



KNOWLEDGE AND PERCEPTION OF UMBILICAL CORD CARE AMONG NURSING MOTHERS ATTENDING THREE SELECTED PRIMARY HEALTHCARE CENTRES IN IBADAN, OYO STATE, NIGERIA

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ABSTRACT: *Umbilical Cord Care (UCC) practices are essential to prevent the newborn from the risk of infections. It has been discovered that nursing mothers are not practicing UCC effectively due to lack of adequate knowledge and poor perception. Therefore, this study assessed the level of knowledge and perception of mothers on UCC in selected Primary Healthcare Centres (PHC) in Ibadan, Oyo State, Nigeria. A non-experimental cross-sectional survey design was used. A self-structured and validated Questionnaire with Cronbach's Alpha Coefficient reliability of 0.76 was administered to 240 women, aged 16-49, in three randomly selected PHCs. Findings shows 82% had high knowledge and 42.3% had poor perception of UCC. Also, there was a significant relationship between marital status and knowledge of UCC ($p < 0.005$). The study shows high level of knowledge of UCC among nursing mothers in selected PHCs in Ibadan, Oyo State. Hence, UCC awareness should be intensified among women and their significant others.*

KEYWORDS: Knowledge of Umbilical Cord Care, Nursing Mothers, Perception, Umbilical Cord Care.



STATEMENT OF PROBLEM

Proper newborn care, including maintaining warmth and preventing umbilical cord infections, is essential for infant survival. However, many mothers lack adequate knowledge of UCC, contributing to neonatal mortality. Several studies highlighted the prevalence of neonatal infections. For instance, in Port Harcourt, omphalitis constitutes 10% of neonatal admissions and 30% of neonatal deaths. In Ibadan, it constitutes about 18% of neonatal deaths, while in Calabar, 49% of neonatal deaths were linked to omphalitis. In Nigeria, cases of umbilical cord infections are under-documented and under-reported, but Neonatal deaths in Nigeria are about 241,000 every year, making it the highest neonatal death rate in Africa, of which about 600,000 infants die of neonatal tetanus annually. Global annual neonatal deaths constitute about 4 million (31%), and about 25% of these deaths are due to umbilical infection. Therefore, this study assessed the knowledge and perception of nursing mothers on umbilical cord care in three selected PHCs in Oyo State, Nigeria.

Aim of the Study

This study assessed the knowledge and perception to umbilical cord care among nursing mothers attending three selected PHCs in Ibadan, Oyo state, Nigeria.

Significance of the Study

This study examines the knowledge and perception of UCC among nursing mothers in three PHCs in Ibadan, Oyo State. The findings of this study may reveal the level of knowledge and perception of umbilical cord care among nursing mothers. The study may also identify the rationale behind traditional cord care practices and how to effectively address them while promoting safer alternatives. However, this result would further justify the country's need for evidence-based practices to improve infant health outcomes. This explores the umbilical cord care practices and the findings may be useful to traditional birth attendants, midwives, other health care professionals, government bodies, and non-governmental bodies, thereby reducing neonatal mortality and morbidity in the country. Furthermore, the findings may contribute new information that may be needed for future research or practice of proper cord care that is essential for preventing infections and contributing to overall infant health and survival.

REVIEW OF LITERATURE

The umbilical cord is considered both the physical and emotional attachment between mother and foetus. This structure allows for the transfer of oxygen and nutrients from the maternal circulation into foetal circulation while simultaneously removing waste products from fetal circulation to be eliminated maternally. Thus, UCC is essential for infection prevention and control. Cord care is the series of steps applied in handling the umbilical cord after delivery of the newborn, which takes some time (approximately 1-2 weeks) before the stump dries up and falls off. The most commonly used cord cleansing substance is methylated spirit. This was reported by Akinyemi et al (2018), where most respondents used it due to its ability to keep the cord stump clean, dry, and promote quick cord separation.

