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Assessment of knowledge and practices on cord care among postnatal mothers attending public health facilities in Morogoro municipality

Suzan Mdegela[1], Anne Outwater[2], Mathew David Ndomondo[3,*]

[1]*Morogoro Referral Regional Hospital, P.O Box 110, Morogoro, Tanzania.*
[2]*Muhimbili University of Health and Allied Sciences, School of Nursing, P.O Box 65001, Dar-es-Salaam, Tanzania.*
[3]*Hubert Kiruki Memorial University, 70 Chwaku Street, Regent Estate, Mkocheni, P.O Box 65300, Dar es Salaam, Tanzania.*

Abstract

Background: The lives of newborns depend on the mother's knowledge of health care and practices about cord care. It is because the cord stump is the major means of entry for infections after birth. Clean cord care practices help to prevent infections and hence reduce neonatal morbidity and mortality. In this study, we assessed knowledge and practices on cord care among postnatal mothers attending public health facilities in Morogoro municipal.

Methods: It was a cross-sectional study that used a quantitative approach that involved 251 postnatal mothers attending a postnatal clinic during the study time. Data were analyzed using Statistical Package for Social Sciences software version 21.0. Both descriptive and inferential analyses were done whereby logistic regression and the chi-square test to determine the association between dependent and independent variables.

Results: Out of 251 postnatal mothers (95.2%) got information about postnatal checkups at the health facility. Also, 132(52.6%) had adequate knowledge and 47(4%) had inadequate knowledge. The majority (85.7%) stated that the cord stump should be handled with a clean dressing/cover and 80.1% of them reported that the cord stump should not be wet/soiled. Of all factors assessed only education level showed a significant relationship with the knowledge of cord care; the higher the education level, the higher the knowledge of cord care. Mothers who at least attended primary, secondary or higher education more often had adequate knowledge about cord care as compared to mothers with no formal education**.**

Conclusion: The level of knowledge among the study participants about cord care was moderately satisfactory. This study identified that level of education was an independent predictor of their level of knowledge about cord care. Mentorship session for nurses and midwives about postnatal care services is hence needed and also mothers need competency-based training from nurses and midwives about cord care.

Keywords: Knowledge, Practice, Cord care, Cord stamp, postnatal mothers, public health facilities.

Background

The first week of life is very critical because most neonatal deaths occur at this age. Most of these neonatal deaths occur due to unacceptable health care practices, unhygienic practices, taboos, and superstitions associated with cord care that contribute to neonatal cord infection (Efa BW et al., 2020). Newborn health and survival depend on the precaution given to newborn care and are a significant component in reducing child mortality. The lives of newborns send on mothers' knowledge of health care and practices especially cord care. Global estimates show that about 7,000 neonatal deaths occur every day in the first week of life and 2.5 million children die in the first month of life (Structures MB et al., 2015).

In most African countries including Tanzania, most postnatal mothers lack regular attendance to health facilities (Mohan D et al., 2015) this result in low knowledge of good cord care practices (Mildred E et al., 2015). Good cord care practices include; cutting the umbilical cord with a sterile playing

* *Corresponding author, Mathew David Ndomondo: mathew.ndomondo@hkmu.ac.tz*

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tie with sterile materials, don't apply any substance on the cord, and keeping the cord stump clean and dry. The cord stump will dry and shrink if exposed to air without any dressing, binding, or bandages (Efa BW et al., 2020). It remains clean when it is protected with clean clothes and should be kept away from contamination such as urine and feces soiling. Local practices of putting various substances on the cord stump whether in health facilities or homes should be carefully examined and discouraged. Poor or unhygienic cord-cutting and tying practices have been identified as risk factors for neonatal infection (J. Kayombo E et al 2013).

