

Knowledge and practice of umbilical cord care among young mothers of neonates in Tabora region

Analytical cross-sectional study

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Abstract

Knowledge of cord care influences the choice of cord care practices and has a great impact on neonate health. Poor cord care can lead to infection of the umbilical cord and thus have a bearing on the subsequent growth trajectory of the newborn. A health facility-based analytical cross-sectional study was carried out from January–March 2021 among 315 randomly selected young mothers aged 15 to 25 years with neonates aged between 7 and 28 days. An interviewer-administered structured questionnaire was used to collect data, and a chi-square test and a binary logistic regression model were used during data analysis. The level of significance was set at 5%. More than half of young mothers 196 (62.2%) had adequate knowledge of cord care, although practice of umbilical cord care was exceptionally poor, as only 21% of them had good cord care practice. Predictors of low knowledge were living in rural areas (adjusted odds ratio (AOR) = 2.54, $P = .012$), having no formal education (AOR = 15.4, $P = .038$), and delivering at home (AOR = 0.21, $P = .001$). While the predictors of poor umbilical cord care practices were having no formal education (AOR = 12.15, $P = .001$), having primary education (AOR = 7.8, $P = .003$), being a peasant (AOR = 6.6, $P = .001$), business woman (AOR = 3.6, $P = .035$), housewife (AOR = 4.2, $P = .014$) and prime para (AOR = 0.49, $P = .004$). Living in urban areas, having a higher education level, and having delivered in a health facility were important factors in having knowledge on cord care, while having a higher education level, being employed, and being a multipara were important factors in maintaining cord in a healthy state.

Abbreviations: AOR = adjusted odds ratio, ANC = antenatal care, WHO = World Health Organization

Keywords: Knowledge, neonates, practice, Tabora, Tanzania, umbilical cord care, young mothers

1. Introduction

The neonatal period is the most vulnerable time for a child's survival, where neonates face highest risk of dying in their first month of life. Globally, 2.4 million children die in the first month of life, which accounts for 47% of all child deaths under the age of 5 years. Sub-Saharan Africa had the highest neonatal mortality rate accounting for 27 deaths per 1000 live births.^[1]

Umbilical cord care is among the essential newborn care practices recommended by the World Health Organization (WHO) to reduce neonatal morbidity and mortality. The basic principle of umbilical cord care is to keep it clean and dry, as this provides the fastest and safest umbilical cord healing.^[2]

Umbilical cord care is very important during the early post-natal period where the harmful cord care practices may directly contribute to infection in the newborn. The prevalence of cord infection in newborns ranges from 3 to 5% in most developing

countries.^[3] Unhygienic cord care practice has been implicated as the main factor responsible for the incidence of umbilical cord infection and inappropriate cord handling is among the risk factors.^[4]

The umbilical stump is a portal of entry for microorganisms into the bloodstream, as a focus of infection can be influenced by the frequency of application of harmful substances. These substances include cow dung, saliva, toothpaste, ash, saliva, and herbs, which increase the chances of sepsis and jaundice in the neonate period, thereby increasing morbidity and mortality.^[5]

Young mothers' knowledge and practice have a significant impact on the health of the neonate, with mothers who are knowledgeable about standard cord care being more likely to practice good cord care.^[6]

In the study done in Nigeria showed that, maternal level of education, occupation and parity were significant determinants of the care given to the umbilical cord care.^[7] while good

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knowledge of umbilical cord care was strongly associated with the increasing age, higher education, and marital status.^[8] The study conducted in Tanzania reported that good knowledge of umbilical cord care was determined by having higher level of education and having 3 and more children.^[9] Therefore, a clear understanding of the predictors of knowledge and cord care practices among young mothers will be helpful in designing intervention to improve young mothers' knowledge and hence their practice on umbilical cord care.

