

**SOCIAL VARIABLES AND UMBILICAL CORD MANAGEMENT: PERCEPTION OF  
NURSING MOTHERS IN CALABAR EDUCATION ZONE, CROSS RIVER STATE,  
NIGERIA**

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**Abstract**

*This study investigated the influence of social variables on umbilical cord management among mothers in Calabar Education Zone, Cross River State. The study was guided by three research questions. The Survey design was adopted for this study. Using the multistage sampling technique, the population of 1,068 respondents was reduced to a sample of 748 nursing mothers in the area of study. Umbilical Cord Nursing Mothers Management Status Questionnaire (UCNMMSQ) was the instrument used for data collection. The Cronbach's alpha method was used to analyse the trial test data, with reliability estimates for the variables ranging from 0.50 to 0.81. Findings showed a positive influence of maternal education level, delivery and maternal knowledge of cord care on neonatal umbilical cord management respectively. It was concluded that the impact of maternal education level, place of delivery, and maternal knowledge of cord care are all the major social factors to which nursing mothers and health care workers must pay due attention to ensure effective delivery of quality patient care.*

**Keywords:** Child delivery, maternal knowledge, newborn mortality, nursing mothers, Umbilical cord management



## Introduction

Fragility and susceptibility to infections are common attributes of newborns especially in the first 28 days of the infant's life. Thus, they are always handled carefully to prevent neonatal death or permanent deformity. This is why nursing mothers, as the primary care providers, play important roles in ensuring that newborns develop optimally; as the newborns' health and survival is dependant on the essential care received before, during and after delivery. Therefore, umbilical cord care or management is a vital care infant must receive to prevent infections that may lead to neonatal morbidity and mortality (Keraka, 2019; Osuchukwu, 2014). In Calabar Education Zone, especially in the hinterlands, many lives of infants are lost on grounds of carefree attitudes of some nursing mothers. The history of infant mortality among women in the research area is not quiet new. Over the years there has been a distinct record of children dying at an early stage of life due to poor umbilical cord management. It is not news but a trend that is worrisome. In the last five years data available shows that not less than numerous number of children died as a result of umbilical cord related infections and poor management. Enor and Ekpo (2018) disclosed how one man who had seven females in a bid to have a male lost the only female infant that came at last due to infections in the umbilical cords. The likes stories above abound in the area of study. It is therefore, established that there could be poor management of umbilical cords among the nursing mothers in Cross River State, especially in Calabar Education Zone. This development has given worry to all, generally; but provoked the researcher most, given her profound interest in the problem. Furthermore, Oestergaard, Inoue, Yoshida, Mahanani, Gore, Cousens, Lawn and Mathers (2011) reported that more than 30% of deaths are caused by infections that are from the umbilical cord.

The umbilical cord is a unique tissue consisting of two arteries and one vein which, is about 56cm in length and extends from the placenta to the umbilicus of the unborn baby (Peter & Johnson, 2010). During pregnancy,

the umbilical cord connects the foetus to the mother through the placenta. The blood flowing through the cord brings nutrients and oxygen from the mother to the foetus and carries away carbon dioxide and other metabolites from the foetus (Bello & Omotara, 2010; Ezenduka & Eze, 2002). However, it is no longer needed, once the baby is born. Within few minutes of birth, the cord is clamped and cut. The baby's cord stump now remains wet, fresh with an open surface wound and blood vessels still patent. These remain a medium for bacterial growth if not properly taken care of (Hernayanti, Purnamaningrum & Kusmiyati, 2018). At this point, some degree of hygiene practices must be adopted to adhered to, prevent infection; which may present with the following signs and symptoms – yellow discharge from the cord, foul-smelling discharge from the stump, tenderness of the skin around the cord, active bleeding from the cord, pain on touch, excessive cry and bout of fever (Paudel, Sara, Gouranga & Lareen, 2019). These strengthen the need for standard cord management among mothers as well as other care givers (Bemor & Uta, 2011). The foregoing endorses the danger and challenges in managing the umbilical cord.

