the gold standard recommended by WHO and federal ministry of Health for umbilical cord care for babies, other forms of treatment to the umbilical cord stump were adjudged as non-beneficial, which included the use of hot compress, herbs, salt, saliva mixed with ash, menthol-containing balm, and toothpaste. Socioeconomic status was determined based on the method by Oyediji.<sup>25</sup> Studies<sup>3,13,20,21</sup> has shown that mothers use unapproved

substances for umbilical cord care. Thus, this study sought to determine the factors that influence umbilical cord care practices among mothers whose neonates were admitted into Special Care Baby Unit of Usmanu Danfodiyo University Teaching Hospital Sokoto.

**STATISTICAL ANALYSIS**

The data obtained was analysed using SPSS version 20. Sociodemographic characteristics of the mothers were expressed in frequency and percentages. Mean±SD was used to summary indices for mother’s age, parity and gender, frequency tables were used to present other variables such as place of last delivery and educational qualification. Chi square test was used to test for association between variables such as mothers age, educational attainment, social class, place of delivery and method of cord care practiced. probability value of less than 0.05 was considered statistically significant in this study

Ethical clearance was sought and obtained from Usmanu Dan fodio University Teaching Hospital, Sokoto ethics committee. Written and verbal informed consents were obtained from all the respondents with confidentiality assured and maintained.

**RESULTS**

Two hundred and sixty-three mother neonate pair were studied, the neonates were 123(46.8%) males and 140(53.2%) females, giving a male to female ratio of 0.9:1. The neonates age ranged 1-28 days, with a mean age of 9.30 ± 10.32. The mothers age ranged between 17 and 50 years, with a mean of 28.30 ± 6.40 years, majority of the mothers were in the age range 25-34 years, as shown in table 1.

Majority of the mothers (67.3%) practiced non-beneficial cord care. The respondents used various substances for umbilical cord care, majority 70(26.6%) used hot fermentation, 44(16.7%) Methylated spirit, 43(16.3%) used Chlorhexidine, 28(10.6%) tooth paste, alcohol 26(9.9%) and other substances (ash mixed with saliva, salt, herbs and powder) as depicted in figure1.

One hundred and sixty-four of the mothers had information on cord care, these was by their attending nurses at antenatal clinic in 58(22.1%), grandmothers 43(16.3%), media 23(9.7%) other health workers (CHEW, CHO) 23(9.7%), doctors 11(4.2%) and others as shown on table 2.

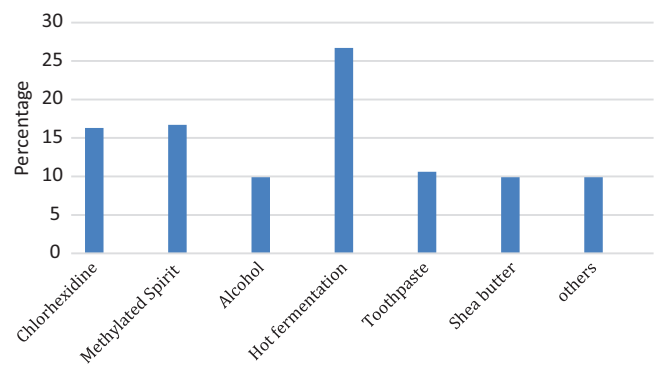
Beneficial and non-beneficial cord care practices were carried both among male and female neonates. sex is not a determinant of beneficial cord care practice (=0.274) (table 3). All the maternal age groups practiced more of non-beneficial cord care than beneficial (table 3), however, individuals practicing beneficial cord care were commonly the older age groups (25-34 years) (12.9%) in comparison with the middle age groups (45-50 years) (0.8%), no significant relationship exists between beneficial cord care practice and maternal age ( $\chi^2=1.588, F=1.709, P=0.653$ ), as shown on table 3.

The study group consisted 3 major tribes, namely Hausa 181(68.8%), Igbo 48(18.3%), and Yoruba 24(9.1%), other minor tribes of Nigeria constituted 10(3.8%) of the

respondents. No significant relationship exists between beneficial cord care practice and maternal tribe, ( $P=0.57$ ) see table 3.

Maternal parity ranged between one and nine, with modal parity been 3. Non-beneficial cord care practice was highest among the mothers with parity1- 4 (53.6%). No significant relationship exists between beneficial cord care practice and maternal parity, as shown, (table 3). Most 72(27.4%) of the surveyed women, had no formal education and 66 (25.1%), 69(26.2%) and 56 (21.3%) had primary, secondary and higher education as their highest educational attainment. The use of beneficial cord care practice increased with increasing maternal educational status. Maternal level of education is a determinant of beneficial cord care practice ( $P=0.0001$ ) (table 3).

One-twenty-one (46.0%) of the families belonged to the lower social class, 84(31.9%) to the middle class and 58(22.1%) to the upper socio-economic class. Non-beneficial cord care practice was highest among the low socio-economic class (36.1%). The relationship between non-beneficial cord care practice and socio-economic class of the families was statistically significant ( $p=0.001$ ) (table 3).



