

# Knowledge and Practices of Umbilical Cord Care among Mothers Attending Antenatal Care in the Health Facilities in Sokoto Metropolis, Nigeria

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## ABSTRACT

**Introduction:** The risk of cord infection is increased by unhygienic cutting of the cord and application of unclean substances such as sand mixed with saliva, herbal preparations, ashes, palm oil and ground nut oil among others.

This study aimed to assess the knowledge and practices of umbilical cord care among mothers attending antenatal care in the health facilities in Sokoto metropolis.

**Material and methods:** A cross-sectional study was conducted among 363 pregnant women attending antenatal care in the health facilities in Sokoto metropolis selected by multistage sampling technique. A set of pre-tested, interviewer-administered questionnaires were used to collect data on the research variables. Data were analyzed using the IBM® SPSS version 20 statistical package.

**Results:** Majority (60.3%) of respondents were aged 20-29 years with a mean age of 27.62 ±5.4. Most (98.3%) of them were married. Up to (86.0%) of the respondents were Muslims. A larger proportion (42.7%) of the respondents had tertiary education. About half (48.2%) of them were full-time housewives. A high proportion (79.9%) of the respondents delivered their last pregnancy in the hospital. Majority (74.4%) had good knowledge of umbilical cord care while the good practice of umbilical cord was (54.4%) among the respondents.

**Conclusions:** Although the majority of the respondents demonstrated adequate knowledge but the practice of umbilical cord care was suboptimal. Maternal health education on cord care should be emphasized during the antenatal and postnatal clinic visits as well as community education on cord care.

**Keywords:** Knowledge, Practice, Umbilical Cord Care, Pregnant Women, Health Facilities.

cases of umbilical cord infections, for instance, in the University of Port-Harcourt Teaching Hospital, umbilical cord infection accounted for 10% of neonatal admissions and 30% of neonatal deaths.<sup>5</sup> A review of umbilical infection at the University College Hospital Ibadan, showed 18% of neonatal deaths.<sup>6</sup> The incidence of neonatal sepsis from umbilical cord infection keeps increasing because of the increased rate of home deliveries.<sup>7</sup> Little is known on the risk factors for umbilical cord infection especially in the developing countries.<sup>8</sup> However, some of the common risk factors for the development of neonatal omphalitis include low birth weight, prolonged rupture of membrane, umbilical catheterization, and chorioamnionitis.<sup>9,10</sup> Some harmful traditional practices such as the use of old razor blade, an old knife, sharp stones, sewing threads, herbs preparation, palm oil, salt, sand, and saliva were also reported to increase the risk of cord infection.<sup>9,10</sup> The incidence of neonatal cord infection varies from 0.2 – 0.7% in industrialized countries.<sup>11</sup> Nigeria has one of the highest neonatal mortality rate of 37 per 1000 live births.<sup>12</sup> As cord infections are preventable in most cases, it is important to identify the best cord care practice to reduce neonatal mortality and morbidity and offer an alternative to widespread potentially harmful traditional practices.<sup>13</sup> The practice of standard umbilical cord care (UCC) among mothers in developing and developed countries reduces the exposure of the umbilical cord to infectious pathogens such as bacteria, viruses, and fungi.<sup>14,15</sup>

In this view, mothers should be familiar with the practice of standard UCC, and prevention of exposure of umbilical

## INTRODUCTION

The care of the umbilical cord varies between communities and depends on the level of education of the mothers, cultural and religious beliefs and availability of resources.<sup>1</sup> Umbilical cord infection is a major cause of neonatal morbidity and mortality in developing countries.<sup>2</sup> Over one million newborn dies annually as a result of umbilical cord infection<sup>3</sup> The risk of cord infection is increased by unhygienic cutting of the cord and application of unclean substances such as sand mixed with saliva, herbal preparations, and lantern wax.<sup>4</sup> Even babies delivered in hospitals may be affected by traditional practices after discharge which most times lead to umbilical cord infection and death among the neonates.<sup>4</sup> Several hospital-based studies in Nigeria have reported

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cord stump to dangerous pathogens during delivery and postnatal period so as to reduce the incidence of umbilical cord infection.<sup>16</sup>

Clean umbilical cord care involves washing hands with soap and water before delivery, tying and cutting the umbilical cord with a sterile instrument, and finally laying the baby on a clean surface.<sup>17</sup>