Knowledge is power; ignorance is deadly. Knowledge is the bedrock to effective and



adequate umbilical cord care. Nevertheless, most mothers lack sufficient knowledge of UCC, which makes it a matter of urgency. Ndikom et al. (2020) found deficiencies in both knowledge and UCC practices among mothers. As reported by Nwonwu et al (2017), 11.7% had low knowledge of proper material (chlorhexidine) for umbilical cord care, while 81% had poor practice of the use of correct material among mothers. Furthermore, as penned by Osuchukwu et al (2017), 44.7% of nursing mothers had poor knowledge of standard cord care. Ndikom and Oluwatosin (2020) in their study done on the Umbilical Cord Care Knowledge and Practices among Mothers attending Selected Primary Health Care Centres in Ibadan, Nigeria, 48.1% of the respondents had good knowledge of Umbilical Cord Care.

Several studies have also shown poor perception of UCC among nursing mothers. For instance, Holakouee-Naeini et al (2019) in their study reported that the majority of the respondents, 270 (55.9%), decided on the choice of some materials to ward off evil spirits and hasten cord separation. Other reasons given were to prevent “Ibiookop” by 185 (38.3%) of the respondents, 80 (16.6%) to prevent neonatal tetanus “odon”, 61 (12.6%) to prevent infection, while 56 (11.6%) used the various substances due to pressure from family members. Therefore, there is a need to assess the level of knowledge of umbilical cord care among nursing mothers attending selected PHCs in Ibadan, Oyo State, Nigeria.

Theoretical Framework

The health belief model (HBM) is a psychological health behavior change model developed to explain and predict health-related behaviors, particularly regarding the uptake of health services. The health belief model suggests that people's beliefs about health problems, perceived benefits of action and barriers to action, and self-efficacy explain engagement (or lack of engagement) in health-promoting behavior. A stimulus, or cue to action, must also be present to trigger the health- promoting behavior.

- **Perceived severity**

Perceived severity refers to the subjective assessment of the severity of a health problem and its potential consequences.

- **Perceived susceptibility**

Perceived susceptibility refers to the subjective assessment of the risk of developing a health problem. The health belief model predicts that individuals who perceive that they are susceptible to a particular health problem will engage in behaviors to reduce their risk of developing the health problem. Individuals with low perceived susceptibility may deny that they are at risk for contracting a particular illness.

- **Perceived benefits**

Health-related behaviours are also influenced by the perceived benefits of taking action. Perceived benefits refer to an individual's assessment of the value or efficacy of engaging in a health- promoting behavior to decrease the risk of disease.



- **Perceived barriers**

Health-related behaviors are also a function of perceived barriers to taking action. Perceived barriers refer to an individual's assessment of the obstacles to behavior change.