2. Methods

2.1. Study design and setting

This was a hospital-based analytical cross-sectional study conducted in the Tabora region in Tanzania. The study was conducted in reproductive and child health clinics within district hospitals and health centers. There are 4 district hospitals and 8 health centers in Tabora. According to the 2012 national census, the region has a population of 2,291,623, with an average growth rate of 2.9% annually.^[10] The proportion of teenagers who have given birth or ever been pregnant in the Tabora region is 43%.^[11]

2.2. Study population, sample size, and sampling procedure

The study population was all young mothers of neonates aged 15 to 25 years. The inclusion criteria were having a neonate aged 7 to 28 days attending a reproductive and child health clinic. The study excluded young mothers with neonates who were seriously ill during and those who refused to participate.

The sample size for this study was determined using the formula for a cross-sectional study,^[12] which is $n = Z^2P(1-P)/e^2$, where: n = minimum sample size, Z score value = 1.96 for 95% confidence level, P = the proportion of mothers with good cord care practice, which is 33% (0.33) from a previous study.^[13] The estimated sample size was 339 young mothers. Four district hospitals from 4 districts were all involved in the study, and simple random sampling by lottery method was used to select 6 health centers out of 8 from the 4 districts. Young mothers who attended reproductive health clinics within the selected district and health centers and met the inclusion criteria were selected using simple random sampling.

2.3. Variable measurement

Umbilical cord care practices: This was measured by 13 items of standard cord care practice on a ratio scale. Two points were awarded for the correctly mentioned carried out act and 0 points for not carried out act. The total score was 26, and respondents who scored above 50% of the total score were considered as having good umbilical cord care practices while those who scored below 50% were considered as having poor umbilical cord care practices.

Knowledge of umbilical cord care: Knowledge regarding umbilical cord care and neonatal sepsis was assessed using 13 items in multiple choice questions and measured on a ratio scale. One point was awarded for a correct response and 0 for any incorrect response. The total score was 13 points, and respondents who scored more than 50% of the total score were considered as having high knowledge score, and those who scored below 50% were considered as having low knowledge score.

2.4. Data collection procedure and data collection tool

Data were collected by the principal investigator and 3 research assistants who were nurses by profession in January 2021 for a

period of 4 weeks. Data were collected using an interviewer-administered structured questionnaire with close-ended questions. The standardized structured questionnaire was adopted and modified from the previous studies.^[6,14] The questionnaire had 3 parts: Part I consists of background information like age, place of residence, occupation, education, antenatal care (ANC) visits and parity. Part II consists of knowledge-based questions^[14] and Part III consists of questions on umbilical cord care practices^[6].

2.5. Data analysis

The statistical Package for social science (SPSS) Software Version 20 was used for data analysis. The data was checked for accuracy and completeness before the analysis. Descriptive statistics were used in the analysis of background information and items of measuring knowledge and practice and results were presented using frequency and percentages. A Chi-square test was used to measure the relationship between knowledge and practice, with background information. A binary logistic regression model was employed to identify the predictors of knowledge and umbilical cord care practice, and the odds ratio was reported. The level of confidence was set at 95% and a P -value of < 0.05 was considered significant.

2.6. Ethical consideration

Written informed consent was obtained from all participants after being given full information about the purpose and objectives of the study, and all completed questionnaires were kept confidential. This research was reviewed and approved by the institutional review board of the University of Dodoma-Tanzania with an Institute Ethical Committee (IEC) number (MA.84/261/02/215). All study procedures were conducted in accordance with the Declaration of Helsinki of the World Medical Association.

3. Results

3.1. Socio demographic characteristics of young mothers

This study was comprised of 315 young mothers. Findings showed that most young mothers were within 20 to 25 years of age 315 (71.4%), with an average mean age of 20.79 (SD = 2.74) years. The majority were married 237 (75.2%), half of them 158 (50.2%) were prime-para and 220 (69.5%) were from urban areas. Only 113 (35.9%) attended an antenatal clinic according to focused antenatal clinic standards, and 282 (89.5%) delivered at the health care facility. More information can be found in Table 1.