The sterile materials that were recommended to be used in tying the umbilical cord include, sterile plastic cord clamp, narrow tapes, and threads of cloth; these materials if properly applied and are sterile will effectively prevent or reduced morbidity and mortality from umbilical infection.<sup>17</sup> The instrument recommended in cutting the umbilical cord should be sharp and sterile to avoid trauma and infection of the umbilical cord.<sup>17</sup> Such instruments include the following: new razor blade, sterile scissors, and sterilized knife.<sup>19</sup> The normally recommended practices is to clean the umbilical cord with a cotton swab soaked in methylated spirit and left uncovered so as to promote drying, healing, and cord separation.<sup>17</sup>

During the cleansing process, the diaper should be folded below the umbilicus, and attention paid to the base of the umbilical cord to prevent infection this is because the base is wet and dark therefore can form a nutritive culture medium for growing bacteria.<sup>18</sup> This practice should be adopted by mothers to promote healing, preventing umbilical cord infections, and significant risk of morbidity and mortality to the child.<sup>18</sup>

Even though several studies conducted across communities and health facilities in Nigeria showed varying levels of good knowledge of cord care among mothers,<sup>19-21</sup> the practice of cord care among these group of people based on the findings of some studies in Nigeria and Ghana both in the West African sub-region reported unsatisfactory levels of cord care practice and this has a serious impact on the increased risk of infections and mortality during the neonatal period.<sup>22-24</sup>

## MATERIAL AND METHODS

This was a cross-sectional study design carried out among pregnant women attending antenatal care in the health facilities in Sokoto metropolis, Sokoto state, Nigeria. Pregnant women who had one or more deliveries and attending antenatal clinics in the selected health facilities were considered eligible for enrolment into the study.

### Sample size estimation and Sampling Technique

The sample size was estimated at 363 using Fisher's formula for calculating sample size for descriptive studies<sup>25</sup>; a 61.4% prevalence regarding the good practice of umbilical cord care from a previous study<sup>26</sup>, precision level of 5%, and an anticipated response rate of 90% was used. The eligible participants were selected by a 2-stage sampling technique. At the first stage, one health facility was selected from each of the 5 metropolitan LGAs by simple random sampling using the balloting option. At the second stage, eligible participants were selected in each of the selected health facilities (in direct proportion to the number of pregnant

women attending antenatal clinic per week in the respective health facilities) by systematic sampling technique using the Antenatal Clinic attendance register in the respective health facilities to constitute the sampling frame.

### Data collection

A semi-structured, interviewer-administered questionnaire was developed and used to obtain information on the respondents' socio-demographic characteristics, and knowledge, and practice of umbilical cord care. The questionnaire was reviewed by senior researchers in the department to ascertain content validity. It was then pretested on 30 pregnant women attending Antenatal Clinic at Sarkin Adar PHC, Sokoto, Nigeria. Some questions were rephrased for clarity based on the observation made during the pretesting.

Five final year medical students and three medical records staff assisted in questionnaire administration after pre-training on the conduct of survey research, the study objectives, and questionnaire administration. Ethical clearance was obtained from the Ethical committee of the State Ministry of Health, Sokoto, Nigeria. Permission to conduct the study was obtained from the administration of the respective LGAs, while informed written consent was also obtained from the participants before data collection

### Scoring and Grading of Participants Knowledge and Practice of Umbilical Cord Care

Respondents' knowledge of Umbilical cord care was scored and graded on a 26-point scale. One point was awarded for a correct response, while a wrong response or a non-response received no point. This gives a minimum score of '0' and a maximum score of '26' points. Those that scored equal to or greater than 50% of the maximum knowledge score (i.e.,  $\geq 13$  of 26 points) were considered as having 'good' knowledge, while those that scored less than 50% of the maximum knowledge score (i.e.,  $< 13$  of 26 points) were graded as having 'poor' knowledge.

Respondents' practice of umbilical cord care was scored and graded on an 8-point scale. One point was awarded for a correct response, while a wrong response or a non-response received no point. This gives a minimum score of '0' and a maximum score of '8' points. Those that scored equal to or greater than 50% of the maximum practice score (i.e.,  $\geq 4$  of 8 points) were considered as having 'good' practice, while those that scored less than 50% of the maximum practice score (i.e.,  $< 4$  of 8 points) were graded as having 'poor' practice.

