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Umbilical Cord Care Practices among Postnatal Mothers in Rivers State, Nigeria

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Abstract

This study assessed the knowledge and practices of umbilical cord care among postnatal mothers attending the Model Primary Healthcare Centre, Ozuoba, Rivers State, Nigeria. A cross-sectional descriptive design was adopted, and data were collected from 232 postnatal mothers selected through purposive sampling. A validated self-structured questionnaire was used to obtain information on demographic characteristics, cord care knowledge, practices, and influencing factors. Data were analyzed using descriptive statistics. The results revealed that most respondents (61.6%) were aged 20–25 years, 57.8% were married, and 49.5% had tertiary education. Over half (53%) delivered in a health facility, while 31.5% delivered at traditional birth attendant (TBA) centers. Regarding umbilical cord care, 76.7% of mothers used methylated spirit and cotton wool for cleaning, whereas 40% used chlorhexidine gel. However, some respondents still engaged in unsafe traditional practices such as applying toothpaste (15.9%), Vaseline (17.6%), herbs (13.8%), and breast milk (12.5%) on the cord stump. Hand hygiene was relatively good, with 67.7% always washing their hands before and after cord care. The findings indicate that although most mothers demonstrated adequate cord care knowledge, harmful traditional practices remain prevalent due to cultural beliefs and limited awareness of recommended antiseptics. The study concludes that continuous maternal education and increased access to chlorhexidine gel are essential to improving cord care outcomes and preventing neonatal infections. Strengthening antenatal and postnatal health education programs at the community level will help reduce preventable neonatal morbidity and mortality in Rivers State and similar settings.

How to Cite this Article

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1. Introduction

The umbilical cord plays a vital role in sustaining fetal life, but after birth, it becomes a potential site for infection if not properly managed. Umbilical cord care, therefore, remains a crucial component of neonatal health, as improper care practices can lead to omphalitis, sepsis, and neonatal death (World Health Organization [WHO], 2024). Globally, neonatal infections contribute substantially to newborn mortality, accounting for an estimated 30% of neonatal deaths in low- and middle-income countries (United Nations [Nigeria], 2024). In Nigeria, the neonatal mortality rate remains high at approximately 33 deaths per 1,000 live births despite various public health interventions (Knoema, 2024). One of the leading preventable causes of these deaths is infection resulting from poor cord care practices (National Bureau of Statistics [NBS] & United Nations Children's Fund [UNICEF], 2022).

Umbilical cord infection often results from the application of harmful traditional substances such as ash, toothpaste, herbs, cow dung, and breast milk to the cord stump (Merga et al., 2022; Duru et al., 2023). Such practices are deeply rooted in cultural beliefs and myths surrounding neonatal care, particularly in rural and semi-urban communities across Nigeria. Studies have shown that traditional cord care methods persist despite awareness campaigns and the introduction of antiseptic cord care guidelines (Udosen, Olaoye, & Esienumoh, 2019; Ango et al., 2021). For example, Duru et al. (2023) reported that cultural influences and social norms continue to drive the use of unsafe substances on the umbilical stump in Bayelsa State. Similarly, Mohammed et al. (2020) found that many mothers in Plateau State had poor knowledge of evidence-based cord care practices, with a significant proportion favoring traditional remedies over medically recommended agents.

The World Health Organization recommends the use of 7.1% chlorhexidine digluconate gel for umbilical cord care in settings with high neonatal mortality (WHO, 2024). Evidence from clinical trials and field studies has shown that chlorhexidine application significantly reduces cord infection and neonatal sepsis compared with dry cord care or methylated spirit use (Okpaleke, Ndikom, & Bulama, 2019; Israel et al., 2023). However, adoption of chlorhexidine gel remains inconsistent in Nigeria due to limited awareness, accessibility challenges, and misconceptions among postnatal mothers (Israel et al., 2023). Similar gaps in knowledge and practice have been observed in other African countries such as Ethiopia and Kenya, where

studies found that inadequate maternal education, rural residence, and sociocultural influences were key determinants of harmful cord care practices (Dessalegn et al., 2022; Kyololo & Kipkoech, 2023).