**Figure-1:** Bar chart showing substances applied to the umbilical stump by mothers

Mothers age group(years)	Frequency (%)
15-<25	94(35.7)
25-<35	113(43.0)
35-<45	50(19.0)
45-50	6(2.3)

**Table-1:** Age distribution of mothers

Information source	Frequency (%)
Nurse	58(22.1)
Media	23(8.7)
Grandmothers	43(16.3)
* Other health workers	23(8.7)
Doctors	11(4.2)
Neighbour	2(0.8)
TBA	4(1.3)
*CHEWS, CHO	

**Table-2:** Source of information to the mothers on cord care practiced

Variable	Beneficial cord care practice	Non- Beneficial cord care practice	X <sup>2</sup>	df	F	P value
Age group (years)						
15-<25	30 (11.4)	64 (24.3)	1.588	3	1.709	0.653
25-<35	34 (12.9)	79 (30.0)				
35-<45	20 (7.6)	30 (11.4)				
45-<50	2 (0.8)	4 (1.5)				
Tribe						
Hausa	66 (25.1)	115 (43.7)				
Igbo	11(4.2)	37 (14.1)	7.42	3	7.41	0.57
Yoruba	4 (1.5)	20 (7.6)				
Others	5 (1.9)	5 (1.9)				
Educational status						
None	13 (4.9)	59 (22.4)	22.55	3		0.0001
Primary	20 (7.6)	46 (17.5)				
Secondary	21 (8.0)	48 (18.3)				
Tertiary	32 (12.2)	24 (9.1)				
Socio-Economic class						
Upper	27 (10.3)	31 (11.8)	13.63	2		0.001
Middle	33 (12.5)	51 (19.4)				
Lower	26 (9.9)	95(36.1)				
Parity						
1-4	67(25.5)	141 (53.6)	0.108	1		0.423
5 and above	19 (7.2)	36 (13.7)				
ANC						
Yes	79(30.0)	91(34.6)	45.35	2		0.001
No	6 (2.3)	86(32.7)				
Place of delivery						
Government hospital	67(25.5)	94 (61.2)	21.87	2		0.001
Home	9(3.4)	68(25.9)				
Private	10(3.8)	15(5.7)				
Gender of Neonate						
Male	43(16.3)	80(30.4)	0.54	1		0.274
Female	43(16.3)	97 (36.9)				

**Table-3:** Determinant of umbilical cord care practiced among mothers

Majority 170(64.6%) of the mothers had antenatal care, while 93(35.4%) did not. Mothers that attended antenatal care practiced beneficial cord care 79(30.0%) more than mothers that did not have antenatal care 7(0.03%), there is statistically significant association between beneficial cord care practice and maternal antenatal care attendance ( $p=0.0001$ ). Over half 161(61.2%) of the respondents delivered in a Government hospital, 77(29.3%) and 25(9.5%) delivered at home and private hospitals respectively. Mothers that delivered in the Government Hospitals and private hospitals practiced cord care that are beneficial to their babies more than those that delivered at home. As shown on Table 3,  $p= (0.0001)$ .

## DISCUSSION

The study showed that majority of the mothers used hot fermentation followed by methylated spirit, only few (10.6%) used chlorhexidine gel for umbilical cord care for their neonates. This is in keeping with the finding of Udosen et al<sup>18</sup> in calabar where only few (22.8%) of the mothers used chlorhexidine for cord disinfection and by Mohammed et al<sup>26</sup> in plateau where only 6.9% of the mothers use chlorhexidine gel for cord care of their neonates. The use of chlorhexidine agrees with the WHO 2014 recommendation for developing

countries when harmful, unhygienic, traditional practices place newborns at increased risk for infection.<sup>19</sup> The finding that the cord care practices of majority of the respondents were not in line with the recommendation of the World Health Organization and the Federal Ministry of Health is very alarming, this is despite the Federal Ministry of Health, Nigeria published and rolled-out a 5 year National Strategy for Scale up of CHX gel for the care of umbilical cord in Nigeria in 2016.<sup>27</sup> Furthermore, Studies conducted in Nepal, Bangladesh and Pakistan have shown that cleansing the cord with Chlorhexidine (CHX) significantly reduces incidence of omphalitis and mortality in newborns.<sup>18</sup> The reason for few mothers using CHX and a greater percentage used methylated spirit may be due to its long cord separation time when compared to methylated spirit,<sup>26</sup> this may explain why majority of mothers use non-orthodox method of cord care. Methylated spirit was also widely used for cord care by mothers, this is agreement with the findings of Peace<sup>1</sup> in Yenogoa and Udosen et al in calabar<sup>18</sup> Other studies had documented the use of methylated spirit alone in 20.5% of mothers in Benin city Nigeria,<sup>28</sup> Ambe et al<sup>3</sup> reported 8.5% in Borno State, while Joel-Medewase et al<sup>22</sup> obtained 59.2% in Ibadan.



