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Original Research Article

Determinants of cord care practices among caregivers in a level 5 facility in Kenya

Penina Muia Mulwa[1], Ruth Gathoni Mbugua[2]*, Jane Karonjo[3]

[1]ReaMedica Healthcare Limited, Nairobi, Kenya
[2]Mama Ngina University, Gatundu, Kenya
[3]Mount Kenya University, Thika, Kenya

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***Correspondence:**
Dr. Ruth Gathoni Mbugua,
E-mail: rmbugua15@gmail.com

ABSTRACT

Background: Globally, in the year 2020, 2.4 million children died with the likelihood of a child in Sub-Saharan Africa to die in their first month after birth being ten times higher compared to that in developed countries. Infection is a leading cause of mortality among infants with a significant number being attributed to umbilical cord infections. The aim of the study was to assess cord care practices and the associated factors among mothers and care givers at the Mombasa County referral hospital in Kenya.
Methods: This was a facility-based descriptive cross-sectional study conducted in the maternal child health/family planning clinic at a level 5 public health facility in Mombasa County, Kenya. Systematic random sampling was employed to select study respondents. Quantitative data was analyzed using SPSS version 21. The association of the dependent and independent variables was assessed using Pearson Chi-square statistics. A $p<0.05$ was considered significant at 95% CI.
Results: Slightly below half (43.6%) of the respondents had practiced inappropriate cord care. Inappropriate cord care practices reported included the use of breast milk (24.3%), herbal substances (17.8%), warm salty water (16.4%), saliva (15.1%), soot (11.2%), black soil (7.9%) and coconut oil (7.2%). Socio-cultural beliefs regarding cord care were prevalent among the respondents. Socio-demographic characteristics, facility-related factors, and socio-cultural factors were associated with cord care practices ($p<0.05$).
Conclusions: There is a need to enhance health education regarding cord care among women in the health facilities and community. Strategies to enhance scale- up of chlorhexidine use should be explored.

Keywords: Cord care practices, Omphalitis, Umbilical, Neonatal sepsis

INTRODUCTION

Globally, in the year 2020, 2.4 million children died with Sub-Saharan Africa reporting the highest mortality rates. The likelihood of a child in sub-Saharan Africa to die in their first month after birth is ten times higher compared to developed countries. Neonatal sepsis is the 3rd leading cause of neonatal mortality globally.[1] Neonatal sepsis may stem from omphalitis which may lead to systemic infections. This is may be attributed to contamination of the umbilical cord stump.[2] While omphalitis is not limited to particular settings, it is more prevalent in low and middle-income countries where there is a high number of home deliveries that occur unattended by a skilled birth attendant in unsterile settings.[3] The umbilicus can be a source of infection in the first days of life after delivery based on the cord care practices.[4]

Evidence across countries in developing countries shows the use of various harmful substances for cord care which

include; cow dung, ash, mud, saliva, rat faeces, turmeric, oil, and butter to quicken healing of the stump.[2,5,6] Perceived beliefs revolving around the application of this substance include to promote healing, moisturize the cord, to prevent pain, and to remove evil spirits from the infant.[5] When inappropriate cord care practices are adopted, omphalitis results. The WHO recommends the application of 4% chlorhexidine to the umbilical stump among new-borns delivered at home in high- risk settings and a clean dry cord amongst infants born in health facilities and low risk settings.[3] Efforts to avoid cord infection through advocating for "dry cord care" and the use of chlorhexidine to stop the use of harmful substances on the umbilical stump have not always resulted in the intended outcomes. Application of harmful substances remains a major challenge that increases the risk for omphalitis.