3.2. Awareness and knowledge on umbilical cord care

The majority of participants, 314 (99.7%), were aware of umbilical cord care, and 196 (62.2%) learned about it from their mother/mother-in-law, who are the primary caregivers during the postnatal period. When it came to umbilical cord care knowledge, 137 (43.5%) knew the importance of cord care is to prevent infection, a majority 237 (75.2%) knew that cord clamps are the safe materials used to tie a cord, and 298 (94.6%) knew that it takes 5 to 15 days for the cord to detach, while only 121 (38.4%) knew that nothing should be applied to the cord during cleaning. Moreover, 161 (51.1%) knew the cause that can lead to cord infection is when unhygienic materials are placed on cord, while 46 (14.6%) reported on placing the baby completely in water when giving the baby a bath. Only 42 (13.3%) mentioned redness at the umbilical site as a sign of infection, and 170 (54.0%) mentioned foul smelling as a sign of infection.

Table 1
Sociodemographic characteristics of young mothers (N = 315).

Variable	Frequency	%
Age of mothers (yr)		
15–19	90	28.6
20–25	225	71.4
Residence		
Rural	95	30.2
Urban	220	69.8
Marital status		
Single	49	15.6
Married	237	75.2
Cohabiting	29	9.2
Level of education		
No formal education	42	13.3
Primary education	174	55.2
Secondary education	85	27
Higher education	14	4.4
Occupation		
Peasants	143	45.4
Business	87	27.6
Housewife	66	21.0
Employed	19	6.0
Parity		
Primepara	158	50.2
Multipara	157	49.8
ANC visits		
Not attended	4	1.3
1 visit	17	5.4
2 visits	127	40.3
3 visits	98	31.3
4 visits>	69	21.9
Place of delivery		
Healthy facility	282	89.5
Home	33	10.5

ANC = antenatal care, AOR = adjusted odds ratio.

The overall knowledge score revealed that a slight majority of 196 (62.2%) had a higher cord care knowledge score (Table 2).

3.3. Relationship between knowledge on cord care and demographic characteristics

Some of the studied variables have shown a significant relationship with knowledge. The proportion of participants with high knowledge score was significantly higher among those who lived in urban areas (n = 149 (67.7%) vs rural 47 (49.5%), χ^2 : 9.375, $P = .002$), with higher education level (n = 13 (92.9%), vs having no formal education 17 (40.5%): fisher test: 22.584, $P < .001$), who were employed (n = 16 (84.2%), vs peasant 76 (53.1%), fisher test: 13.752, $P = .003$), who attended 3 ANC visits (n = 75 (76.5%) vs not attended any 2 (50%), fisher test: 14.129, $P = .007$), and among those who delivered their child at health facility (n = 189 (67.0%) vs home delivery 7(21,2%), χ^2 : 26.290, $P < .001$). Other variables did not show a significant relationship with knowledge (Table 3).

3.4. Predictors of knowledge of umbilical cord care among young mothers

Simple and multiple regression models were used to determine the predictors of low knowledge scores among young mothers. Results of simple regression model showed that living in the rural areas, having no formal education, and having home delivery were significantly associated with low knowledge scores on cord care. According to the results of a multiple regression model, young mothers who lived in rural areas were 2.54 times

Table 2
Awareness and knowledge on umbilical cord care (N = 315).

Variable	Frequency	%
Awareness about the cord care		
Are you aware about the umbilical cord care		
Yes	314	99.7
No	1	0.3
Source of Information		
Health care provider	65	20.6
Friends	29	9.3
TBA	23	7.6
Mother/mother in law	196	62.2
Who is taking care of you during post-natal period?		
Biological mother	189	60
Mother in-law	56	17.8
Husband	18	5.7
Sister	40	12.7
Sister in-law	12	3.8
Knowledge on cord care		
What is the importance of cord care? (to prevent infection)	137	43.5
What is the safe material used to tie the cord? (cord clamp)	237	75.2
How long does it take for the umbilical cord to detach? (5–15 d)	298	94.6
What should be applied to the cord during cleaning? (nothing should be applied)	121	38.4
Should the cord be exposed after cleaning?		
Yes	139	44.1
No	176	55.9
What are the causes of umbilical cord infection?		
When umbilical stump is moist	123	39.0
When bathing a baby completely in water	46	14.6
When unhygienic materials placed on cord	161	51.1
What are the signs of umbilical cord infection?		
Redness at the umbilical site	42	13.3
Foul smelling	170	54.0
Yellowish discharge from cord	168	53.3

more likely to have a low knowledge score on umbilical cord care [AOR = 2.54 at 95% CI = 0.444–1.336, ($P = .012$)] than those who lived in urban areas; and those who had no formal education were 15.4 times more likely to have a low knowledge score on cord care [AOR = 15.4 at 95% CI = 1.164–205.73] Moreover, young mothers who had delivered at home were less likely to have low knowledge score on cord care by 79% (AOR = 0.21 at 95%CI = 0.086–0.540, $P = .001$) compared to those who had delivered at a health facility (Table 4).