The postpartum period provides an essential window for health education and behavior change among mothers. Mothers' knowledge and practice of umbilical cord care are influenced by factors such as educational status, antenatal care attendance, place of delivery, and exposure to health information (Ango et al., 2021; Merga et al., 2022). Similar findings were reported by Ene-Peter and Orukwowu (2022), who noted that maternal education and occupation significantly influenced breastfeeding and new born care practices among working-class mothers in Rivers State. Their study emphasizes the role of health workers in promoting correct infant care behaviours, which also applies to safe umbilical cord care practices. Effective nurse leadership has been identified as central to improving maternal and neonatal outcomes (Orukwowu, 2022). Nurse-led health education ensures consistent information delivery and supports behavioral change among postnatal mothers. While national policies emphasize the promotion of hygienic cord care practices to reduce neonatal morbidity and mortality, there is limited localized data from parts of southern Nigeria, particularly Rivers State, on maternal adherence to WHO-recommended guidelines. Understanding the current knowledge and practices of postnatal mothers in this region is critical for designing targeted interventions that can improve neonatal outcomes and contribute to achieving Sustainable Development Goal 3—ensuring good health and well-being for all (United Nations [Nigeria], 2024).

This study therefore aims to assess the knowledge and practices of umbilical cord care among postnatal mothers attending the Model Primary Healthcare Centre, Ozuoba, Rivers State. Findings from this research will provide evidence-based insights into the prevailing cord care behaviors, identify gaps in maternal knowledge, and inform future public health strategies to promote safe cord care and reduce neonatal infections in the state and beyond.

2. Methodology

3.1 Research Design

This study employed a cross-sectional descriptive design to evaluate the knowledge and practices of umbilical cord care among postnatal mothers attending the Model Primary Healthcare Centre, Ozuoba, in Rivers State. This design was deemed suitable because it enables data collection from a defined population at a single point in time, providing an immediate overview of the mothers' knowledge, behaviors, and the factors that influence their cord care practices.

3.2 Area of Study

The research was carried out at the Model Primary Health Centre (PHC), Ozuoba, situated in the Obio/Akpor Local Government Area of Rivers State, Nigeria. Established on January 1, 2010, the centre operates 24 hours daily and is officially licensed by the Nigerian Ministry of Health under facility code 32/15/1/1/1/0005, with registration as a Primary Health Care Centre. The PHC has a 15-bed capacity and provides a variety of services, including antenatal care (ANC), immunization, HIV/AIDS management, treatment of non-communicable diseases, family planning, nutrition counseling, health education, and community outreach programs. Additionally, the facility houses an onsite laboratory and pharmacy, enhancing its ability to deliver comprehensive healthcare services to the surrounding community.

3.3 Target Population

The target population consisted of **postnatal mothers** who had delivered within the last **1 to 6 weeks**, as well as mothers bringing their infants for immunization at the Model Primary Healthcare Centre, Ozuoba. According to records obtained from the centre, the total population was estimated at **550 women**.

Inclusion Criteria

- Postnatal mothers who delivered within the last 1 to 6 weeks.
- Mothers attending the PHC for postnatal check-up or infant immunization.
- Mothers within the reproductive age range of **15–49 years**.
- Mothers who could communicate in **English** or **Pidgin English**.

Exclusion Criteria

- Women outside the postnatal period.
- Mothers not bringing their children for immunization.
- Mothers unable to communicate in English or Pidgin English.
- Women outside the reproductive age range of 15–49 years.

3.4 Sample Size and Sampling Technique

Sample Size Determination

The sample size was calculated using the **Taro Yamane formula (1967)**:

$$n = \frac{N}{1 + N(e)^2}$$

Where:

N=550N = 550N=550 (population size)
e=0.05e = 0.05e=0.05 (level of precision)

$$n = \frac{550}{1 + 550(0.05)^2} = \frac{550}{1 + 1.375} = \frac{550}{2.375} = 231.6$$

Thus, the sample size was 232 respondents.