- **Modifying variables**

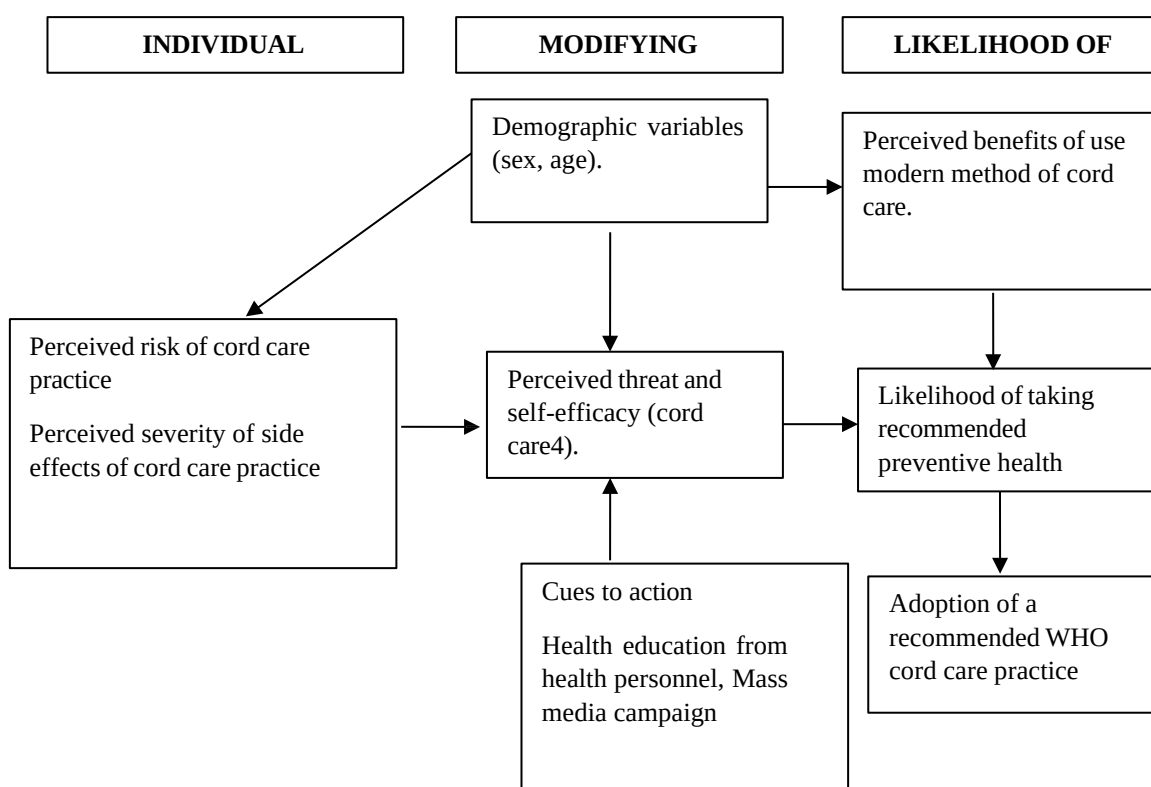
Individual characteristics, include demographic, psychosocial, and structural variables, can affect perceptions (i.e., perceived seriousness, susceptibility, benefits, and barriers) of health-related behaviors.

- **Cues to action**

The health belief model posits that a cue, or trigger, is necessary for prompting engagement in health-promoting behaviors.

- **Self-efficacy**

Self-efficacy was added to the four components of the health belief model (i.e., perceived susceptibility, seriousness, benefits, and barriers) in 1988. Self-efficacy refers to an individual's perception of his or her competence to successfully perform a behavior. Self-efficacy was added to the health belief model in an attempt to better explain individual differences in health behaviors.



Conceptual Framework adapted from Health Belief Model (Rosenstock, 1950)



METHODS RESEARCH DESIGN

The study utilized a descriptive cross-sectional design to assess the knowledge and perception of nursing mothers to Umbilical Cord Care (UCC).

The study Settings

The study was conducted in three PHCs in Ibadan Metropolis, spanning three Local Government Areas namely: Oniyanrin Primary Health Care Centre, Oniyanrin, Ibadan, Nigeria, Sango Primary Health Care Center, Sango, Ibadan and Agbongbon Health Centre, Agbongbon, Ibadan.

Oniyanrin Primary Health Care Centre, Oniyanrin, Ibadan, Nigeria

Oniyanrin Primary Health Center is run by the Ibadan North West LGA It is a primary-level facility staffed mainly by five nurse-midwives. The facility is one of the few in Ibadan that has a community liaison officer on its staff, thereby making it easy for service providers to reach out to the community. This clinic is open Monday through Friday from 8 am to 4 pm.

Sango Primary Health Care Center, Sango, Ibadan

Sango/Patako Primary Health Care Centre, Sango, Ibadan by the Ibadan North LGA It is a primary-level facility staffed by a Staff Nurse, Eight (8) Community Health Officers, (CHO) and Three (3) Community Health Workers, (CHEW) The Clinic is open from Monday to Friday from 8:00am to 4:00 pm. They treat cases such as Malaria, Typhoid and other cases that can be handled at the Primary health Level.