The managerial skill of the nursing mothers seems not to be easy with them; hence, it has far-reaching effects and consequences. The brunt is borne by both the infants and the nursing mothers. There is an obvious high death rate of infants which affects the nursing mothers psychologically and physically. This seriously situation has aroused public outcry and serious concerns to both the public and health workers as well. There are no doubts about the several efforts authors have made in the world of research to checkmate this ugly trend. The above unpinned the present research to address other variables. In this study, these other variables include maternal educational level, place of delivery, maternal knowledge of cord care as perceived correlates of neonatal umbilical cord management.

The foremost variable is the educational level of nursing mothers. There is a world of difference between the educated and uneducated in terms of how each manages the

umbilical cord and one that does not; this, in effect, had something in stock in the management (Osuchukwu, Ezeruigbo, Akpan-Idiok, & Asuquo, 2021). Maternal education level cannot be overemphasized as several studies have shown that educated mothers were more likely to provide better umbilical cord care and take decisions concerning their children's health (Eneji, Eyamba & Makinde, 2010; Green, Udoh & Peter 2006; Kelly, Morse, Stover, Hofkens, Huisman, Shulman, Eisen, Becker, Weinfurt, Boland & Pilkonis, 2011; Osuchukwu, et al., 2021; Peter & Johnson, 2010; Tuladhar, 2010). Evaluating the umbilical cord care practices in the said locality (Southern Cross River), will guide recommendations for attitudinal change for safer practices. An earlier study reported that educated mothers were more likely to take their children to modern health facilities for treatment and that they were more autonomous concerning decisions about their children's health (Caldwell, 2013). According to Tuladhar (2010), a higher level of educational attainment has a positive effect on the decision to practice clean cord care.

Despite the global success in the campaign to eliminate neonatal morbidity, Saleh, Walla and Adamu (2015) discovered that in 25 developing countries, where most deliveries are conducted by traditional birth attendants (TBAs), neonatal tetanus as a result of poor umbilical cord management, was the leading cause of death among new-borns. Ros, Lê, Fustukian and McPake (2019) and Emeribe and Akah (2011) also reported that the education of the mother has a strong influence on the utilization of maternal health services and child survival; as educated women are more likely to break away from tradition, to use modern means of safeguarding their health and that of their children; they are better able to use the available services in their community to their advantage and seek quality health services. In Calabar South, Nigeria, Peter and Johnson (2010) revealed that 44.7% of their respondents had good knowledge of standard cord care and their major sources of information were from mothers/mothers-in-law. The researchers reported a significant

correlation between mothers' level of education and clean cord management.

In Pakistan, Quddus, Luby, Rahbar and Pervaiz (2002) reported that mothers had poor knowledge about the care of the umbilical cord. The researchers concluded that mothers were the principal providers for skin and cord care during the neonatal period; hence, there was a great need to ensure that they are empowered with the right knowledge to enable them to offer the right practices. Tuladhar (2010) reported that a highland-infections such as tetanus are associated with poor cord care practices. Favourably, a high level of awareness of clean delivery practices by younger mothers was reported in the study of Osuchukwu et al. (2021).

It is because of this awareness; the researcher concluded that mothers are less likely to attract infections such as tetanus associated with poor care practices. Despite good knowledge about infection control, Cannon, Charyeva, Oguntunde, Sambisa, Shoretire and Orobato, (2017) reported that the actual clean delivery practice was poor among physicians and nurses in maternity wards. This entails that more attention is given to the education of clean service delivery to curtail the issue of poor management of umbilical cord among mothers (Sumankuuro, Crockett & Wang (2018). This confirms the findings of the study of Göger, Özkent, Ünlü, Kocaoğlu, Madenci, and Pişkin (2020) that higher educated mothers were not knowledgeable than those with less educational status.

Considering the case of the umbilical cord and neonatal infection in developing countries, almost half of all births take place at home, and by untrained birth attendant present at one in every four births. In India, Baqui, Ahuja, and Srivastava (2006) showed a significant variation in the cord care practice according to program exposure and background characteristics. The researchers opined that promoting clean cord care practice among the neonates in community-based maternal and newborn care programs can be an effective tool for decreasing the neonatal mortality rate in the county. Similarly,

Enakpene (2010) found that neonates whose mothers used a clean-delivery kit were significantly less likely to develop an infection of the umbilical cord and that mothers who used a clean delivery kit also had considerably lower rates of puerperal infection. In Zambia, Lawn and Cousens (2004) reported that more than half of the women deliver at home for several reasons including lack of transportation, lack of access, lack of funds, and by preference. According to the researchers, these home deliveries have indicated that in low resource settings and births attended by unskilled birth attendants, there is an increased risk of neonatal tetanus, omphalitis and sepsis. This conforms to the position of Tuladhar (2010) that hygienic umbilical cord care is necessary for the well-being of the newborn.