The National Bureau of Statistics of Tanzania estimates that 25 neonates die out of 1000 live birth each year and the neonatal mortality rate in the Morogoro region is estimated to be 8.3/1000 live births. (TDHS 201-16). However, about 75% of newborn deaths could be avoided simply by the use of sterile blades for the umbilical cord and the use of clean drapes for wrapping the baby to avoid umbilical cord infections and allow maintain the newborn hygiene (Nigatu SG et al., 2015). With these alarming rates of neonatal deaths newborn cord, care has been identified as a proven intervention that saves newborn lives (Osuchukwu NP et al., 2019).

Material and Methods

Study design

This was a descriptive cross-sectional study where data was collected at one point in time from postnatal mothers at Mafiga and Nunge health facilities.

Setting

The study was conducted at Morogoro municipal which is among seven administrative districts in the Morogoro region. The study involved two public health facilities Mafiga and Nunge out of five public health facilities. These two were purposively selected based on a high number of clients attending the clinic.

Study participants and sampling procedures

The study population involved postnatal mothers within 42 days post-delivery who attended Mafiga and Nunge postnatal clinics during the data collection process. A total of 251 postnatal mothers were recruited from postnatal clinics by using a simple random sampling method. Participants selected a piece of paper inside. Those who selected pieces of paper written YES were included in the study and those who selected NO were not included in the study. The sampling process continued until the required sample size was reached.

Data collection instruments

The study used a semi-structured questionnaire with both open and closed questions on the demographic information, knowledge of cord care, and practice of cord care. The questionnaire was prepared in Kiswahili the language that is spoken by the majority for easy understanding. After consenting and knowing the study intention, mothers were asked to fill in the questionnaires with assistance from research assistants.

Data processing and analysis

Data that was generated from the respondents was daily checked and cleared to ensure the quality and consistency of data. Also, all questionnaires were coded by numbers to maintain the anonymity of participants. Data analysis was conducted using Statistical Package for Social Sciences (SPSS) version 21. The analysis involved descriptive statistics to describe the sample population and relevant proportions, in the frequency table and cross-tabulations between independent and dependent variables. A scoring system was used to analyze responses to closed-ended questions on knowledge: 1 = Correct response (consistent with WHO essential newborn care guidelines); 0 = Incorrect response

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(inconsistent with WHO essential newborn care guidelines). Any mother who did not know the answer was considered to have an incorrect response.

The responses to the open-ended questions were summarized and inferential statistics was carried out whereby the chi-square test was calculated to show the association between study variables. Continuous variables were represented by mean and standard deviations and categorical data by whole numbers and percentages. We did logistic regression to determine factors associated with knowledge of cord care. A p-value of ≤ 0.05 was considered statistically significant.

Results

Social demographic characteristics of study participants

A total of 251 participants were recruited for this study. Their ages ranged from 13 to 44 years with a median age of 27 years (IQR 23-30 years). Most participants 152(60.6%) belonged to the age group 20-29 years old. The majority 202(80.1%) of respondents were married; 128(51.0%) had primary education and 88(35.1%) had secondary education. The majority3 (33.1%) had two children (Table 1)

Table 1. Socio-demographic characteristics of study participants (n=251).

Variables	Frequency	Percent
Age (years)		
10-19	**22**	**8.8**
20-29	**152**	**60.6**
30-39	**75**	**29.8**
40+	**2**	**0.8**
Median age (Interquartile range (IQR))	**27 (23-30)**	
Marital status		
Single	40	15.9
Married	201	80.1
Separated	8	3.2
Widow	2	0.8
Level of education		
No formal education	17	6.8
Primary	128	51.0
Secondary	88	35.1
Higher education	18	7.1
Occupation		
Employed	22	8.8
Self-employed	50	19.9
Businesswoman	50	19.9
Peasant	49	19.5
Housewife	80	31.9
Parity		
1	61	24.3
2	83	33.1
3	55	21.9
≥ 4	52	20.7

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Relationship between knowledge of mothers on postnatal care and their responses on how often a mother should go for a postnatal checkup.