Agbongbon Health Centre, Agbongbon, Ibadan

Agbongbon Primary Health Care Centre, Agbongbon, Ibadan, by the Ibadan South East LGA It is a primary-level facility staffed by A Chief Nursing Officer (CNO), a Staff Nurse, and three (3) Community Health Workers (CHEW). The Clinic is open from Monday to Friday from 8:00 am to 4:00 pm. The cases mostly attended to at the clinic are cases of Typhoid and diarrhea.

Study Population

The study's populations were nursing mothers who attended the Infant Welfare Clinic at selected Primary Health Care in Ibadan, namely: Oniyanrin Primary Health Care Centre, Oniyanrin, Ibadan, Nigeria, Sango Primary Health Care Center, Sango, Ibadan, and Okeadu Health Centre, Okeadu, Ibadan.

Inclusive and exclusive criteria

The participants are nursing mothers of neonates between 0-28 days who attend the selected Primary Healthcare Centre, while nursing mothers of neonates above the stipulated age were excluded.



Sampling Size

Taro Yamane's formula was used to determine the sample size of 494 nursing mothers in the three selected PHCs (Agbongbon – 223, Sango – 172, and Oniyanrin – 93).

Sampling Technique

A purposive sampling technique was used to select the required sample size of respondents among the nursing mothers at the Infant Welfare Clinic at the selected Primary Health Care Centre.

Data Collection Tools

The instrument for data collection was a self-constructed and validated questionnaire used to collect information on the knowledge and perception of participants on UCC.

Validity of Research

The questionnaire was drafted after an extensive review of the subject matter, and the instrument was reviewed severally Contributions from lecturers and supervisors in the Department of Nursing Science, Afe Babalola University, Nigeria, were effected accordingly. The instrument was translated to the Yoruba language and back to the English language in order not to lose the meaning and the purpose of the instrument. All RAs were well trained to handle the translated instruments alongside the English version without loss of value and message to maintain the construct validity of the instruments.

Reliability of Research

The research supervisor and other experts examined the research instrument to ensure that the instrument measured the objectives of the Study. The questionnaire was also presented to the analyst for clarification and criticism to make necessary corrections and give it face validity.. The Cronbach's alpha Coefficient's reliability result was 0.76.

Data Collection Technique

After the review of previous literature, a questionnaire was used to obtain information from respondents. The research questions were simple, straightforward, and collected by the researcher herself. The researcher spent six (6) days collecting the information.

The questionnaire was distributed to 240 respondents and collected immediately. The respondents were assured of confidentiality,

Measurement of variables

The variables measured were the Knowledge of umbilical cord care, and Perception to umbilical cord care. The questionnaire consists of three sections (Sections A-C); socio-demographic characteristics (section A), knowledge assessment (section B), and perception of nursing mothers to umbilical cord care (section C).

A self-structured and validated questionnaire was used to elicit information on knowledge of umbilical cord care among the nursing mothers. The correct answer attracts one (1) mark while the incorrect answer attracts zero (0). The higher the score, the greater the level of



knowledge of umbilical cord care. The higher score signifies good knowledge while the lower score implies poor

knowledge. The scores were classified into three categories; 75% and above was good knowledge, 50%-74% was average knowledge, and 10%-49% was low knowledge.

This section contains items used to elicit information about perception of nursing mothers to umbilical cord care. It was measured using a 4-point Likert scale: Strongly Agree (SA), Agree (A), Disagree (D), and Strongly Disagree (SD). The scores were categorised as SA = 4, A = 3, D = 2, and SD = 1. The higher the score the stronger the perception. The scores were categorised into two; score above 50% was good perception, while below 50% was poor perception.