In Bangladesh, Andrew and Dala (2011) observed that more than 80% of women delivered at home with 6% of cases reported having used blades from a clean-delivery kit to cut the cord. The study also reported that 90% of cases, used blade from another source with 4% of cases, used other instruments such as bamboo strips and scissors to cut the cord. In the study of Andrews and Dalal (2011), place of delivery was found to predispose infants to some complications among (200 out of 300) women in Northern Nigeria who delivered at home. As reported by some scholars, these deliveries are conducted by untrained birth attendants, and some traditional cord practices are harmful (Cannon et al., 2017). This conforms the findings of Abhulimhen-Iyoha and Ibadin (2011) that mothers of babies delivered in traditional birth attendants' places, maternities and some private hospitals are more likely to apply harmful agents and substances on infants delivered in similar settings, as well as, state hospitals in comparison with teaching hospitals.

In terms of maternal knowledge of cord care, this study tries to address whether or not nursing mothers are aware of how to care for the cord of their babies. In 2010, Senarath reported that lack of knowledge of standard cord care is an important factor underlying unhygienic umbilical cord management among

mothers. The research of Ansong (2019) noted that mothers who are knowledgeable of standard cord care and the possible risk of non-adherence, are more likely to employ standard cord management. This is because the lack of such knowledge affects a mother's ability to make independent decisions on cord care; especially among the primiparous and these neonates are thus in a vulnerable situation (Senarath, 2010).

Mohamed, Vishnu and Maheswari (2010) revealed that knowledge of mothers was inadequate in areas of umbilical cord care, thermal care and vaccine-preventable diseases. The researchers added that the awareness and attitude of postnatal mothers towards neonatal care has lots of lacunae especially in those who fall among the low socio-economic status. The knowledge and practice of mothers towards newborn umbilical cord care revealed that newborn health and survival was enhanced by providing essential care such as keeping the newborn clean, regulating and maintaining body temperature, vaccination for neonatal tetanus and other care of newborn illness (Bhandari & Paudyal, 2016). In addition, Abhulimhen Iyoha and Ibadin (2015) reported that mothers' knowledge, skills, experience and attitudes determine the care received by their newborns. The cited studies highlighted some beneficial and harmful cord care practices on infants in some developing countries and these practices were influenced by education and delivery systems.

It is worthy of note that very few studies have been done using these variables and umbilical cord management among mothers in Cross River State. Again, no study has been carried out to ascertain the socio-cultural variables and umbilical cord management among nursing mothers; hence, there exists a gap that this present study intends to fill. The study promises to be of immense benefits to the health personnel like doctors and nurses to sharpen their practices based on data-driven evidence from current research literature on how to manage umbilical cord. The study may also be useful in health education classes; especially, when teaching expectant mothers, safe health practices. The

study would also be important to traditional birth attendants, through the provision of additional knowledge on how to adopt safer practices in the management of umbilical cord, different from what they are used to. This would improve the quality of health education given to women in health care facilities. The study is also relevant to nursing mothers, as it may serve as a corrective measure to enable them to adopt safe practices of cord care that will prevent neonatal infections; protect and preserve the lives of babies. This will in turn reduce the rate of maternal and child morbidity as well as mortality among nursing mothers.

### **Purpose of the study**

The present study was undertaken to investigate the influence of social variables on umbilical cord management among nursing mothers in Calabar Education Zone, Cross River State, Nigeria. Specifically, the study sought to find out the influence of:

- i. maternal education level on neonatal umbilical cord management by nursing mothers in  
Calabar Education Zone;
- ii. place of delivery on neonatal umbilical cord management by nursing mothers in  
Calabar Education Zone;
- iii. Maternal knowledge of cord care on neonatal umbilical cord management by nursing  
mothers in Calabar Education Zone.

### **Research questions**

The following research questions were framed to guide the study.

- i. How does maternal education level influence neonatal umbilical cord management?
- ii. How does place of delivery influence neonatal umbilical cord management?
- iii. To what extent does maternal knowledge of cord care influence the choice of substance  
used on neonatal umbilical cord management?