3.5. Practice of umbilical cord care

When assessing practice on umbilical cord care, the majority 275 (87.3%) reported cleaning the umbilical cord but only 41 (13.0%) reported cleaning once daily as recommended. About half 154 (48.9%) washed their hands with water and soap before and after cleaning of the umbilical cord, 151 (47.9%) reported cleaning the cord base before cleaning the surrounding skin, and only 25 (7.9%) reported not applying anything to the umbilical cord in order to facilitate healing. The majority

Table 3
Relationship between knowledge on cord care and demographic characteristics (N = 315).

Variable	Knowledge score level		χ^2	Fisher exact test	P-value
	High score	Low score			
	n (%)	n (%)			
Age of mothers			1.649		.199
15–19	51 (56.7)	39 (43.3)			
20–25	145 (64.4)	80 (35.6)			
Residence			9.375		.002
Urban	149 (67.7)	71 (32.3)			
Rural	47 (49.5)	48 (50.5)			
Marital Status			1.41		.49
Single	30 (61.2)	19 (38.8)			
Married	145 (61.2)	92 (38.8)			
Cohabiting	21 (72.4)	8 (27.6)			
Level of education				23.045	<.001
No formal Education	17 (40.5)	25 (59.5)			
Primary Education	101 (58.0)	73 (42.0)			
Secondary Education	65 (76.5)	20 (23.5)			
Higher Education	13 (92.9)	1 (7.1)			
Occupation				13.803	.003
Peasant	76 (53.1)	67 (46.9)			
Business	64 (73.6)	23 (26.4)			
House wife	40 (60.6)	26 (39.4)			
Employed	16 (84.2)	3 (15.8)			
Parity			0.733		.392
Prime para	102 (64.6)	56 (35.4)			
Multipara	94 (59.9)	63 (40.1)			
ANC visits				14.81	.004
1 visit	9 (52.9)	8 (47.1)			
2 visits	67 (52.8)	60 (47.2)			
3 visits	75 (76.5)	23 (23.5)			
4 > visits	43 (62.3)	26 (37.7)			
Not attended	2 (50.0)	2 (50.0)			
Place of delivery			26.290		<.001
Health Facility	189 (67.0)	93 (33.0)			
Home	7 (21.2)	26 (78.8)			

ANC = antenatal care.

Table 4
Predictors of low knowledge score on cord care among young mothers (N = 315).

Variable	OR	95%CI		P value	AOR	95%CI		P Value
		Lower	Upper			Lower	Upper	
Age of mothers								
15–19	1				1			
20–25	1.386	0.842	2.281	.199	0.77	0.444	1.33	.353
Residence								
Urban	1				1			
Rural	2.143	1.311	3.504	.002	2.54	1.233	5.25	.012
Education level								
No formal	19.11	2.28	160.10	.007	15.4	1.164	205.73	.038
Primary education	9.39	1.202	73.43	.033	9.8	0.798	122.58	.233
Secondary education	4.0	0.492	32.495	.195	4.8	0.46	56.239	.208
Higher education	1							
ANC visits								
Not Attended	1.86	0.444	7.852	.394	1.23	0.266	7.759	.787
1 visit	1.15	0.453	2.964	.759	1.16	0.432	3.147	.761
2 visits	0.41	0.155	1.107	.079	0.48	0.172	1.366	.171
3 visits	0.81	0.305	2.198	.691	1.04	0.365	2.975	.938
4>	1							
Place of delivery								
Health facility	1				1			
Home	0.13	0.055	0.316	<.001	0.21	0.086	0.540	.001

ANC = antenatal care, AOR = adjusted odds ratio.

of 300 (95.2%) reported bathing their newborn prior to cord detachment, while only 140 (44.4%) sponge bathed. The overall practice score showed that only 66 (21%) had good cord care practice (Table 5).