Statistical Analysis

Data were analyzed using descriptive statistics, and the results were represented with tables, frequency, and percentage. The statistical inference was analyzed with the Statistical Package for Social Science (SPSS) version 25.

Ethical Consideration

Ethical clearance was obtained from the Afe Babalola University Health Research Ethical Committee. Permission was sought from the Ethical Committee of Oyo State Ministry of Health, and an introductory letter to the head of the Primary Health Care facilities to be used for the research work was obtained from the Afe Babalola University's School of Nursing Science. The respondents were assured of confidentiality, and they were informed that the study is purely for academic purposes and would not cause them any harm, and that they can opt out at any time.

RESULTS

Table 1: Respondents' Socio-demographic Characteristics

Variables	Frequency	Percentage
Age		
16-24	56	22.8
25-34	116	47.2
35-49	74	30.0
Total	246	100.0
Mean	82	
Standard Deviation	25.1	
Marital Status		
Married	172	69.9
Co-habiting	54	22.1
Single	8	3.2
Widow	8	3.2
Divorced	4	1.6
Total	246	100.0

**Education Background**

Primary	22	8.9
Secondary	70	28.5
NCE/OND	76	30.9
HND/BSC	72	29.3
MSC/PGDE	6	2.4
Total	246	100.0
Mean Score Standard Deviation Religion	49.2	

29.3

Christian	158	64.2
Muslim	84	34.2
Undecided	4	1.6
Total	246	100.0

Occupation

Unemployed	44	17.9
Civil Servant	64	26.0
Business woman	118	47.9
Farming	12	4.9
Housewife	8	3.3
Total	246	100.0

Ethnicity

Yoruba	210	85.4
Hausa	22	8.9
Igbo	4	1.6
Others	10	4.1
Total	246	100.0

Parity

1	88	35.8
2	78	31.7
3 and above	72	29.3
No response	8	3.2



Total	246	100.0
Mean Score	61.5	
Standard Deviation	31.4	

The result shows that the mean age of the respondents was 82 ± 25.1 . On marital status, 69% were married, 22% were co-habiting, 1.6 were divorced, while 3.2% were single and widow respectively. Furthermore, the mean for the educational attainment was 49.2 ± 29.3 . On parity, the mean was 61.5 ± 31.4 . 85.4% were of Yoruba, 8.9% were Hausa, 1.6% were Igbo while 4.1% were from other ethnicity.

Table 2: Respondents' level of knowledge of umbilical cord care

Variables	Knowledge		
	Knowledgeable	Not knowledgeable	Total
1. Unexposed after cord cleaning	136(55.3)	110(44.7)	246(100.0)
2. Discarding of spirit swap after use	228(92.7)	18(7.3)	246(100.0)
3. Stump cleaned after every diaper change	234(95.1)	12(4.9)	246(100.0)
4. Methylated spirit is always the best choice	234(95.1)	12(4.9)	246(100.0)
5. The umbilical cord should always be kept dry	196(79.7)	50(20.3)	246(100.0)
6. Chlorhexidine digluconate	188(76.4)	58(23.6)	246(100.0)

The results show that a greater percentage (82%) of mothers had good knowledge of umbilical cord care, while 18% had poor knowledge.

Table 3: Respondents' perception towards the choice of materials used for cord management

Variables	Frequency	Percentage
1. Wade off the evil spirit	94	38.2
2. Hasten cord separation	142	57.7
3. Traditional beliefs about childbirth birth such as myths and fear of neonatal death	10	4.1
Total	246	100.0

The result shows that 38.2% of mothers believe that their choice of umbilical cord care materials wades off evil spirits, 57.7% perceived it hastens cord separation, while only 4.1% believe that it is traditional, such as myths and fear of neonatal death.