### **Methodology**

The survey research design was adopted for this study. This design was chosen because it is useful in describing the characteristics of a large population, providing a more accurate and broader sample to gather targeted results in which conclusions can be drawn and important decisions made (Akpabio & Ebong, 2015). The population for this study comprised of 1,068 nursing mothers receiving post-natal services in public health facilities in Calabar Education Zone (Ministry of Health, Cross River State, 2018 statistics of nursing mothers). The multi-stage sampling procedure was employed for this study. Simple random sampling was then employed to get the 748 nursing mothers who delivered within the past six months and currently obtaining postnatal health care services including routine immunization.

The instrument for the study is a self-structured questionnaire tagged: "Umbilical Cord Nursing Mothers Management Status Questionnaire (UCNMMSQ)". The instrument has two parts "A" and "B". In part 'A', the respondents were required to tick five-item status though each has valid response options. Part B has 15 item statements on a modified four-point Likert scale of SA, A, D and SD. The items generated were based on personal experiences, observations and reviewed literature. Three experts subjected the instrument to both face and content validity. A parcel each that contains the study title, the purpose of study, research questions, hypotheses and operational definition of variables was given to respective experts: one from measurement and evaluation and two from human kinetics and health education. The researcher ensured treated their inputs and corrections were well articulated. This gave the final status of the instrument, which in the end, was considered valid.

To determine the reliability of the instrument, a trial test was conducted, involving 36 respondents who are not part of the sample of the main study. Cronbach's alpha method was used to analyse the data obtained from the respondents. This method was chosen to ascertain the degree of internal consistency of the instrument in measuring the variables

under study. The result of the reliability estimates for the variable ranged from 0.50 to 0.81. This co-efficient justify that the items and the entire instrument are reliable. The analysis of the main study was done using percentage.

## Results

### Demographic characteristics of respondents

The result of the demographic analysis showed that, of the 748 respondents, 23 (3.1%) of the respondents did not attend a school, 147 (19.6%) attended a primary school, 401 (53.6%) attended a secondary school, while 177 (23.7%) had attended a tertiary institution. This shows a strong variation in the respondents' participation in the study primary data collection process. In terms of the classification based on place of care received during pregnancy, data shows that 343 (45.9%)

of the respondents received care in Hospital/Health centre; 205 (27.4%) received care from TBAs; 31 (4.1%) received care from a Church Midwife; while 169 (22.6%) received care in private Clinic. The classification, based on the number of times mothers were taught umbilical cord care management, also showed that 52 (7.0%) of the respondents stated once; 511 (68.3%) stated 2-3 times, 185 (24.7%) stated 4 times and above. The classification based on the place of birth shows that 232 (31.0%) of the respondents gave birth at Hospital/Health centres; 303 (40.5%) in TBAs; 115 (15.4%) in their home; while 98 (13.1%) in Church.

### Research question one

How does maternal education level influence neonatal umbilical cord management?

**Table 1. Influence of maternal education level and neonatal umbilical cord management**

Variable	Response				
	SA f (%)	A f (%)	D f (%)	SD f (%)	Total f (%)
Educated mothers would refuse to apply cow dung on the baby's umbilical stump to prevent bleeding when it falls off.	356(47.6)	108(14.4)	146(19.5)	138(18.5)	748(100)
Usage of herbal leaves and hot oil for cord care is common for mothers with low education level.	211(28.2)	297(39.7)	62(8.3)	178(23.8)	748(100)
The educational level of nursing mothers greatly determines their use of sterilized sharp instrument while cutting off the umbilical cord.	299(40.0)	171(22.9)	164(21.9)	114(15.2)	748(100)
Mother of low educational level would often use hair thread to tie the cord of their child.	301(40.2)	174(23.3)	211(28.2)	62(8.3)	748(100)
Educated mothers would always keep the umbilical cord stump above the water when bathing the baby.	220(29.4)	237(31.7)	138(18.5)	153(20.4)	748(100)

The result in Table 1 depicts the opinions of the respondents on the influence of maternal education level on neonatal umbilical cord management. Out of 748 respondents, 356 (47.6%) strongly agreed that educated mothers would not apply cow dung on the baby's umbilical stump to prevent bleeding when it

falls off, 108 (14.4%) agreed to it, 146 (19.5%) disagreed to it while 138 (18.5%) strongly disagreed to it. Good number of the respondents, 297 (39.7%), agreed that usage of herbal leaves and hot oil for cord care is common among mother with low level of education; 299 (40.0%) strongly agreed that the

level of education of nursing mothers determine their use of sterilized sharp instrument in cutting off the umbilical cord; 301 (40.2 %) strongly agreed that mothers of low educational level would often use hair thread to tie the cord of the child; while 220 (29.4 %) strongly agreed that educated mothers

would keep the umbilical cord stump above the water when bathing the baby.