More than half of the respondents used varied and unhygienic materials for cord care, because they may be readily available or may have been influenced by customs or were unaware of the health risks involved,<sup>1</sup> in this study some mothers used toothpaste, hot compress, shea butter, alcohol and herbs and ash mixed with saliva on the umbilical cord of their neonate this is consistent with the findings where mothers used ash,<sup>18,26</sup> salt<sup>18,26</sup> and other substances for cord care, hot fermentation<sup>18,20</sup> and toothpaste<sup>1,26</sup> these practices are mostly linked to age long traditional practices transferred through generations which may be difficult change.<sup>26</sup>

Majority of the mothers (67.3%) practiced non beneficial cord care, this is commensurate with studies done in Benin City of Nigeria,<sup>28</sup> Yenogowa, Bayelsa State<sup>1</sup> and Borno state<sup>3</sup> where the majority of the respondents (79.5%), (62.4%) and (91.5%) respectively had poor practice of umbilical cord care, which is in contrast to the studies done in Kano State,<sup>30</sup> Nigeria and Oshogbo, Osun State,<sup>22</sup> which documented ((60.9%) and (82.0%) respectively which reported good practice of cord care among mothers. the reason for poor cord care practices in our respondents when compared to other studies may be attributed to the fact that majority were from lower socio-economic class and with no formal education and the hospital been a referral centre patient with their mothers present from not only sokoto metropolis but all over the state and neighbouring states such as Kebbi and Zamfara states.

In this study, nurses were the highest source of information on cord care. This is in consonance with findings in Yenogowa, Bayelsa State,<sup>1</sup> Benin<sup>28</sup> and Calabar.<sup>18</sup> This is probably because in most antenatal clinics in our settings, nurses routinely give health talks, some of which may include teachings on cord care. Grandmothers featured next to nurses as sources of information, this agrees with the finding of other authors.<sup>1</sup> In Nigeria and most African societies, grandmothers are regarded as custodians of wisdom and are often responsible for passing on tradition including newborn and child care practices, nformation passed may be good, outdated or potentially dangerous.<sup>1</sup>

The study revealed that there is no association between gender of the child and practice of beneficial cord care practice, this is in contrast to finding of Abbulimhen-Iyoha et al in Benin, Nigeria<sup>28</sup> where more male infants were treated with beneficial cord care than the female infants, probably because of the preference of the male child over the female one in this part of the world.<sup>1</sup> The socio-demographic characteristics of the mothers (higher educational attainment, older age, higher socio-economic class) practiced the WHO and nationally approved care of umbilical cord in this study, similar findings were documented in Benin City Nigeria where the practices of healthy cord care was seen to increase with increasing maternal education.<sup>26,28</sup> The use of beneficial cord care practice increased with increasing maternal education. These findings are in keeping with studies that show that the higher the level of maternal education, the better the health seeking behaviour and thus exposure to better knowledge of child care practices.<sup>1,18,26</sup> This is further reinforcing the

importance of female education in ideal healthcare seeking attitude. This reiterates the need for women of reproductive age to be educated because the financial capacity to acquire proper aseptic substances for cord care also influences the substances used.<sup>26</sup> However, the association with social class and beneficial cord care practice found in this study is contrast with findings in other studies<sup>1,28</sup> but agrees with the finding of some authors<sup>1,26</sup> Some authors postulated that increasing social development predisposes mothers to transit to modernistic newborn practices which are perceived to be safe, while others report that increasing social class does not necessarily mean increase in family income and so may not influence health practices.<sup>1</sup>

Most of the mothers delivered in the hospitals (Government and private clinics) delivering in hospitals in this study is associated with practice of beneficial cord stump care practices. This is in consonance with what was found by Joel-Medewase et al.<sup>22</sup> and Ambe et al.<sup>3</sup> which show that mothers who deliver in recognised health facilities are more likely to practice better cord care, the use of harmful agents was more common among mothers that delivered in the non-orthodox place of deliveries like at home attended to by a traditional birth attendant, this is in comparison with what was found by Udosen,<sup>18</sup> Ambe et al<sup>3</sup> and Joel-Medewase et al,<sup>22</sup> where the use of harmful agents was more common among mothers of babies delivered in the traditional birth attendants' place. This has brought to light the importance of culture as a driver of practice of cord care and its underestimated subtle contributions to neonatal morbidity and mortality particularly in resource poor countries.

## CONCLUSION

There is high rate of use of harmful substances for cord care in our environment and should be discouraged through health education of the populace using the mass media and health talks in health facilities. The incidence of chlorhexidine use, which is the recommended antiseptic for cord care by WHO and federal Ministry of health was very low. High maternal level of education, social class and place of delivery are the determinants of beneficial cord care practice s in this study. The grandmothers play an important role in new born care and should be a target group for health education to improve new born care practices in our environment. Female education and empowerment which has long been designated as one of the child survival strategy and also highlighted in this study as a determinant of healthy cord care practices is needed to promote this low cost and highly effective practices amongst mothers.

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