Sampling Technique
A **purposive sampling technique** was employed to select participants. This technique was deemed appropriate because it allowed the researcher to intentionally select postnatal mothers who met the inclusion criteria and could provide relevant information for the study objectives.

3.5 Instrument for Data Collection
Data were collected using a **self-structured questionnaire** developed by the researcher based on the study objectives. The questionnaire consisted of four sections:

- **Section A:** Demographic information of respondents.
- **Section B:** Assessment of knowledge of umbilical cord care.
- **Section C:** Assessment of umbilical cord care practices.
- **Section D:** Factors influencing umbilical cord care practices.

Respondents were instructed to indicate their responses by ticking the appropriate options.

3.6 Validity of the Instrument
The questionnaire was submitted to the **research supervisor** and other experts in nursing science for face and content validation. They reviewed it for clarity, relevance, and alignment with the study objectives. Necessary modifications were made based on their feedback to ensure the instrument's validity.

3.7 Reliability of the Instrument
The reliability of the instrument was determined using the test–retest method. Twenty (20) copies of the questionnaire were administered to postnatal mothers at the Model Primary Healthcare Centre, Rumuigbo, who were not part of the study population. The responses were collected and analyzed using the Pearson Product Moment Correlation Coefficient (r) to determine the consistency of the instrument over time. The result confirmed that the instrument was reliable for data collection.

3.8 Method of Data Collection
Data collection was carried out using the validated self-structured questionnaire. Informed consent was obtained from each respondent before participation. Questionnaires were administered personally by the researcher, and the completed forms were retrieved immediately after completion to ensure a 100% response rate.

3.9 Method of Data Analysis
Collected data were entered and analyzed using IBM SPSS Statistics version 23 after initial organization in Microsoft Excel 2016. Descriptive statistics such as frequency, percentage, and mean were used to summarize the data. Results were presented in tables for clarity and ease of interpretation.

3.10 Ethical Consideration
Ethical approval was obtained from the Project Committee of the Department of Nursing Sciences, Rivers State University. Permission to conduct the study was also granted by the management of the Model Primary Healthcare Centre, Ozuoba. Informed consent was obtained from all participants after the purpose of the study was explained. Participation was voluntary, and respondents were assured of anonymity and confidentiality. No participant was coerced to take part in the study, and all information collected was used solely for research purposes.

3. Results
3.1 Social Demographics of the Respondents
Table 1 shows that 25% of study respondents are aged 15-19, 61.6% are aged 20 25, 13.3% are aged 30 and above. 32.8% reside in rural areas while 67.2% reside in urban areas, 42.2% are single, 57.8% are married. 13.8% have primary education, 32.8% have secondary education, 49.5% have tertiary education, and 3.9% have received no formal education. 63.4% have businesses, 19.8% are housewives, 16.8% are employed. 31.5% have one child, 68.5% have 2 children and above. 11.6% did not attend antenatal clinic during last pregnancy, 16.8% made 1-2 antenatal visits during last pregnancy, 50.8% made 3-4 visits, and 20.8% made above 4 visits. 53% delivered in the health facility, 15.5% had home delivery, and 31.5% delivered at a traditional birth attendant (TBA) Centre.

Table 1: Social Demographics of the Respondents (n = 232)

Variable	Category	Frequency (n)	Percentage (%)
Age (Years)	15–19	58	25.0
	20–25	143	61.6
	30 and above	31	13.3
Residence	Rural	76	32.8
	Urban	156	67.2
Marital Status	Single	98	42.2
	Married	134	57.8
Level of Education	No formal education	9	3.9
	Primary education	32	13.8
	Secondary education	76	32.8
	Tertiary education	115	49.5
Occupation	Business	147	63.4
	Housewife	46	19.8
	Employed	39	16.8
Number of Children	One	73	31.5
	Two or more	159	68.5
Antenatal Visits (Last Pregnancy)	None	27	11.6
	1–2 visits	39	16.8
	3–4 visits	118	50.8
	Above 4 visits	48	20.8
Place of Delivery	Health facility	123	53.0
	Home	36	15.5
	Traditional Birth Attendant (TBA) Centre	73	31.5