There is a strong relationship between knowledge of mothers on how often a mother should attend the clinic for a postnatal checkup and general knowledge of mothers on postnatal care. Generally, a total of 132(52.6%) mothers had adequate knowledge (Table 2).

Table 2: Relationship between knowledge of postnatal care and their responses on how often they should go for a postnatal checkup (n=251)

Responses of mothers on how often they should go for postnatal checkups	Knowledge of mothers on cord care	
	Adequate (n)	Inadequate(n)
Once	18(69.2)	8(30.8)
Twice	23(60.5)	15(39.5)
3 times	27(73.0)	10(27.0)
4 times	20(58.8)	14(41.2)
Don't know	53(45.7)	63(54.3)
Total	**132(52.6)**	**119(47.4)**

Source of information on the postnatal checkup

Almost 95.2% of postnatal mothers who participated in the study reported that they got information about a postnatal checkup from a health facility; 2.0% from social media, 0.8% from Church/Mosque, and 1.2% from colleagues as shown in Figure 1 below.

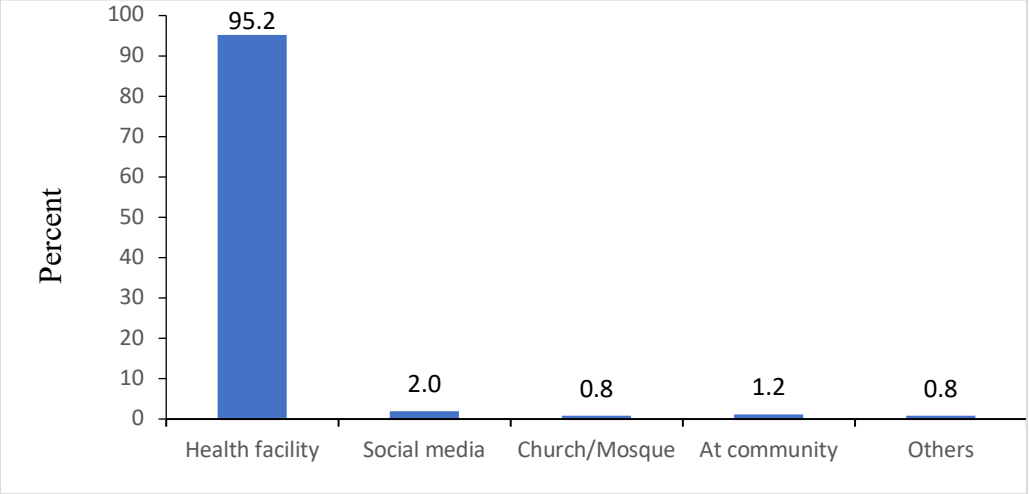

Figure 1: Response of mothers regarding the source of information on the postnatal checkups

Mothers' knowledge of danger signs to the newborn related to cord care would alert them to seek medical advice

Table 3 below indicates that more than half of 162(64.5%) of postnatal mothers knew that high temperature is one of the danger signs to newborn babies that would make them seek medical advice,

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followed by bleeding from the cord stump 144(57.4%) and 6(2.4%) of the respondents said they don't know when they should seek for medical advice.

Table 3: Mothers' knowledge about when to seek medical advice for issues related to cord care (n=251)

When to seek medical advice	Frequency	Percent
Heavy crying	39	15.5
High temperature	162	64.5
Bleeding of the cord	144	57.4
Don't know	6	2.4

Note. *The number and percent do not add up to 251 and 100% as this was a multiple-response question*

How should cord stump be handled after cutting and how should it be kept

The findings show that the majority 215(85.7%) of postnatal mothers stated cord stump should be handled with a clean dressing/cover and 201(80.1%) of them reported that the cord stump should not be wet/soiled as detailed in table 4 below:

Table 4: Response of mothers on how to handle cord stump (n=251)

Variables	Frequency	Percent
Handling of cord stump after cutting		
With clean dressing/cover	215	85.6
Without dressing	11	4.4
Don't know	25	10.0
The cord stump should be wet/soiled		
Yes	8	3.2
No	201	80.1
Don't know	42	16.7

Association between social-demographic characteristics and knowledge of cord care

All mothers recruited were asked five questions related to cord care to judge their knowledge about cord care. The questions were rated and those who answered 4 questions and or above correctly were regarded as having adequate knowledge and those who answered below 4 questions correctly were regarded as having inadequate knowledge. Out of all postnatal mothers who were recruited 132(52.6%) had adequate knowledge and 119(47.4%) had inadequate knowledge.