In Kenya, the policy guidelines emphasized on dry cord care until 2013, however, the use of alcohol-based antiseptics as routine care among health facilities has been reported.[7] The current guidelines recommend the use of chlorhexidine as part of umbilical cord care to prevent infections.[8] However, despite this recommendation, the level of implementation has been slow. The changes in cord care guidelines requires training of health care workers across all levels of health care delivery. Insufficient training has contributed to non-standardized practices across health facilities in Kenya. A preference for the routine use of methylated spirits among health care providers has been documented. Inconsistencies in the implementation of cord care across facilities have been witnessed with the low acceptance of chlorhexidine being associated with lack of training, stock outs, lack of clear guidelines on use and prohibitive retail prices.[9]

Neonatal sepsis attributed to omphalitis continues to affect a significant number of infants in Kenya.[8] According to Kenya demographic health survey, 2022 neonatal deaths account for 66% of infant deaths and 51% of under-5 deaths.[10] Despite the rolling out of new guidelines on cord care, diverse practices are practiced across various facilities and communities that include the use of harmful substances. This study seeks to establish cord care practices and associated factors among caregivers at Mombasa County referral hospital.

METHODS

Study area

The study was conducted at the Mombasa County Referral Hospital which is a level 5 hospital in the coastal region of Kenya. The hospital serves clients from the entire Mombasa County. The study was conducted at the maternal child health and family planning clinic which provides immunization services, family planning service, postnatal care, growth monitoring and nutrition services.

Study design

A descriptive hospital-based cross-sectional study was adopted which aimed at establishing the cord care practices and the associated factors. Quantitative methods of data collection were applied using a pretested interviewer administered questionnaire.

Study population

The study population included all mothers and caregivers of infants aged 0-6 weeks attending MCH/FP clinic at the Mombasa County referral hospital at the period of the study.

Inclusion criteria

Mothers and care givers aged 18 years and above with infants aged 0-6 weeks visiting the MCH/FP clinic were included in the study.

Exclusion criteria

Mothers or care givers with very sick babies or were not residents of Mombasa County were excluded from the study.

Sample size determination

A sample size of 342 respondents was calculated from the total number of 3,120 using Yamane's formula for a population below 10,000. To cater for the attrition rate, 10% of the respondents was added to make the desired sample size of 376.

Sampling techniques

Systematic random sampling technique was used to sample mothers and caregivers attending MCH/FP clinic at the Mombasa-county referral hospital. Every 8th client attending the MCH/ FP who met the inclusion criteria was selected to participate in the study.

Data collection

A structured interviewer administered questionnaire was used in the study. A pre-test was conducted at Port Reiz hospital. To ensure reliability, research assistants were identified and trained prior to data collection to minimize interview bias. The data was collected between February to June 2019.

Data analysis

Data collected was entered, coded, cleaned, and analyzed using SPSS version 21.0. The relationship between the dependent and independent variables was determined using Chi-square. A $p<0.005$ was considered significant at 95% CI. The results were presented through graphs, percentages, charts, and frequency tables.

Ethical considerations

The researcher sought for ethical clearance from the coast general hospital research and ethics review committee (Ref ERC-CGH/MSc/VOL.1/51). Permission to carry out the study was sought from the national commission of science, technology and innovation (NACOSTI). The researcher sought further authorization from Mombasa-county referral hospital research committee before data collection. During the study, informed consent was sought from study participants while confidentiality and anonymity was ensured throughout the study period. Participation was voluntary and no incentives were given to the study participants.

RESULTS

Socio-demographic characteristics

The response rate in the study was 92.8% which constituted a total of 349 respondents. Of the total 349 respondents, 334 (95.7%) were mothers of the child while 15 (4.3%) were guardians/ caregivers. Majority 156 (44.7%) of respondents were aged 28-37 years. Majority 236 (67.6%) of the respondents were married while (21.8%) who were single. Regarding the respondents' religion, more than half 201 (57.6%) were Muslims.

Concerning the highest level of education attained, 134 (38.4%) had attained secondary level education. Regarding occupational status, 149 (42.7%) of the respondents were self-employed. Regarding the monthly family income of the respondents, slightly above a third, 119 (34.1%) earned Kshs. 10,001- Kshs. 20,000. Slightly above the third 124 (35.5%) of the respondents had two children (Table 1).

Cord care practices

Cord care practices were categorized into appropriate and inappropriate. Of the total respondents in the study, more than half, 197 (56.4%) had practiced appropriate cord care while 152 (43.6%) had adopted inappropriate cord care practices. Of the 197 who practiced appropriate cord care, a majority 94 (47.7%) kept the cord dry, 62 (31.5%) swabbed with spirit and 41 (20.8%) used chlorhexidine gel (Figure 1).