3.2 Practice of Umbilical Cord Care among Postnatal Mothers

Table 2A above shows that 75.9% of respondents clean their baby's cord after bathing the baby, and 24.1% after changing baby's diapers. 17.7% use hot water in cleaning the baby's cord, 76.7% use cotton wool with methylated spirit, while 5.6% use indicated to using other substances.40% apply chlorhexidine gel after cord cleaning, 15.9% apply toothpaste, 17.6% apply Vaseline, 12.5% apply breastmilk, and 13.8% apply herbs. 79.7% clean the cord from base and surrounding skin at the same time, and 20.3% clean cord from base before surrounding skin or clean the cord only. For washing hands before and after cord care 67.7% responded always and 32.2% responded sometimes.

Table 2B shows that 45.7% of respondents Wash their hands with soap and water and drying hands with a clean towel, 29.3% Wash their with soap and water and drying hands on their wrapper, 11.6% wash their hands with only water while 13.4 utilize other means. When asked if baby diaper should be placed under the umbilical cord stump 72.8% strongly agree, 22.8% agree and 4.4% disagree. When asked how to keep the umbilical cord dry 57.8% leave the cord exposed to air, 3% use a fan, 15.5% use a cloth to bandage and 36.6% do nothing.

Table 2A: Practice of Umbilical Cord Care among Postnatal Mothers Attending Model Primary Healthcare Centre, Ozuoba

Variables	Frequency (n=232)	Percentage (%)
How do you clean your baby's cord?		
After bathing the baby	176	75.9
After changing baby's diapers	56	24.1
None	0	
What do you use in cleaning your baby's cord?		
Hot water	41	17.7
Cotton wool with methylated sprit	178	76.7
Others	13	5.6
What do you apply on the cord after cleaning?		
Chlorhexidine gel	93	40
Toothpaste	37	15.9
Vaseline	41	17.6
Breastmilk	29	12,5
Herbs	32	13.8
What cord cleaning technique do you use?		
Clean cord from the base and surrounding skin at the same time	185	79.7
Clean cord from base before surrounding skin		
Clean cord stump only	47	20.3
How often do you wash your hands before and after cord care?		
Always	157	67.7
Sometimes	75	32.2
Never	0	

Source: Field Survey

Table 2B: Practice of Umbilical Cord Care among Postnatal Mothers Attending Model Primary Healthcare Centre, Ozuoba

Variables	Frequency (n=232)	Percentage (%)
If yes, how do you wash your hands?		
Wash with soap and water and drying hands with a clean towel	106	45.7
Wash with soap and water and drying hands on my wrapper	68	29.3
Wash hand with only water	27	11.6
Others	31	13.4
Do you place baby's diaper below Umbilical cord stump?		
Strongly Agree	169	72.8
Agree	53	22.8
Disagree	10	4.4
Strongly disagree	0	
How do you keep the umbilical cord area dry?		
Expose it to air	134	57.8
Use a fan	7	3
Use a cloth to bandage	36	15.5
Nothing	85	36.6

Source: Field Survey

4. Discussion

This study assessed the knowledge and practice of umbilical cord care among postnatal mothers attending the Model Primary Healthcare Centre, Ozuoba, Rivers State, Nigeria. The findings revealed that most respondents demonstrated a fair level of awareness and practice of safe umbilical cord care, although the continued use of traditional and unhygienic substances such as toothpaste, herbs, and breast milk remains a concern. These findings align with earlier studies in sub-Saharan Africa, which highlight the persistence of mixed practices among mothers due to cultural beliefs, inadequate health education, and inconsistent access to modern healthcare resources (Dessalegn et al., 2022; Ndomondo et al., 2022).