DISCUSSION

This section synergized the results of the study in line with preceding findings in the literature. On age, the study revealed that about one-half (47.2%) of the respondents fall between the range of 21 to 30 years that's understandable because the population in Ibadan is youthful. Furthermore, a smaller percentage (30.1%) are within the age of 35-49 years. This is in tandem with Afolaranmi, et al, (2018) which posited that the mean age of the mothers in the study was 275 ± 6 years with

majority (75.6%) being 30 years and below. Also, (Umar et al, 2021) posited that majority (60.3%) of their study population were aged 20-29 years.

The result of this study shows from the table that majority, 86 (69.9%) of the respondents were married while a small percentage, 27 (22.0%) were co-habiting with their partner. A few, 4 (3.3%) were single, a very small percentage 4 (3.3%) were widows while a few, 2 (1.6%) of the respondents were divorced. This result is related to that of Afolaranmi, et al, (2018). Their study was conducted among mothers, and a larger percentage of their respondents 29.0 (89.5%) were married; however, 21 (6.5%) were single mothers. Another study by (Umar et al, 2021) revealed that most (98.3%) of the respondents were married which corroborates with the findings of this study.

Furthermore, this study result shows the educational statistics of the respondents with a few of 8.9% having primary school certification. Minority, 35 (28.5%) have secondary school certification, a slight percentage below average 38 (30.9%) were NCE/OND holders. Furthermore, minority, 36 (29.3%) of the respondents were HND/BSC holders while a few, 3 (2.4%) were MSC/PGDE certificate holders. This finding negates that of Afolaranmi, et al, (2018) which reiterated that the highest educational attainments of the respondents cut across all levels with those with non-formal education numbering 112 (35.0%) and tertiary level of education accounting for 67 (20.6%) of the mothers. A similar study by Umar et al (2021) also revealed that the respondents who attended tertiary institutions were (42.7%) and secondary school respondents were (31.7%).

On the religion of the respondents, this study shows that the majority, 79 (64.2%) were Christian while the minority, 42 (34.1%), were Muslims. This result opposes the findings from Kaoje, et al, (2018) which reiterated that almost all the respondents 34.7 (98.6%) were Muslims. From the table 42 of this research, the information on the occupation of the respondents showed that a few, 17.9% of the total population were unemployed, and minority, 26.0% were civil servants. The business women constitute an integral part of the occupation of the respondents, having the highest percentage of 48.0%. This depicts that the businesswomen were more concentrated in the total population. The respondents in the occupation of farming were 4.9% while those who are not in other occupation were just 3.3%. This is closely related to the research work (Umar et al, 2021), which concluded that housewives constituted 48.2% of their study population while civil servants constituted 34.7% of their study respondents.

Also, this study shows the descriptive statistics of the respondents' ethnicity. The Yorubas constitute the majority of the total population, having a percentage of 85.4%. This percentage is followed by the Hausas having a minority percentage of 8.9%, the Igbos are just 1.6% of the population, while other unknown respondents' ethnic groups are 4.1% of the total



population. The research work of Kaoje, et al, (2018) which revealed that majority of the respondents 19.3 (548%) were Hausa followed by Fulani 62 (17.6%) opposes the research findings of this present study. Another work by (Umar et al, 2021) showed that a greater proportion (86.0%) were Muslims and Hausas (62.3%) which is also not in tandem with this research work.

The parity, which is the number of births of the respondents, was also assessed and reported in the table. There is no confusion to this reason being that the respondents were all females, so the affinity to birth a child is at equilibrium with them all. The table shows that 35.8% of the respondents had a child. Minority, which is 31.7%, has had two children, while a few of 29.3% have birthed three children, and above. It is pertinent to include that a few of the women chose not to disclose this information, and so they form just 3.3% of the total population. This opposes the study by Afolaranmi et al (2018), which reiterated that most (84.4%) of the mothers had a maximum of four children, with 710% of their last children delivered in the health facility.