3.6. Relationship between cord care practices and demographic characteristics

Some of the studied variables have shown significant relationships with cord care practices. The proportion of participants who practiced good cord care was significantly higher among those with a higher education level ($n = 11$ (78.6%) vs no formal education ($n = 10$ (23.8%), Fisher test: 28.997, $P = .001$), those who were employed ($n = 14$ (73.7%) vs peasant $n = 43$ (30.1%), $2: 13.140$, $P = .001$), and those who were primipara ($n = 78$ (49.4%) vs multipara $n = 50$ (31.8%), $\chi^2: 9.989$, $P = .002$). Other variables did not show a significant relationship with cord care practice (Table 6).

3.7. Predictors of poor practices of umbilical cord care among young mothers

Results of a simple regression model showed that having no formal education, having a primary education level, being a primipara and being a peasant were significantly associated with having poor cord care practice. In a multiple regression model, results showed that young mothers who had no formal education were 12.15 times more likely to have poor cord care practice [AOR = 12.15 at 95% CI = 2.757–53.561, ($P = .001$)] compared to those with a higher education level. And those who had primary education level were 7.8 times more likely to have poor cord care practice [AOR = 7.8 at 95% CI = 2.020–28.041, $P = .003$] compared to those with higher education level. Furthermore, peasants were 6.6 times more likely to have poor cord care practices [AOR = 6.6 at 95% CI = 2.186–20.009, ($P = .001$)], business owners were 3.61 times more likely to have poor cord care practices [AOR = 3.61 at 95% CI = 1.086–10.339], and housewives were 4.29 times more likely to have poor cord care practices [AOR = 4.29 at 95% CI = 1.343–13.732, ($P = .014$)] compared to those who were employed. And those young mothers who were prime para were less likely to have poor cord care practice by 51% [AOR = 0.49 at 95% CI = 0.303–0.793, ($P = .004$)] compared to those who were multipara (Table 7).

4. Discussion

The findings of this study showed that the slight majority of young mothers (62.2%) demonstrated higher knowledge of cord care. Similar to the studies conducted in Nigeria, which showed that 74.4%^[15] and 73.8%^[16] of mothers had adequate knowledge of umbilical cord care. However, according to a study conducted in Calabar, only 40.2 percent of mothers have adequate knowledge on cord care.^[6] The difference could be attributed to different in characteristics of study population and settings.

According to the findings of this study, mothers' education level is an important factor in having a high level of knowledge about cord care. Those with no formal education had a higher odd of having low knowledge. This is expected as those with no formal education are less likely to have the ability to read, and those who have a higher education level could get the information on cord care from brochures or stamps or wall boards in the healthcare facilities. This finding is similar to the study conducted in Ethiopia, which also showed that those who had tertiary education had 2.46 times higher odds of having high knowledge than those who had no formal education.^[17]

In this study, young mothers who delivered at home had lower odds of having higher knowledge compared to those

who delivered at a healthcare facility. This is due to the fact that those who deliver at a healthcare facility have the opportunity to get information on cord care from health care providers during postnatal teaching. This is similar to the findings of Chizoma et al, in Nigeria, which showed that most women who gave birth with the help of skilled providers received information on umbilical cord care in the health facilities.^[18]

Place of residence has also shown a significant association with knowledge of cord care in this study. Those who live in rural areas have higher odds of having low knowledge compared to those who live in urban areas. This could be explained by the fact that those who live in urban have easy access to health-care facilities and thus more sources of health information. This finding is consistent with the findings of a study conducted in Abakaliki, which found that urban dwellers knew more about cord care than those from rural areas.^[14]

This study found that the majority of mothers with newborns had poor cord care practice, which was consistent with findings from other studies conducted in Uganda and Ghana, where the majority of mothers had poor cord care practice or unsafe cord care.^[19,20] Contrary findings were obtained from other studies, where more than half of mothers had good cord care practice.^[16,21] Moreover, the study found that the education level, of mothers had strong association with umbilical cord practice. Mothers who have no formal education and who have primary level of education have higher odds of having poor cord care practices than those who have a higher education level. This could be due to the fact that a highly educated mother could have a better understanding or awareness of cord care practices, thus giving these mothers the ability to take care of

Table 5

Practice of umbilical cord care among young mothers of neonates (N = 315).