## STATISTICAL ANALYSIS

Data were analyzed using the IBM® SPSS Statistical Package version 20. Frequency runs were done for further editing and cleansing of the e-data. Frequency distribution tables were constructed; and cross-tabulations were done to examine the relationship between categorical variables.

## RESULTS

### 3.1 Socio-demographic characteristics of respondents.

All the 363 questionnaire administered were retrieved and

analyzed. The ages of the respondents ranged from 18 to 58 years (mean = 27.62±5.4 years). The majority (60.3%) of them were aged 20-29 years. Most (98.3%) of the respondents were married and up to (85.1%) of them have less than five children. A greater proportion (86.0%) were Muslims and Hausas (62.3%) (Table-1).

The majority (79.9%) of the respondents delivered in the hospital. Respondents who attended tertiary institutions were (42.7%) and secondary school (31.7%). Housewives constituted (48.2%) and civil servants were (34.7%).

**Respondents' knowledge of umbilical cord care**

Most (87.6%) of the respondents knew about umbilical cord care. The majority (90.6%) of them knew that umbilical cord care involves tying, cutting the cord and cleaning with spirit or chlorhexidine. Up to (71.6%) of them knew that herbs should not be used for umbilical cord care.

Most (84.3%) of the respondents knew the signs (offensive odour) of umbilical infections. Most (86.8%) of them knew the appropriate materials to be used in cutting the cord, new razor blades (84.3%), and sterile scissors (75.8%) in cutting the cord. Up to (83.2%) of the respondents knew that a cord clamp is an appropriate material used in tying the umbilical cord.

Most (85.1%) of the respondents knew that Methylated spirit or Chlorhexidine is used in cleaning the umbilical cord while up to (86.5%) of them knew that hands should be washed before (94.2%) and after (95%) cleaning the umbilical cord. Most (94.2%), of the respondents, knew that appropriate cord care prevents infection (94.2%), abdominal pain (80.4%), and odour discharge (82.4%) (Table-2).

**Respondents' practice umbilical cord care**

Majority (59.2%) of the respondents had performed umbilical cord care while (40.8%) of those who did not perform umbilical cord care reported that it was done either by the grandmother or Traditional Birth Attendants (TBA) (Figure-1).

Close to half (46.8%) of the respondents used a new razor blade to cut the umbilical cord while (40.8%) used a surgical blade.

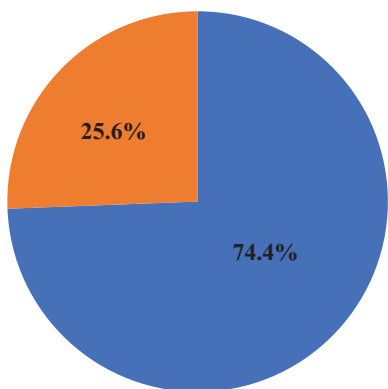
More than half (51.0%) of the respondents used cord clamp for clamping the umbilical cord while 22.6%, 11.6%, 6.9%, and 6.9% used sewing thread, hair thread, a string

of cloth, and bandage respectively. Majority (83.5%) of the respondents used methylated spirit/chlorhexidine in cleaning the cord.

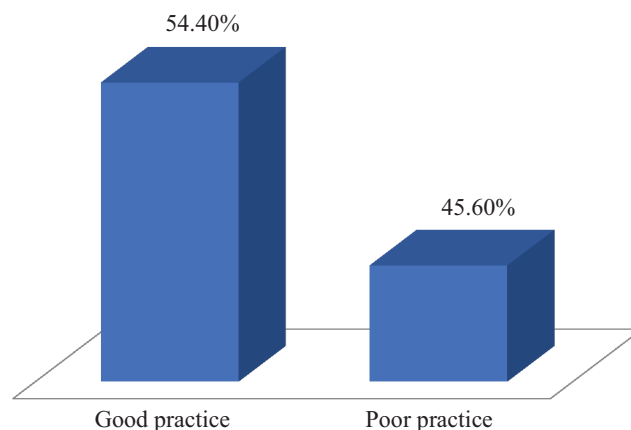
Most (90.9%) of the respondents washed their hands before taking care of the umbilical cord, up to (92.3%) washed their