Knowledge of Mothers on Umbilical Cord Care

The finding of this study shows that the majority, 82% of the respondents, have a good knowledge about umbilical cord care, while the minority, 18% of the respondents, have a poor knowledge about umbilical cord care. It can be observed that the percentage of respondents who were aware of umbilical cord care has dropped from 94% to 82% when it comes to assessing deeper knowledge about the study topic.

Ndikom et al, (2020) in their study revealed that a slight percentage less than half of the respondents 199(48.1%), had a good level of knowledge of appropriate cord care, as opposed to the findings of this research, where a reasonably high percentage had good knowledge about umbilical cord care. The study of Osuchukwu et al (2017) also negates the findings from this study. They reported that there was poor knowledge among mothers on standard cord care, with 44.7% of respondents saying standard care was tying the stump, cutting it with a clean object, and cleaning with methylated spirit only, which was seen as good knowledge.

A study by Umar et al (2021) is in tandem with this present study. Their report of knowledge aligns with the report of this study, where they reported that most (876%) of the respondents knew about umbilical cord care. They further broke down their knowledge by reporting that the majority (90.6%) of them knew that umbilical cord care involves tying, cutting the cord, and cleaning with spirit or chlorhexidine. They also reiterated that up to 71.6% of them knew that herbs should not be used for umbilical cord care. Furthermore, 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.

Ndikom et al, (2020) also reiterated that the respondent's perception of her income was significantly associated (however inversely) with knowledge of proper cord care. Up to 60% of those who deemed themselves very poor had a good knowledge of cord care while less than half (43.9%) of those who deemed themselves financially above average had good knowledge ($p=0.04$). A higher proportion of respondents with more than four children (57.1%) had a good knowledge of proper cord care compared to those with two to four children (51.4%) and one child (41.8%), although this was not statistically significant.



Almost equal proportions of respondents who lived in rural (48.6%) and urban (47.6%) areas had good knowledge of proper cord care.

Perception of Mothers towards the Choice of Materials used for Cord Management

This research shows that the majority of the respondents reported that the choice of materials used for cord management hastens cord separation. This is one of the cogent beliefs that mothers had, and some of these beliefs have been passed down from generation to generation. Also, this research poses that a slight percentage below average of the respondents believed that the choice of instrument used for cord management can help to wade off evil spirit from the child. Lastly, this research shows that a minority of the respondents posited that the choice of instruments can cause traditional beliefs about child birth such as myths and fear of neonatal death. The perception of mothers has taken a toll on their knowledge about umbilical cord care management.

Sometimes materials used to cut and tie the cord include strings, thread, strips of cloth, scissors, and a sharp stone (Obuekwe & Obuekwe, 2008). Opara et al, (2019) reported that majority of the mothers said that it is important to care for the cord to prevent infection this is in agreement with where (56.3%) of respondents answered that it should be kept clean to prevent infection. Udosen et al, (2019) also revealed that the majority of the nursing mothers knew what cord care means when it comes to cutting, tying and cleaning the cord with methylated spirit which is in tandem to the study done in Ethiopia by Obimbo and Oruambo, (2008) where mothers knew the need for hygiene while cutting and tying the cord.

The findings of Osuchukwu et al (2018) are in line with the findings of this study. They said that the main reason for the choice of materials used for umbilical cord management was to wade off evil spirits and hasten cord separation as reported by 270 (55.9%) respondents. Other reasons given were to prevent “Ibio okop” by 185 (38.3%) of the respondents, 80 (16.6%) to prevent neonatal tetanus “odon”, 61 (12.6%) to prevent infection. In comparison, 56 (11.6%) used the various substances due to pressure from family members.

LIMITATIONS

There was a constraint of time on the part of the researcher as there was limited time to conduct the research, so the study was conducted in a few Primary Health Care centres in the State. There were challenges from the respondents, as most of them were not willing to participate in the study. It took the researcher a lot of persuasion to get those who were willing to participate. The respondents most time do not get the grasp of some of the questions asked by the researcher, so it takes a lot of time before filling out a questionnaire.