Of the 152 respondents who practiced in-appropriate cord care; 37(24.3%) applied breast milk, 27 (17.8%) used herbal substances, 25 (16.4%) applied warm salty water, 23 (15.1%) applied saliva, 17 (11.2) applied soot, 12 (7.9) applied black soil and 11(7.2) applied coconut oil. When probed on what they would do in case of signs of infection on the umbilicus, 216 (61.9%) of the respondents reported that they would seek medical care services, 111 (31.8%) would seek services from traditional healers and 22 (6.3%) reported that they did not know what to do.

Factors associated with cord care practices

Socio-demographic characteristics

In the study, socio-demographic characteristics were associated with cord care practices. Age of the respondents was significantly associated with cord care practice ($\chi2$=16.678 df=3, p=0.001). Marital status was significantly associated with the cord care practice ($\chi2$=10.485 df=2, p=0.004). There was a statistically significant association between highest level of education attained and cord care practice ($\chi2$=12.018 df=3, p=0.007). The parity of the respondents was significantly associated with cord care practices among the respondents ($\chi2$=23.699 df=3 p=0.013). In the study, religion, occupation, and monthly income were not associated with cord care practices (Table 2).

Results showed that majority 238 (71.3%) of the respondents had attended antenatal care (ANC) while 96 (28.7%) had not attended ANC during pregnancy. More than half 126 (52.9%) of the respondents who had attended ANC were taught on cord care practice while the rest 112 (47.1%) were not taught. Majority 233 (69.8%) of the respondents had delivered at the health facility while 79 (23.7%) had delivered at home. More than half 130 (55.8%) of the respondents who had delivered at the health facility had not been provided with any items for cord care while the rest 103 (44.2%) had been provided (Table 3).

Regarding the items provided, majority, 62 (60.2%) had been provided with alcohol swabs while 41 (39.8%) were provided with chlorhexidine gel. Regarding the adequacy of the information provided, Most, 215 (64.4%) of the respondents reported having adequate information on cord care while the rest 119 (35.6%) felt that it was inadequate. Regarding follow- up on cord care practice before 6 weeks, a majority, 208 (59.6%) of respondents were not followed up on cord care before 6 weeks after delivery (Table 3).

In the study, facility-related factors were associated with cord care practices. Attendance to ante natal clinic (ANC) was significantly associated with cord care practice (p=0.013). The receiving of health education on cord care during ANC was significantly associated with cord care practice (p=0.001). Provision items for cord care by the hospital was associated with cord care practice (p=0.004) (Table 4).

Socio-cultural factors

Socio-cultural beliefs related to cord care were reported in the study. Regarding who should make the choice of the cord care practice, only 27.5% believed it was a health care provider. Notably, 90 (25.8%) believed they should make the choice, 67 (19.2%) the mother-in-law, while 59 (16.9%) believed that it was the traditional birth attendant. A majority (68.2%) held the belief that there

was a difference in cord care depending on the baby's gender.

An interesting finding was that 112 (32.1 %) of the respondents believed that the application of the father's urine promoted faster healing of the cord. Slightly below half (44.7%) of the respondents perceived the cord as a delicate part of the infant that causes tension and anxiety. Other beliefs reported included the separation of the mother and father and keeping the baby away from visitors before the cord heals. Socio-cultural beliefs were significantly associated with cord care practices. The community belief of who should guide on cord care practice was significantly associated with the cord care practice (p=0.001). The belief that the baby should be kept away from visitors was significantly associated with cord care practice (p=0.002). The belief that the cord is a delicate organ that causes tension and anxiety before falling was significantly associated with cord care practice (p=0.001) (Table 5).

Table 1: Socio-demographic characteristics.