Variables	N=363 (Number (%))
Age Group (years)	
Below 20 years	12(3.3)
20-29 years	219(60.3)
30-39 years	125(34.4)
40-49 years	6(1.7)
≥50	1(0.3)
Mean age of respondents	27.62±5.4
Tribe	
Hausa	226(62.3)
Fulani	48(13.2)
Yoruba	27(7.4)
Igbo	24(6.6)
Others	38(10.4)
Marital Status	
Single	5(1.4)
Married	357(98.3)
Divorce	1(0.3)
Number of children	
<5	309(85.1)
≥5	54(14.9)
Religion	
Islam	312(86.0)
Christianity	51(14.0)
Place of last delivery	
Hospital	290(79.9)
Home	73(20.1)
Level of education of respondents	
Tertiary	155(42.7)
Secondary	115(31.7)
Primary	19(5.2)
Quranic school	74(20.4)
Occupation of respondent	
Civil servant	126(34.7)
Business/Farmers	62(17.1)
Full-time House Wife	175(48.2)

**Table-1:** Socio-demographic characteristics of respondents.



**Figure-1:** Respondents' knowledge of umbilical cord care.



**Figure-2:** Respondents' practice of umbilical cord care.

Variables	N=363 Number (%)
Know umbilical cord care	
Yes	318(87.6)
No	36(9.9)
I don't know	9(2.2)
Umbilical cord care involves the Application of:	
Herbs on the cord	
Yes	67(18.5)
No	260(71.6)
I don't know	36(9.9)
Cow dung	
Yes	22(6.1)
No	264(72.3)
I don't know	77(21.2)
Tying, cutting, and cleaning with methylated spirit	
Yes	329(90.6)
No	22(6.1)
I don't know	12(3.3)
Signs of umbilical cord infection:	
Offensive odour from the cord	
Yes	306(84.3)
No	10(2.8)
I don't know	47(12.9)
Discharge from the cord	
Yes	300(82.6)
No	12(3.3)
I don't know	51(14.1)
Dryness of the cord	
Yes	28(7.7)
No	273(75.2)
I don't know	62(17.1)
Materials used in cutting the umbilical cord	
New razor blade	
Yes	306(84.3)
No	37(10.2)
I don't know	20(5.5)
Scissors	
Yes	275(75.8)
No	69(19.0)
I don't know	19(5.2)
Sharp stone	
Yes	3(0.8)
No	280(77.1)
I don't know	80(22.0)
Appropriate material to be used in tying the umbilical cord	
String of clothes	
Yes	113(31.1)
No	223(61.4)
I don't know	27(7.4)
Rubber band	
Yes	57(15.7)
No	251(69.1)
I don't know	55(15.2)
Cord clamp	
Yes	302(83.2)
No	42(11.6)

I don't know	19(5.2)
Hair thread	
Yes	204(56.2)
No	125(34.4)
I don't know	34(9.4)
Bandage	
Yes	16(4.4)
No	244(67.2)
I don't know	103(28.4)
Appropriate material used in cleaning the umbilical cord:	
Herbal solution	
Yes	51(14.0)
No	271(74.7)
I don't know	41(11.3)
Methylated spirit or Chlorhexidine	
Yes	309(85.1)
No	28(7.7)
I don't know	26(7.2)
Hot water	
Yes	256(70.5)
No	74(20.4)
I don't know	33(9.1)
Hair lotion	
Yes	16(4.4)
No	269(68.3)
I don't know	78(21.5)
When to observe hand washing in cord care:	
Before cord care	
Yes	342(94.2)
No	8(2.2)
I don't know	13(3.6)
After cord care	
Yes	345(95.0)
No	3(0.8)
I don't know	14(3.9)
Before and after cord care	
Yes	314(86.5)
No	25(6.9)
I don't know	24(6.6)
How to clean the cord	
Clean the base of the cord before the surrounding area	
Yes	222(61.1)
No	99(27.3)
I don't know	42(11.6)
Benefits of clean cord care include:	
Prevention of cord infection	
Yes	342(94.2)
No	7(1.9)
I don't know	13(3.6)
Prevent the child from having abdominal pain	
Yes	292(80.4)
No	34(9.4)
I don't know	36(9.9)
Prevent odour and discharge from the cord	
Yes	299(82.4)
No	33(9.1)
I don't know	30(8.3)

**Table-2:** Respondents' knowledge of umbilical cord care

hands after taking care of the umbilical cord. The majority (66.7%) of the respondents clean the umbilical cord after each diaper is changed (Table-3) (Figure-2).