We did logistic regression to assess socio-demographic factors associated with knowledge of mothers on cord care. Of all factors assessed education level and several parities showed a significant relationship with knowledge on cord care while others were not statistically significant. Mothers who at least attended primary and secondary education were three times more likely to have adequate knowledge of cord care compared to those with no formal education OR 3.19(95%CI 1.06-9.57) p-value=0.04 and 3.16(95%CI 1.02-9.73) p-value=0.05 respectively. Likewise, those with higher education had even higher odds of adequate knowledge on cord care six times compared to those with no formal education OR 6.24(95%CI 1.44-27.06) p-value=0.01. Women who had given birth to four or more children were 3 times more likely to have adequate knowledge of cord care as compared to women

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who had given birth to a single child OR 3.11(95%CI 1.42-6.81) p-value 0.01. For more details see table 5 below:

Table 5. Association between socio-demographic characteristics and knowledge on cord care among postnatal mothers (n=251)

Variable	Cord care Adequate knowledge (%)	Inadequate knowledge (%)	Odds ratio (95% CI)	P-value
Total	**132(52.6) (95%CI: 49.8%-62.4%)**	**119 (47.4)**		
Age (years)				
10-19	11(50.0)	11(50.0)	Ref	
20-29	77(50.7)	75(49.3)	1.03(0.42-2.51)	0.95
30-39	44(58.7)	31(41.3)	1.42(0.55-3.68)	0.47
40+	1(50.0)	1(50.0)	1.0(0.06-18.08)	1.00
Marital status				
Single	19(47.5)	21(52.5)	Ref	
Married	116(57.7)	85(42.3)	1.51(0.73-2.98)	0.24
Separated	5(62.5)	3(37.5)	1.84(0.39-8.77)	0.44
Widow	1(50.0)	1(50.0)	1.11(0.06-18.93)	0.95
Education level				
No formal education	5(29.4)	12(70.6)	Ref	
Primary	73(57.0)	55(42.10)	3.19(1.06-9.57)	0.04
Secondary	50(56.8)	38(43.2)	3.16(1.02-9.73)	0.05
Higher education	13(72.2)	5(27.8)	6.24(1.44-27.06)	0.01
Occupation				
Employed	15(68.2)	7(31.8)	Ref	
Self-employed	29(58.0)	21(42.0)	0.64(0.22-1.86)	0.42
Businesswoman	24(48.0)	26(52.0)	0.43(0.15-1.24)	0.12
Peasant	28(57.1)	21(42.9)	0.62(0.22-1.80)	0.38
Housewife	45(56.3)	35(4.8)	0.60(0.22-1.63)	0.32
Number of parities				
1	27(44.3)	34(55.7)	Ref	
2	38(45.8)	45(54.2)	1.06(0.55-2.07)	0.86
3	31(56.4)	24(43.6)	1.63(0.78-3.39)	0.19
≥4	37(71.2)	15(28.8)	3.11(1.42-6.81)	0.01

Practices of postnatal mothers on cord care

Participants were asked if they applied anything to the baby's cord stump. The majority (88.1%) of postnatal mothers said that they did not apply any material to the cord stump while (11.9%) said they applied something to the cord stump. See figure 2 below:

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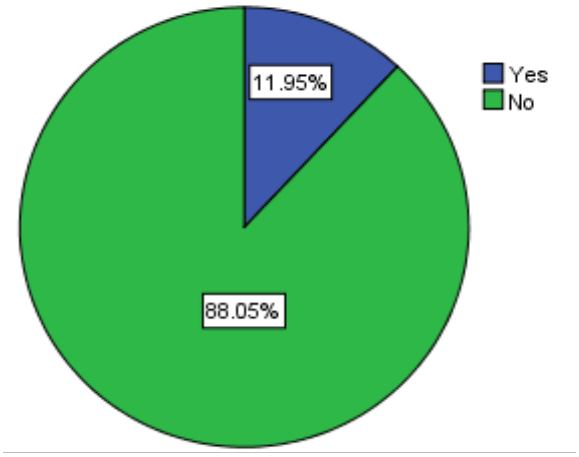

Figure 2: Responses of postnatal mothers on substances applied on baby's cord stump.

Substances applied on cord stump

Of the 11.9% of postnatal mothers who reported that they were applying some materials on cord stump, 33.3% of them were applying spirit, 24.2% coconut oil, 40.0% baby powder with ingredients of blended talc and fragrance, 26.7% cow dung while others (0.1%) applied medicines from the pharmacy and so on. For more detail see Table 6 below:

Table 6: Response of mothers to substances applied to baby's cord stump (n=30)

Item	Frequency	Percent	Percent of all babies
Things applied on cord stump			
Spirit	10	33.3	4.0
Coconut oil	7	24.2	2.8
Talc Powder	12	40.0	4.8
Cow dung	8	26.7	3.2
Others	3	0.1	1.2

Note: *The number and percent do not add up to 30 and 100% as this was a multiple-response question*

Practices on the care of cord stump and proper place for medical advice when cord stump bleeds

The majority (76.5%) of postnatal mothers who participated in the study reported keeping the cord stump dry and clean all the time and (98.4%) of them reported that, when the cord stump bleeds, they will be going to a health facility for medical advice. On the frequency of cord cleaning, 155(45.8%) of postnatal mothers stated that they don't know the frequency of cord cleaning and 60.2% of them stated that they don't know how to clean the cord. For more detail see Table 7 below:

Table 7: Response of respondents on practice related to cord care (n=251)

Question and responses	Frequency	Percent
What did you do when the cord stump bleeds or have unpleasant discharge		
Go to the health facility	247	98.4

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Home medication	3	1.2
Wait until it heals by itself	1	0.4
What do you do to keep the cord clean and safe*		
Reporting of cord bleeding	72	28.7
Keeping it dry and clean	192	76.5
What is the frequency of cord cleaning		
Once-daily	38	15.1
Morning, afternoon, evening	53	21.2
After each nappy is changed	45	17.9
Don't know	115	45.8
How to clean the cord		
Clean cord base before cord stump	19	7.5
Clean cord stump only	5	2.0
Clean surrounding skin only	53	21.1
Clean the material used to tie the cord	23	9.2
Don't know	151	60.2

***Note:** *The number and percent do not add up to 251 and 100% respectively as this was a multiple-response question.*

Discussion

In this study, the results show that mothers with adequate knowledge about cord care were 52.6% (95%CI: 49.8%, 62.4%). Mothers who are married, separated, and widowed were 51%, 84%, and 11% respectively more likely to have adequate knowledge of cord care compared to single mothers. The reason for this difference may be that majority of married women and those with at least have had a child may have prior experience of issues related to cord care than those who are single.

We also noticed that level of education and parity were significant association with knowledge of cord care among post-natal women. Women who attended primary school and secondary school were three times more likely to have adequate knowledge of cord care compared to those with no formal education. Also, those who attended higher education were even having higher odds of adequate knowledge by six times compared to those with no formal education. Similar findings were reported in Ghana by Nutor and others in 2016 that higher education was more associated with best practices of cord care (Osuchukwu NP et al., 2019). The reason for this difference may be due to most educated women adhering to what they have been taught in both antenatal, and postnatal clinics and learning from other sources than those with no formal education. Women who had given birth to four or more children were 3 times more likely to have adequate knowledge of cord care as compared to women with had given birth to a single child OR 3.11(95%CI 1.42-6.81) p-value 0.01.