Variables	Category	N	Percentage (%)
Age (in years)	18-27	97	27.8
	28-37	156	44.7
	38-47	67	19.2
	≥ 48	29	8.3
Marital status	Single	76	21.8
	Married	236	67.6
	Divorced/widowed/separated	37	10.6
Religion	Muslim	201	57.6
	Christian	126	36.1
	Others	22	6.3
Highest level of education	No formal education	44	12.6
	Primary completed	104	29.8
	Secondary completed	134	38.4
	Tertiary completed	67	19.2
Occupation	Not employed	112	32.1
	Self-employed	149	42.7
	Employed	88	25.2
Average monthly family income (KShs)	≤10,000	83	23.8
	10,001-20,000	119	34.1
	20,001-30,000	51	14.6
	30,001-40,000	59	16.9
	>40,000	37	10.6
Parity	One	82	23.5
	Two	124	35.5
	Three	91	26.1
	≥ Four	52	14.9
Relationship to the child	Mother	334	95.7
	Caregiver	15	4.3

Table 2: Socio-demographic characteristics associated with cord care practices.

Independent variables	Category	Cord care practices		P value
		Appropriate, (n=197) (%)	Inappropriate, (n=197) (%)	
Age (In years)	18-27	79 (40.1)	18 (11.8)	0.001
	28-37	81 (41.1)	75 (49.3)	
	38-47	27 (13.7)	40 (26.3)	
	≥ 48	10 (5.1)	19 (12.5)	
Marital status	Single	29 (14.7)	47 (30.9)	0.004
	Married	153 (77.7)	83 (54.6)	
	Divorced/separated /widowed	15 (7.6)	22 (14.5)	
Religion	Muslim	109 (55.3)	92 (60.5)	0.501
	Christian	77 (39.1)	49 (32.2)	
	Others	11 (5.6)	11 (7.2)	

Continued.

Independent variables	Category	Cord care practices		P value
		Appropriate, (n=197) (%)	Inappropriate, (n=197) (%)	
Highest level of education	No formal education	17 (8.6)	27 (17.8)	0.007
	Primary completed	35 (17.8)	69 (45.4)	
	Secondary completed	99 (50.3)	35 (23)	
	Tertiary completed	46 (23.4)	21 (13.8)	
Occupation	Not employed	79 (40.1)	33 (21.7)	0.079
	Self-employed	81 (41.1)	68 (44.7)	
	Employed	37 (18.8)	51 (33.6)	
Monthly family income (Kshs)	≤ 10,000	49 (24.9)	34 (22.4)	0.061
	10,001-20,000	57 (28.9)	62 (40.8)	
	20,001-30,000	38 (19.3)	13 (8.6)	
	30,001-40,000	34 (17.3)	25 (16.4)	
	> 40,000	19 (9.6)	18 (11.8)	
Number of children	One	63 (32)	19 (12.5)	0.013
	Two	87 (44.2)	37 (24.3)	
	Three	22 (11.2)	69 (45.4)	
	≥Four	25 (12.7)	27 (17.8)	
Relationship to the child	Parent (mother)	191 (97)	143 (94.1)	0.804
	Guardian	6 (3)	9 (5.9)	

Table 3: Facility related factors.

Independent variables	Category	N	Percentage (%)
Attendance of ANC	Yes	238	71.3
	No	96	28.7
	Total (N)	334	100
Taught on cord care practice during ANC	Yes	126	52.9
	No	112	47.1
	Total (N)	238	100
Place of delivery	Health facility	233	69.8
	Home	79	23.7
	On the way	22	6.6
	Total (N)	334	100
Provided items for cord care by hospital after delivery	Yes	103	44.2
	No	130	55.8
	Total (N)	233	100
Items provided for cord care	Chlorhexidine gel	41	39.8
	Methylated Spirit swab	62	60.2
	Total (N)	103	100
Provision of adequate information on cord care	Yes	215	64.4
	No	119	35.6
	Total (N)	334	100
Follow-up on cord care practice before 6 weeks	Yes	141	40.4
	No	208	59.6
	Total (N)	349	100

Table 4: Association of facility related factors and cord care practices.

Independent variables	Category	Cord care practices, n (%)		Chi-square
		Appropriate	Inappropriate	
Attendance of ANC	Yes	143 (75.7)	95 (65.5)	0.013
	No	46 (24.3)	50 (34.5)	
	Total	189	145	
Taught on cord care practices	Yes	84 (63.2)	42 (40)	0.001
	No	49 (36.8)	63 (60)	
	Total	133	105	

Continued.