Variable	f (%)
Performed umbilical cord care	
Yes	215(59.2)
No	148(40.8)
Reason for not performing umbilical cord care	
I don't know how to do it	4(2.7)
My mother in law/grandmother do it for me	101(68.2)
TBA did it	43(28.4)
Number of times performed umbilical cord care	
<5	174(80.9)
≥5	41(19.1)
The material used to cut the umbilical cord	
Scissors	40(11.0)
New razor blade	170(46.8)
Surgical blade	148(40.8)
Sharp stone	1 (0.3)
The material used in tying the umbilical cord	
Sewing thread	82(22.6)
Hair thread	42(11.6)
String of clothes	25(6.9)
Bandage	25(6.9)
Cord clamp	186(51.3)
Materials used for cleaning the umbilical cord	
Methylated spirit or chlorhexidine	303(83.5)
Herbs preparations	11(3.0)
Cow dung	7(1.9)
Vaseline jelly	15(3.13)
Saliva and sand	10(2.75)
Ashes	7(1.9)
Toothpaste	5(1.37)
Palm oil	5(1.37)
Always clean the base of the cord before the surrounding area	
Yes	202(56.1)
No	158(43.9)
Washed hands before taking care of the umbilical cord	
Yes	330(90.9)
No	30(8.3)
Reason for not washing hands	
I don't have time to wash my hands	23(76.7)
Not important	7(23.3)
Washed hand after cleaning care of the umbilical cord	
Yes	335(92.3)
No	25(6.9)
Reason for not washing hands	
I don't have time to wash my hands	21(84.0)
Not important	3(12.0)
Clean cord after each diaper is changed	
Yes	242(66.7)
No	119(32.8)
Reason for not cleaning cord after each diaper was changed	
I don't know am supposed to clean it	89(74.7)
Is not necessary	30(25.3)

**Table-3:** Respondents' practices of umbilical cord care

## DISCUSSION

The respondents in this study were of a relatively young population with a mean age of 27.62±5.4 years, and majority of them (60.3%) were between the ages of 20 and 29 years. This could be due to the fact that all the respondents selected for this study were within their reproductive ages. This compares well with the age distribution of the respondents in a study conducted in Calabar South LGA, Cross River state, Nigeria where the ages of the participants ranged between 20-29 years<sup>19</sup>, but at variance with the finding of a study carried out in Ethiopia where the ages of the respondents ranged between 20-40 years.<sup>31</sup>

Most (98.5%) of the respondents were married, this commensurate with a study carried out in Jos, Plateau State, Nigeria where the majority (89.5%) of the respondents were married,<sup>33</sup> it is also in consonance with studies conducted in Calabar South LGA and Calabar metropolis, Cross Rivers state, Nigeria, where the majority of the respondents (86.7%) and (78.4%) respectively were married mothers.<sup>19,21</sup>

The preponderance of Muslims (86.0%) and Hausa tribe (62.3%) among the respondents in this study could be due to the fact that Islam is the predominant religion in northern Nigeria, and majority of the inhabitants in the study area were Hausas. This is similar to a study in Kano state, north-western Nigeria where the majority of the respondents were Muslims and Hausas<sup>26</sup>, but in contrast to a study conducted in Calabar South LGA, Cross River State, Nigeria, in which most (98.7%) of the respondents were Christians.<sup>19</sup>

The findings in this study showed that majority (42.7%) of the respondents had tertiary education. This disagrees with a study conducted in Calabar Metropolis, Cross River state, Nigeria; which reported majority (41.8%) of the respondents to have had only secondary school education<sup>21</sup>, it is also in variance with a study conducted in Pumwani Nairobi city, Kenya where the majority (52.8%) of the respondents had secondary school education.<sup>32</sup>

In this study majority (79.9%) of the respondents had their last delivery at a health facility. This is in contrast to the finding in a study conducted in the rural community of Sokoto where the majority (70.7%) of the respondents delivered their last pregnancy at home.<sup>27</sup>