CONCLUSION

The findings show that mothers had good knowledge of umbilical cord care, while their perception of umbilical cord care was poor. Hence, there is a need to conduct an intervention study on the care of umbilical cord care among nursing mothers in Oyo State, Nigeria.



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Conflicts of Interest

There are no conflicts of interest

REFERENCES

- Afolaranmi, T.O., Hassan, Z.I., Akinyemi, O.O., Sule, S.S., Malet, M.U., Choji, C.P., & Bello, D.A. (2018). Cord Care Practices: A Perspective of Contemporary African Setting. *Frontiers in public health*. 6(10). <https://doi.org/10.3389/fpubh.2018.00010>.
- Akinyemi, J. O., Bolajoko, I., & Gbadebo, B. M. (2019). Factors Influencing Umbilical Cord Care in Nigeria. *Journal of Biosocial Science*, 1-8
- Holakouee-Naeini, S., Gholami, M., & Alimohammadi, M. (2019). Knowledge, attitudes, and practices of mothers regarding umbilical cord care in rural areas of Qazvin, Iran. *Journal of Caring Sciences*, 8(4), 676-682.
- Kaoje, A.U., Okafoagu, N.C., Raji, M.O., Adamu, Y.H., Nasir, M.A., Bello, M., & Ango, U.M., (2018). Home Delivery, Umbilical Cord Care Practices and Postnatal Care Utilization among Mothers in a Rural Community of Sokoto State. *Journal of Community Medicine and Primary Health Care*, 30(2), PP. 36-46
- Ndikom, C.M., Oluwatosin, F., & Oluwatosin O.A., (2020). Umbilical Cord Care Knowledge and Practices of Mothers Attending Selected Primary Health Care Centres in Ibadan, Nigeria. *International Journal of Caring Sciences*, 13:151-56
- Nwonwu, E.U. (2017). Knowledge, Practice and Techniques of Umbilical Cord Care. *Journal of Epidemiological Society of Nigeria*. 1(1), pp. 39-44
- Obimbo, O., & Oruambo, T. (2008). Knowledge, attitude, and practice of mothers and health workers regarding care of newborn umbilical cord in South West, Nigeria. *Journal of Tropical Pediatrics*. 8(15), pp. 45–48
- Obuekwe, T.R. & Obuekwe, E. (2008). Identifying Indigenous Health Technology Used by Women in a Rural Community in Nigeria on the Stumps of Newborns: An Increase in Cord Infection and Neonatal Tetanus. *Clinical Pediatrics* 36:648-652
- Opara, P.I., Jaja, T, Dotimi, A.D., & Alex-Hart, B.A. (2019). Newborn cord care practices amongst mothers in Yenogoa Local Government, Bayelsa State. *Nigeria International Journal of Clinical Medicine* 2011; 22-272(1), pp.1-16, Article no AJCRMH48968 12 Area,
- Osuchukwu, E.C., Okoronkwo, I.L., & Ezeruigbo, S.F., (2018). Umbilical Cord Care and Management Outcome among Mothers in Calabar South Local Government Area of Cross River State. *Nigeria International Journal of Nursing, Midwife and Health Related Cases* 4(1), pp1-11,
- Udosen, I.E. Olaoye, T., Okondu, E., Udosen, G.E., & Amaechi, D., (2019). Knowledge and Attitude of Nursing Mothers towards Umbilical Cord Care in Calabar Metropolis, Cross River State. *Asian Journal of Case Reports in Medicine and Health* 2(1): 1-16, Article no AJCRMH48968
- Umar, M.A., Adamu, A., Umar, M.T. Tajudeen, M.U. Ahmad, A.Z., & Abdulrahman, H., (2021). Knowledge and Practices of Umbilical Cord Care among Mothers Attending Antenatal Care in the Health Facilities in Sokoto Metropolis, Nigeria. *International Journal of Contemporary Medical Research*.