Variable	Yes n (%)	No n (%)
Cleaning practice		
Do you clean the umbilical cord?	275 (87.3)	40 (12.6)
How frequent do you clean the umbilical cord? (once per day)	41 (13.0)	274 (86.9)
Do you wash hands before and after cleaning of the umbilical cord?	289 (91.7)	26 (8.2)
Do you wash hands with water only?	135 (42.9)	180 (57.1)
Do you wash hands with water and soap?	154 (48.9)	161 (51.1)
How do you clean the cord? (cleaning the cord base first)	151 (47.9)	164 (52.0)
Do you apply anything to the cord?	298 (94.6)	17 (5.4)
What substances do you apply after cleaning the cord to facilitate healing?		
Powder	131 (43.9)	167 (56.1)
Vaseline	13 (4.4)	285 (95.6)
Coconut oil	85 (28.5)	213 (71.5)
Methylated spirit with cotton wool	4 (1.3)	294 (98.6)
Herbs	14 (4.7)	284 (95.3)
Saliva	8 (2.6)	290 (97.3)
Nothing applied	25 (8.4)	273 (91.6)
Covering practice		
Do you cover the cord stump?	149 (47.3)	166 (52.7)
What do you use to cover the cord stump? (a piece of clean cloth)	135 (42.9)	180 (57.1)
How do you fold the neonate napkin? (below cord)	258 (81.9)	57 (18.0)
How frequent do you change a neonate cloth? (3 times/d)	210 (66.7)	105 (33.3)
Do you bath a neonate before cord detachment? (yes)	300 (95.2)	15 (4.8)
How do you bath your neonate? (sponge bathing)	140 (44.4)	175 (55.5)

Table 6**Relationship between cord care practices and demographic characteristics (N = 315).**

Variable	Practice level		χ^2	Fisher exact test	P-value
	Good practice	Poor practice			
	n (%)	N (%)			
Age of mothers			0.379		.538
15–19	39 (43.3%)	51 (56.7%)			
20–25	89 (39.6%)	136 (60.4%)			
Residence			2.716		.099
Urban	96 (43.6%)	124 (56.4%)			
Rural	32 (33.7%)	63 (66.3%)			
Marital Status			2.140		.143
Never married	16 (33.3%)	32 (66.7%)			
Married	97 (40.9%)	140 (59.1%)			
Living together	15 (50.0%)	15 (50.0%)			
Level of education				28.997	<.001
No formal	10 (23.8%)	32 (76.2%)			
Primary education	57 (32.8%)	117 (67.2%)			
Secondary education	50 (58.8%)	35 (41.2%)			
Higher education	11 (78.6%)	3 (21.4%)			
Occupation			13.140		<.001
Peasant	43 (30.1%)	100 (69.9%)			
Business	42 (48.3%)	45 (51.7%)			
Housewife	29 (43.9)	37 (56.1%)			
Employed	14 (73.7%)	5 (26.3%)			
Parity			9.989		.002
Primipara	78 (49.4%)	80 (50.6%)			
Multipara	50 (31.8%)	107 (68.2%)			
ANC visits			3.685		.055
1 visit	4 (23.5%)	13 (76.5%)			
2 visits	45 (35.4%)	82 (64.6%)			
3 visits	47 (48.0%)	51 (52.0%)			
4 > visits	31 (43.7%)	40 (56.3%)			
Not attended	1 (50.0%)	1 (50.0%)			
Place of delivery			2.720		.099
Health facility	119 (42.2%)	163 (57.8%)			
Home	9 (27.3%)	24 (72.7%)			

ANC = antenatal care.