*Research question two*

How does place of delivery influence neonatal umbilical cord management?

**Table 2. Place of delivery and neonatal umbilical cord management**

Variable	Response				
	SA f (%)	A f (%)	D f (%)	SD f (%)	Total f (%)
Redness of the skin around the cord as a sign of infection can be recognized by nurses in tertiary health care facilities.	115(15.4)	361(48.3)	105(14.0)	167(22.3)	748(100)
In TBAs centres, hand washing hygiene is rarely done before dressing of baby's cord stump.	83(11.1)	172(23.0)	274(36.6)	219(29.3)	748(100)
Lack of information on proper cord care makes its practice difficult in primary health centres found in rural areas.	284(38.0)	277(37.0)	94(12.6)	93(12.4)	748(100)
Proper cord care management can only be done in private health care facilities.	109(14.6)	441(59.0)	34(4.5)	164(21.9)	748(100)
Usage of cord clamp to tie baby's cord is not carried out when delivery takes place in a Church.	372(49.7)	71(9.5)	160(21.4)	145(19.4)	748(100)

The result as shown in Table 2, depict the opinions of respondents on the place of delivery on neonatal umbilical cord management. Out of 748 respondents, 115 (15.4 %) strongly agreed that redness of the skin around the cord as a sign of infection can on be recognized by nurses in tertiary health care facilities. Another 361 (48.3 %) of the respondents also agreed that nurses could easily recognize such sign of infection. While 105 (14.0 %) disagreed to it; 167 (22.3 %) strongly disagreed to it. Majority of the respondents, 274 (36.6 %), disagreed that in TBAs centres hand washing hygiene is rarely done before dressing of baby's cord stump. Another 284 (38.0 %) of the

respondents strongly agreed that lack of information on proper cord care, makes its practice difficult in primary health centres found in rural areas. Majority of respondents, 441 (59.0 %) agreed that proper cord care management can only be done in private health care facilities while 372 (49.7 %) strongly agreed that usage of cord clamp to tie baby's cord is not carried out when delivery takes place in a Church/prayer houses.

*Research question three*

To what extent does maternal knowledge of cord care influence the choice of substance used on neonatal umbilical cord management?

**Table 3. Maternal knowledge of cord care and neonatal umbilical cord management by nursing mothers**

Variable	Response					Total f (%)
	SA f (%)	A f (%)	D f (%)	SD f (%)		
Mothers who attend antenatal care have enough knowledge to practice cord care on their own.	309(41.3)	379(50.7)	31(4.1)	29(3.9)		748(100)
A mother who does not have any idea about cord care would accept any kind of cord care practices.	199(26.6)	277(37.0)	183(24.5)	89(11.9)		748(100)
Improper cord care can only be identified by mothers who have adequate knowledge of it.	318(42.5)	206(27.5)	108(14.4)	166(22.2)		748(100)
Mother with low knowledge of cord care often accept the use of cow dung to treat the cord of their baby.	284(38.0)	331(44.2)	56(7.5)	77(10.3)		748(100)
Tying the cord stump with hair thread is practiced by mothers due to ignorance on proper cord care	192(25.7)	282(37.7)	102(13.6)	172(23.0)		748(100)

The information Table 3 above shows the opinions of the respondents on maternal knowledge of cord care on management of neonatal umbilical cord. Of the 748 respondents, 309 (41.3%) strongly agreed that mothers who attend antenatal care have adequate knowledge and skill to practice cord care unaided. Another 379 (50.7%) equally agreed to the assertion. While 31 (4.1%) disagreed with it; 29 (3.9%) strongly disagreed. Good number of the respondents, 277 (37.0%) agreed that mothers who do not have any idea about cord care would accept any kind of cord care practices. In another development, 318 (42.5%) of the respondents strongly agreed that improper cord care are noticeable mostly among mothers who have adequate knowledge of it. 331 (44.2%) agreed that mothers with low knowledge of cord care would accept the use of cow dung to treat the cord of their baby; while 282 (37.7%) agreed that tying the cord stump with hair thread is common among mothers who do not have a clue about proper cord care practices.