In this study age, marital status, occupation, and parity of the mother were not significantly associated with knowledge about cord care. This is contrary to studies done in Kenya by Amolo and others in 2017 and Ethiopia by Behre and others in 2017 (Nutor JJ et al. 2016 and Tutor JJ et al., 2016). The reason for this difference may be due to the case that health care providers deliver or do not deliver correct health information or counseling about cord care regardless of age, parity, and occupation of the mother.

We also noticed that postnatal mothers generally knew that cord stump should be handled with care and should always be kept dry and clean. This was observed in 80.1% of mothers among all who responded to the question on how the cord stump should be handled. Similarly to this, the study done in Ethiopia reported that cord stump should be kept dry and clean as reported by (59.0%) of the

participants (Efa BW et al., 2020). The reason was that dry cord care quickens umbilical cord separation.

In this study also about 82.1% of women knew neonatal danger signs that would alert immediate postnatal care and or seeking medical advice. Of those women who participated 64.5% knew that they would seek medical advice if the child had a high temperature and 57.4% once they see bleeding from the cord. There were few mothers (2.4%) who said they don't know what would alert them to seek medical service on issues related to cord care. The reason for this may be due to not adhering to attending antenatal care visits to some women where they can be taught about all issues related to newborn care before delivery. These findings agree with findings from the study done in Ethiopia where more than 79.8% of participants mentioned at least one key danger sign (Mersha A et al., 2017).

This study indicated that almost (95.2%) of postnatal mothers who participated got information about postnatal checkups at the health facility, 2.0% through media and 1.2% heard about it from the community. Having information about postnatal check-ups has a greater impact on a mother's knowledge of cord care. As most women said they got information about postnatal check-ups at the health facility this calls for improved health education given to these women by the health care workers. Also, this calls for recognizing the importance of community health education where the majority can be met and brought to attention about all issues related to maternal and child health. Furthermore, none of the postnatal mothers reported that they got information from the traditional birth attendants. The findings are similar to the study done in Nigeria whereby the commonest source of information on cord care as nurses, as reported by (44.8%) of the participants during health talks at the antenatal clinic (Mersha A et al, 2012).

We also noticed that 46.2% of women do not know how often they should attend the postnatal clinic for a check-up. Results also concluded that there's strong evidence to suggest a real association between knowing how often she should go for a postnatal check-up and knowledge about cord care. Those who said that you should at least attend three to four times for a postnatal check-up had more adequate knowledge of cord care compared to those who said something else.

Study limitation

The limitation of this study was that the study population was recruited from a limited geographical area and therefore, the results cannot be generalized to other regions in Tanzania. However, these findings may represent other contexts with similar socio-economic characteristics. Also, the study findings are not in the position to show cause and effect relationships because the study design was cross-sectional.

Conclusion

This study revealed that mothers' level of knowledge about cord care is moderate though more effort is needed to provide awareness to mothers on the importance of the information provided at health care facilities which are effective and evidence-based interventions. Also, on part of practice, respondents do not know the frequency of cord cleaning and how to clean the cord. It is, therefore opined that this study will provide the foundation for further studies to structuring appropriate interventions to address some of the unbeneficial cord care practices. In general, this study identified that level of education and parity was an independent predictor of a mother's knowledge about cord care. Based on the above findings, we would like to provide the following recommendations

Ethical consideration: This study was approved by MUHAS ethical committee; certificate No. DA.287/298/01A.

Competing interests: The authors declare that they have no competing interests in the study.

Author's contributions: SM conceived, designed, and conducted the study. SM and MN analyzed the data and wrote the manuscript. AO supervised the whole study process. All authors read and approved the final manuscript.
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