their neonate's cord according to the recommended standard. This is similar to the study done in Benin City which revealed that maternal level of education was among the predictors for beneficial cord care practices (as good practices increased with increasing maternal education status^[22] and the study done in Abakaliki, Nigeria and Pakistan which reported that babies whose mothers had no formal education and those who had attained primary level of education had poor practice compared to those mothers who had tertiary level of education.^[7,23]

Findings from this study showed that parity was also among the predictors of cord care practices, as those who were primipara had lower odds of having good cord care practice compared to those who were multipara. This could be explained by the reason that multipara have gathered experience from previous deliveries on cord care. Similar findings have been reported by Asiegbu et al, in Nigeria that women who were primipara had good cord care practice compared to those who had many children.^[7] However, this is contrary to the study of Chizoma et al, which reported that the cord care practice improved with the increasing number of children.^[18] These conflicting findings suggest more studies need to be conducted to confirm the role of parity status in cord care practice.

5. Conclusion

Despite their high knowledge of cord care, young mothers' umbilical cord care practices remain poor, according to this study. Living in urban areas, having a higher education level, and having delivered in a health facility were important factors

in having knowledge on cord care, while having a higher education level, being employed, and being a multipara were important factors in maintaining cord in a healthy state.

5.1. Recommendations

Health Education to mothers on proper cord care practices should be optimized by health care providers during antenatal and postnatal care as improving knowledge of cord will further improve cord care practice. Re-emphasizing cord care knowledge and practice during postnatal care will further discourage harmful practices to prevent newborn infections and reduce neonatal morbidity and mortality. Mothers should continue seeking antenatal care, delivery from health facilities and post-natal care because this can offer them a chance to obtain cord care related information. Community sensitization by health care groups and leaders on the dangerous cultural cord care practices like the application of the dangerous substances to the umbilical cord should be further promoted.

5.2. Limitation of the study

In this study, there were no direct observations of the respondent's practices on cord care and it relied only on self-reported practice. This could lead to under or over reporting of the practice. Moreover, the tool used to assess the knowledge and practice of umbilical cord care was not comprehensive as some important information was left out, e.g., the economic status of mothers as this will affect their practice and knowledge, but

Table 7
Predictors of poor umbilical cord care practices among young mothers (N = 315).

Variable	OR	95%CI		P value	AOR	95%CI		P value
		Lower	Upper			Lower	Upper	
Residence								
Urban	1				1			
Rural	1.52	0.923	2.518	.1	1.09	0.636	1.873	.752
Level of education								
No formal	11.73	2.723	50.563	.001	12.15	2.757	53.561	.001
Primary	7.52	2.02	28.041	.003	7.8	2.020	28.041	.003
Secondary	2.56	0.667	9.878	.17	2.6	0.667	9.878	.170
Higher	1				1			
Occupation								
Peasants	6.51	2.207	19.210	.001	6.61	2.186	20.009	.001
Business	3.0	0.994	9.051	.51	3.61	1.086	10.399	.035
Housewife	3.5	1.153	11.069	.027	4.29	1.343	13.732	.014
Employee	1				1			
Parity								
Prime	0.47	0.303	0.758	.002	0.49	0.303	0.793	.004
Multipara	1				1			
Place of delivery								
Health facility	1				1			
Home	1.94	0.873	4.340	.103	0.59	0.262	1.339	.208
ANC visits								
Not attended	3.25	0.163	64.614	.440	2.91	0.146	58.186	.484
1 visit	1.82	0.111	29.833	.674	1.69	0.103	27.800	.712
2 visits	1.08	0.066	17.844	.954	1.05	0.064	17.393	.969
3 visits	1.29	0.078	21.458	.859	1.24	0.075	20.729	.878
4 visits and above	1				1			

ANC = antenatal care, AOR = adjusted odds ratio.

also the use of chlorhexidine was not assessed. Another limitation worth mentioning is that this was a hospital-based study, so caution should be used when interpreting the results; therefore, a community-based study is recommended

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Author contributions

NK and SA contributed to the design and implementation of the research and analysis of the results. TM, SA, and NK contributed to the writing of the manuscript.

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