Independent variables	Category	Cord care practices, n (%)		Chi-square
		Appropriate	Inappropriate	
Place of delivery	Health facility	119 (63)	114 (78.6)	0.055
	Home	56 (29.6)	23 (15.9)	
	On the way	14 (7.4)	8 (5.5)	
	Total	189	145	
Provided items for cord care by the hospital	Yes	59 (43.4)	44 (45.4)	0.004
	No	77 (56.6)	53 (54.6)	
	Total	136	97	
Items given for cord care	Chlorhexidine gel	28 (39.4)	13 (40.6)	0.583
	Spirit/alcohol swab	43 (60.6)	19 (59.4)	
	Total	71	32	
Provided adequate information on cord care	Yes	131 (69.3)	84 (57.9)	0.018
	No	58 (30.7)	61 (42.1)	
	Total (N)	189	145	
Follow-up on cord care before 6 weeks	Yes	76 (38.6)	65 (42.8)	0.103
	No	121 (61.4)	87 (57.2)	
	Total (N)	197	152	

Table 5: Socio-cultural factors associated with cord care practices.

Independent variables	Category	Cord care practices		P value
		Appropriate, (n=197) (%)	Inappropriate, (n=152) (%)	
Cord care given by the mother after delivery is influenced by	Health provider	72 (36.5)	24 (15.8)	0.001
	Mother-in-law	42 (21.3)	25 (16.4)	
	Self	46 (23.4)	44 (28.9)	
	TBA	23 (11.7)	36 (23.7)	
	Others	14 (7.1)	23 (15.1)	
Cord care differs based on the baby's gender	Yes	125 (63.5)	113 (74.3)	0.215
	No	72 (36.5)	39 (25.7)	
Applying baby's father urine fastens cord healing	Yes	49 (24.9)	63 (41.4)	0.151
	No	103 (52.3)	46 (30.3)	
	Don't know	45 (22.8)	43 (28.3)	
The mother should stay away from the father until the cord heals	Yes	119 (60.4)	56 (36.8)	0.011
	No	35 (17.8)	42 (27.7)	
	Don't know	43 (21.8)	54 (35.5)	
The baby should be kept away from visitors	Yes	105 (53.3)	83 (54.6)	0.002
	No	92 (46.7)	69 (45.4)	
The cord is a delicate organ, causing tension and anxiety before falling	Yes	125 (63.5)	31 (20.4)	0.001
	No	72 (36.5)	121 (79.6)	

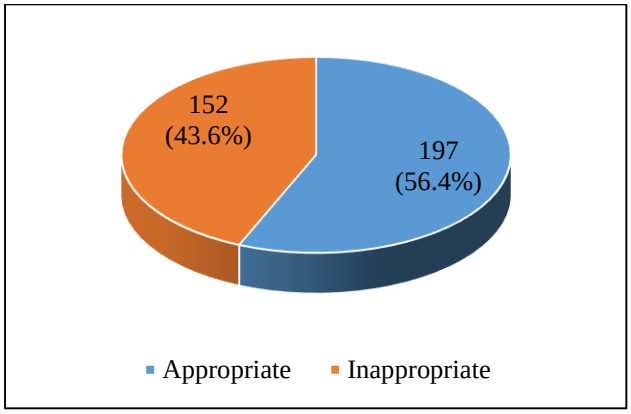

Figure 1: Cord care practices among study participants.

DISCUSSION

The study findings indicated that a significant proportion of the respondents had applied in appropriate cord care practice. The application of substances like saliva, herbal substances, breast milk, soot, black soil, and salty water are not unique to Kenya. Similar findings have been reported in other low and middle-income countries. A systematic review of practices across low and middle-income counties in Sub-Saharan Africa reported similar findings.[5] The use of harmful substances for cord care has similarly been reported in studies conducted in Nigeria and Ethiopia.[11-13] The use of inappropriate substances reported in the current study increases the risk of umbilical cord infection among neonates as the substances are unsterile. A study conducted in Kenya

associated the use of harmful substances with omphalitis.[6] The use of harmful substances has been associated with misconceptions of faster healing and cultural beliefs.[5] Overcoming such negative beliefs requires a concerted effort among key players in the health sector. Health education of mothers and advocacy in the community are paramount.