From the results obtained in this study, majority of the respondents (74.4%) demonstrated good knowledge of standard umbilical care, the good knowledge obtained in this study may be attributed to the fact that the study subjects were drawn from ANC in health facilities across the metropolis where correct and factual information on care of newborns including cord care is usually provided. This finding corroborates the finding in a study in Oshogbo, Osun State, Nigeria, where (82.9%) of the respondents had good knowledge of cord care<sup>29</sup>, it is also in agreement with a study in Abakaliki, Ebonyi state and in Calabar, Cross River State, Nigeria, where good knowledge of cord umbilical care (UCC) among mothers were (60.34%) and (55.3%) respectively.<sup>20,21</sup> But in contrast to a study done in Ibadan, Oyo State, southwest Nigeria, where less than half (48.1%)

of the respondents had good knowledge of UCC<sup>22</sup>, it is also at variance with a study in Kenya where (60%) of the mothers had poor knowledge of UCC.<sup>32</sup>

More than half (59.2%) of the mothers have observed Umbilical cord care, the remaining (40.8%) who did not do so, reported that it was done by the grandmothers or Traditional Birth Attendants, this is similar to a study in Yenogowa, Bayelsa, Nigeria where (48.4%) of the respondents stated that cord care was done by the grandmothers.<sup>28</sup> Among the mothers who observed cord care, (54.4%) had a good practice, this is commensurate with a study done in Ibadan, Oyo state and in Kano State, Nigeria, which documented (60.9%) and (61.4%) respectively, good practice of cord care among mothers<sup>22, 26</sup>, it is also in agreement with a study carried out in Ghana, Oshogbo, Osun State, Nigeria, and in Kenya, where (82.9%), (72.0%) and (66.0%) respectively of the respondents had a good practice of umbilical cord care.<sup>24, 29, 32</sup> But it is in contrast to a community-based study carried out in Sokoto where less than half (40.7%) of the respondents had a good practice of cord care.<sup>27</sup> This study is also in disagreement with studies done in Borno state, Yenogowa, Bayelsa State and Benin City, Edo state, Nigeria where the majority of the respondents (79.5%), (62.4%) and (91.6%) respectively had a poor practice of umbilical cord care.<sup>23, 28, 30</sup> The common materials used in cutting the baby's cord in this study were, surgical blade and new razor blade (40.8%) and (46.8%) respectively this is in synergy with a study done in Bayelsa where the surgical blade and new razor blade were used in (38.0%) and (36.2%) of the respondents respectively,<sup>28</sup> it is also in consonance with a study in Calabar metropolis where new razor blades were used to cut the cord in (47.9%) of cases.<sup>21</sup> This study revealed the common items used in tying the cord among mothers to include cord clamp (51.3%), sewing thread (22.6%), and hair thread (11.6%), this is similar to a study in Bayelsa state where Cord clamp and black hair thread were the commonest items used in tying the cord<sup>28</sup>, and in Benin city where thread (65.6%) and plastic cord clamp (22.7%) were used to clamp umbilical stump.<sup>30</sup> More than half (56.1%) of the mothers clean the base of the cord first before the surrounding this is also in agreement with a study in Calabar metropolis which showed that (55.9%) of the mothers clean the base of the cord before the surrounding area<sup>21</sup>, but it differs from a study in Sokoto which revealed that cleaning the base before the surrounding area was (28.2%) among the mothers.<sup>27</sup> Majority of the mothers practiced hand washing before (90.9%) and after cleaning the cord (92.3%), this is similar to a study done in Benin city where (86.9%) and (89.3%) of mothers respectively practiced hand washing before and after cord care.<sup>30</sup> But it is in contrast to a study in Calabar metropolis which reported that only (22.7%) of mothers washed their hands.<sup>21</sup> This study reported that up to (66.7%) of the mother clean the cord after changing the diaper, similar finding was also documented in Calabar metropolis, Cross River state where (74.8%) of the mothers clean the cord every time when changing the diaper.<sup>21</sup>

## CONCLUSION

Although majority of the respondents in this study demonstrated adequate knowledge, the practice of umbilical cord care among the respondents was suboptimal. Maternal health education on cord care should be emphasized during the antenatal clinic visits as well as community education on cord care among the grandmothers and TBA since a significant proportion of them perform cord care at the community level.

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