### Discussion of findings

The first findings of this study show a positive influence of maternal education level on neonatal umbilical cord management. Most of the respondents had acknowledged that maternal education has a very high influence on neonatal cord management by nursing mothers in Calabar Education Zone, Cross River State. It was discovered that majority of the respondents believe that mostly educated mothers would refuse to apply cow dung on the baby's umbilical stump to prevent bleeding when it falls off. In a related research carried out by Eneji et al (2010), the scholars opined in several of their reviews that the level of mothers' education influenced the practice of clean cord care. In an attempt to establish how maternal education affects umbilical cord care among nursing mothers, Kelly (2011) posited that clean cord care was found among highly educated mothers aged 35 and above. According to Tuladhar (2010), a higher level of educational attainment has a positive effect on the decision to practice clean cord care. Therefore, maternal education level has been found to have a direct positive influence on

neonatal umbilical cord management by nursing mothers in Calabar Education Zone of Cross River State in particular.

The second finding of this study shows a positive influence of place of delivery on neonatal umbilical cord management. It was confirmed by majority of the respondents that lack of information on proper cord care makes its practice difficult in primary health centres found in rural areas. According to Osaghae and Amuabunos (2010), the sites of antenatal care concerning the levels of education of the mothers showed that out of the 18 mothers with either Primary Education or none, (61.1%) had ANC in un-orthodox facilities while (38.9%) had care in Health facilities. Women with secondary education (33.3%) each used herb, spirit and mentholated substance. Lawn and Cousens (2004) reported that approximately four million global neonatal deaths occur annually, 98% occur in developing countries, predominantly at homes, where neonatal umbilical cord management was poor. In addition, Obuekwu and Obuekwu (2003) posited that in developing countries, most deliveries take place at home, often in unhygienic circumstances and untrained birth attendants conduct these deliveries where most traditional cord care practices are harmful.

The third finding of this study shows that the maternal knowledge of cord care affects the choice of substance used for neonatal umbilical cord management by nursing mothers. It was revealed that 37.7% of the respondents agreed that tying the cord stump with hair thread is common among mothers who do not have a clue about proper cord care practices. This finding supports the study of Andrew and Dala (2011) who reported that, in Bangladesh more than 80% of women delivered at the home of which in 6% of cases, mothers preferred to use razor blade from a clean-delivery kit (CDK) to cut the cord. In 90% of cases, the blades used were from other unknown sources; in 4% of cases, other instruments such as bamboo strips and scissors were used to cut the cord. In addition, Mohamed (2010) discovered that the knowledge of mothers was inadequate in areas of umbilical cord care. According to Green,

Udoh and Peter (2006), increased awareness of standard cord care practices is needed in South West Zone of Nigeria, 11.9% of 328 mothers with newborns reported knowledge of cord care during antenatal visits. This also agrees with the findings of this study, where few mothers who attended antenatal care were found to possess knowledge and skills in umbilical cord management.

### **Conclusion**

Based the findings of this research, it is concluded that social variables such as maternal education, place of delivery, and maternal knowledge of cord care influence umbilical cord management among nursing mothers in Calabar Education Zone of Cross River State. The impact of maternal education level, place of delivery, and maternal knowledge of cord care are all the major social factors to which nursing mothers and health care workers must pay due attention, to ensure effective delivery of quality neonatal care, especially because that stage of life is delicate and critical.

### **Recommendations**

Based on the conclusion, the study recommendations are as follows;

1. Vagarious public campaign on neonatal umbilical cord management be carried out by health workers and other health advocacy groups targeting health posts and antenatal care centres in Calabar Education Zone, with nursing/expectant mothers in focus.
2. All tiers of government should work hard by enacting and implementing policies to improve mother/child education.
3. Government should establish be volunteer health workforce or partner/synergise with other health advocacy groups, especially in rural areas should visit and educate nursing mothers on umbilical cord management, especially in TBA prone areas.

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