Evidence has shown the effectiveness of chlorhexidine in the prevention of omphalitis in comparison to dry cord or use of alcohol swabs.[14,15] Interestingly, despite the implementation of guidelines on the use of chlorhexidine for cord care in Kenya, in line with the WHO recommendations, only 20.8% of the respondents reported the use.[3,8] A significant number of the respondents in the study were provided with alcohol swabs from the health facility or were advised to practice dry cord care. This denotes the urgent need for harmonization of cord care practices across the health facilities in Kenya and the need for sensitization of all health care workers to the use of chlorhexidine. In the study, more than half of the respondents had not been provided with the substances used in cord care, which may lead to the use of other harmful substances. Strategies to scale up the use of chlorhexidine and follow-up on cord care practices during the postnatal period should be urgently considered.

In the study, deficits in knowledge regarding cord care were evident. Notably, a significant number of respondents reported that in case of infection of the cord, they would seek traditional healers while others did not know what action they were required to take. Additionally, more than half of the respondents practiced inappropriate cord care practices despite delivering in a health facility. This is an indication, of inadequate, knowledge on the relevance of appropriate cord care practices. This finding provides important learning moments to health care providers on the need for health education among mothers. There is a need to teach mothers adequately on cord care to enhance appropriate cord care.

The study findings indicated that socio-demographic characteristics influenced the cord care practices. Similar findings were reported in a study conducted in Ghana and in Ethiopia.[16,17] Similar findings have been reported in a study done in Uganda among an urban population.[18] Similarly, a study conducted in Tanzania reported the association of cord care practices with the level of education, occupation, and parity.[19] The level of education is likely to influence a woman's choice of cord care practice due to the knowledge they acquire in comparison to those with low levels of education who may rely on existing cultural beliefs. Multi-parous women have experience regarding cord care and therefore first-time mothers may require proper guidance and information to avoid them tapping in to existing myths and misconceptions.

Cultural beliefs related to cord care were reported in the study and were associated with inappropriate cord care. Similarly, beliefs on cord care were prevalent in a community -based study in India.[20] A population-based study conducted in Zambia found diverse cultural beliefs and practices regarding cord care.[21] A systematic review in low and middle -income countries similarly reported the influence of senior community members like traditional birth attendants or mother in laws on cord care.[22] Socio-cultural beliefs systems continue to provide alternative sources of information and influence cord care practices in communities. Similarly, a study conducted in Kenya found that cultural beliefs and taboos were barriers to the implementation of chlorhexidine use for cord care.[23] In the African context, diverse cultural beliefs exist regarding cord care practices. Strategies to overcome negative beliefs especially in culturally endowed communities like Kenya, regarding cord care should be explored.

Infant mortality can be reduced in low resource settings by eliminating deaths attributed to preventable causes like omphalitis among neonates. Enhancing the implementation of appropriate cord care practices among neonates is key. The concerted effort of all key players is paramount. The scaling up of the use of chlorhexidine should be urgently considered. Advocacy of appropriate cord care practices should be reinforced at the facility and community level to overcome negative cultural beliefs hindering appropriate cord care practices.

This study is not without limitations, it was a cross-sectional study therefore, the association of dependent and independent variables could not be clearly explained. The study was conducted in the coastal region of Kenya, and hence, further research should be done among women and care givers in other communities as cultural practices may vary. Nonetheless, random selection of participants was adopted and the region being cosmopolitan this ensured equal representation of the study subjects. The study provides very vital information to the key players in the prevention of omphalitis.

CONCLUSION

Sub-optimal cord care practices were noted among the respondents. The use of harmful substances for cord care was prevalent in this population. Socio-demographic factors, facility factors, and socio-cultural factors were associated with cord care practices. The prevention of omphalitis through integration of health education on cord care during ANC and training of health care workers on the current guidelines on cord care should be urgently considered. Advocacy on appropriate cord care in the community should be considered to overcome harmful cultural practices in the community.

Recommendations

There is a need to enhance health education among women during the antenatal and postnatal period and inclusion of cord care to essential new born care. Sensitization of all health care providers to the current cord care guidelines is paramount. Health education to overcome the negative beliefs hindering implementation of chlorhexidine use.

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