The socio-demographic data indicated that a majority of respondents (61.6%) were within the age range of 20–25 years, mostly married, and had at least secondary or tertiary education. Education has been shown to influence maternal knowledge and adoption of safe neonatal care practices (Merga et al., 2022). The relatively high educational attainment among respondents may explain the good level of cord hygiene observed, such as the use of methylated spirit (76.7%) and handwashing before and after cord care (67.7%). This agrees with Ene-Peter and Orukwowu (2022), who found that although most educated working-class mothers in Rivers State demonstrated good knowledge of breastfeeding, socio-economic and occupational barriers limited their adherence to recommended practices, paralleling similar constraints in neonatal cord-care compliance. However, the finding that only 40% used chlorhexidine gel—the WHO-recommended antiseptic for umbilical cord care—indicates limited availability or awareness of its benefits (Painter et al., 2024; Shwe et al., 2021).

The study also revealed that 53% of the respondents delivered in health facilities, while 31.5% delivered at traditional birth attendant (TBA) centers. The involvement of TBAs in delivery increases the likelihood of unsafe practices, as traditional attendants often apply harmful substances to the cord stump (Merga et al., 2022). Similar patterns were reported by Ndomondo et al. (2022) in Tanzania and Dessalegn et al. (2022) in Ethiopia, where community-based deliveries were associated with poor cord care practices and higher risks of neonatal infections.

Despite widespread awareness of the importance of hygiene, misconceptions persist. Approximately 15.9% of mothers reported applying toothpaste, 12.5% applied breast milk, and 13.8% applied herbs to the cord stump—substances known to increase the risk of omphalitis and neonatal sepsis (Painter et al., 2024). These practices highlight the ongoing influence of traditional beliefs and the need for intensified community-based health education programs. Consistent with this, Ene-Peter and Orukwowu (2022) emphasized that targeted community health education and family support systems are essential in correcting misconceptions that undermine safe infant-care practices in Rivers State. Merga et al. (2022) similarly emphasized that harmful traditional practices remain deeply rooted in maternal care, particularly in low-resource settings.

Antenatal care attendance appeared to positively influence knowledge and practice, as 71.6% of respondents attended at least three ANC visits during pregnancy. Consistent with findings by Dessalegn et al. (2022), mothers who had more ANC visits were more likely to receive education on cord care, contributing to safer postnatal practices. Moreover, the urban residence of 67.2% of respondents likely enhanced access to healthcare information and professional guidance compared to their rural counterparts (Negrini et al., 2021).

The study reinforces global and national health concerns regarding neonatal mortality. According to Knoema (2024), Nigeria's neonatal mortality rate remains among the highest worldwide, largely due to preventable infections such as omphalitis. Strengthening health education, promoting the use of chlorhexidine gel, and ensuring skilled birth attendance can significantly reduce neonatal morbidity and mortality.

In conclusion, while most mothers in this study demonstrated satisfactory cord care practices, unsafe traditional methods persist, particularly among mothers who delivered outside health facilities. Continuous maternal education through ANC, postnatal follow-up, and community sensitization programs is vital to achieving safer umbilical cord care and reducing preventable neonatal deaths in Rivers State and beyond. As Orukwowu (2022) observed in his study on family roles in health promotion, families serve as primary support systems influencing maternal adherence to hygiene-related health behaviours.

5. Conclusion

The study revealed that postnatal mothers attending the Model Primary Healthcare Centre, Ozuoba, generally possess fair knowledge and practice of umbilical cord care. Most mothers adhered to safe hygiene practices such as cleaning the cord with methylated spirit and washing hands before and after cord care. However, the continued use of traditional and potentially harmful substances, including herbs, toothpaste, breast milk, and Vaseline, indicates that unsafe practices remain a significant concern. Factors such as place of delivery, antenatal care attendance, maternal education, and urban residence influenced cord care practices, with mothers delivering in health facilities and attending regular ANC visits demonstrating better adherence to recommended guidelines. These findings underscore the need for continuous health education and sensitization programs targeting both mothers and caregivers, particularly those delivering at home or with traditional birth attendants. Promoting the use of chlorhexidine gel, alongside reinforcing proper hygiene techniques, is crucial for preventing neonatal infections and reducing morbidity and mortality. Strengthening postnatal follow-up and community-based interventions will support safer cord care practices, ultimately contributing to improved neonatal health outcomes in Rivers State and comparable low-resource settings.

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