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Perception of Umbilical Cord Infection and its Care among Post Natal Clients in Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun State, Nigeria

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Abstract: Background: The umbilical vessels remain patent for a few days following birth which provides direct access to the bloodstream. The cord stump can therefore be an excellent medium for bacteria. Infections are the single most important cause of neonatal mortality and it is estimated that 300 000 infants die annually from tetanus and 460 000 die because of severe bacterial infections, of which umbilical cord infection is a major precursor.

Objectives: To determine the perception of umbilical cord infection and its care among post- natal clients in Olabisi Naranjo University Teaching Hospital, Sagamu, Ogun State, Nigeria

Methodology: This was a cross sectional descriptive design and 195 mothers with neonates of 3-28 days were selected using systematic sampling method. The data was collected using pre-tested semi-structured questionnaire. Descriptive analysis using means, frequency and proportions was computed and Chi-square test ($p<0.05$) was used to determine the association between dependent and independent variables.

Results: The findings of the study revealed that there was a significant relationship between age and the knowledge and level of respondents at p-value <0.05 and also the study revealed that there was a significant relationship between respondent level of education and perception of the respondent toward towards Umbilical cord infection and its care at p-value <0.05.

Conclusion: The study revealed that the respondent age was between age of 22 to 45year old with mean age and standard deviation of the respondents was 33.12 ±5.8. More of the respondents had primary school education, follow by secondary school, but minority had tertiary education. The respondent knowledge is on the high side 130 (66.7%) toward Umbilical cord infection and its care. All the respondent 195(100%) do know that appropriate cord care would prevent abdominal pain that was a result of invading organisms. The study also revealed that 154(79 %) respondents have good perception toward Umbilical cord infection and its care.

Also the coping mechanism of the respondent is high 149(76.4%) %) toward Umbilical cord infection and its care.

Recommendations: More campaigning and sensitization on the contributing factors should be tailored among mothers during ANC visits so as to avoid umbilical cord infections.

Background to the Study

Every year 2.5 million neonatal deaths occur globally in the first month after birth, and infections cause 30% (UNICEF, WHO, WB and U-DPD, 2019). A common portal of entry for bacteria colonization is a newly cut umbilical cord that provides direct access to the neonatal bloodstream (Stewart Dan WB and COFAN, 2016). Neonatal mortality has not decreased globally as much as other under-five child deaths, and sub-Saharan Africa (SSA) continues to have the highest (36%) under-five mortality rates of any region (WHO 2017).

Perception about umbilical cord infection and its prevention has been an issue of great concern amongst mothers of neonates because of the negative effects of umbilical cord infection among the neonates, mothers, and the family at large. Prevention of umbilical cord infection cannot be overemphasized because of its physiological, psychological and financial benefits on the infants, mothers and family at large.

The umbilical cord, which connects the baby and placenta in the uterus, is made of blood vessels and connective tissue. It is covered by a membrane that is normally bathed in amniotic fluid. After birth, cutting the cord physically and symbolically separates the mother and her baby. The cord stump dries and falls off, and the wound heals (Lope-Medina, LIpez-Araque, Linares-Abad & Lopez-Medina, 2020). The cord usually separates between 5 and 15 days after birth. Before the separation, the remaining stump can be considered a healing wound and thus a possible route for infection through the vessels into the baby's blood stream. (Quattrin, Rosanna & Silvio, 2015).

The World Health Organization estimates that a quarter of the world's neonatal deaths are due to infection; 75% of these occur in the first week of life with the umbilical cord being the gateway. The umbilical cord is an important bacterial colonization site. A possible consequence of bacterial colonization is cord stump infection (Dolores Lope, Medina & Belen, 2020). In the developing countries, one-third of the deaths are caused by infections, mostly because of the environment where the baby was delivered (Generally the community and the houses). Cord infection may be localized to the Umbilical Cord (omphalitis) or, after the entrance of the infection into the blood stream, it becomes systemic (e.g. neonatal sepsis). The most observed infections upon the Cord Stump and the abdominal surface are due to bacterial omphalitis with polymicrobic aetiology, but also to Clostridium tetani. The onset of the symptoms is usually observed between the fifth and the ninth day of life (Bugaje et. al. 2015).

A systematic review by Coffey et al (Coffey, Brown, 2017). Of 15 low-to-middle-income countries (LMIC), including eight countries in SSA, revealed streptococcus, Escherichia coli, and Listeria monocytogenes are the most common intracellular pathogens causing newborn sepsis. Also, Clostridium tetani is another deadly bacteria that can enter the neonate's systemic the cord stump (Khan, Vandelaer J,Yakubu, Raza, Zulu, 2015). These infections are rarely seen in industrialized countries and more commonly seen in developing countries (Painter, 2019).

There were 2.6 million under five deaths in 2016, neonatal deaths accounted for 46% which translates into the death of 7000 newborns every day (WHO, 2017). Neonates dies from situations and diseases associated with a lack of quality care at birth or improper skilled care and management immediately after birth (Castalino, Nayak & d'souza, 2014).

Evidence based report has shown that, globally, about 150,000 neonates die annually from omphalitis (Easter, 2014). Each year some 600,000 infants dies of neonatal tetanus in Africa; in untreated cases, case fatality rate approach 100% and a further 460,000 die as a consequence of other severe bacterial infections (Osuchukwu, Ezeruigbo & Eko, 2017).

Neonatal infection is a major cause of neonatal deaths as the mortality rate could be as high as 44 per thousand life-births in the north-east zone of Nigeria. Cord infection and sepsis has been on the increase due to inadequate or poor knowledge on umbilical cord care practices especially in areas where home deliveries are done. In developing countries such as Nigeria, umbilical cord infection accounts for significant number of neonatal morbidity and mortality, this accounts for 276,000 neonatal deaths annually-the second highest deaths in the world; but in Nigeria alone it accounts for about 33% of neonatal mortality (Akomolafe & Ganiyu, 2015).

The objectives of hygienic cord care practices as outlined by World Health Organization are to prevent consequences of unclean cord care which may include umbilical cord infections and neonatal deaths. Thus mothers are to adopt current standard of cord care which are based on the principles of asepsis that help in the reduction of cord infections (WHO, 2014). The sterile materials that can be used in tying the umbilical cord as recommended by WHO (2014), include sterile plastic cord clamp, narrow tapes and threads of cloth. These materials if sterile and properly applied will effectively prevent infection of the umbilical cord and death of the neonates. It is recommended that instruments used in cutting the cord should be sharp and sterile to avoid trauma and infection of the cord. Such instruments include sterile scissors or new razor blade.

World Health Organization advocates for dry umbilical cord care and application for topical antiseptics in situations where hygienic conditions are poor or infection rates are high (WHO, 2014). However, the Nigerian government recommends the use of Methylated spirit or chlorhexidine solution for cord care (FMOH, 2014; Osuorah, Ekwochi, Onah & Bernard, 2015). Variation exists in the awareness of use of methylated spirit as the most appropriate substance used for cord care across Nigeria as a country.

In a study conducted in northern part of the country by it was observed that majority of the mothers mentioned the use methylated spirit as the most appropriate cord cleansing substance compared to the high awareness of the use methylated spirit as the most appropriate cord cleansing substance that has been reported in the southern part of Nigeria (Afolaranmi, *et al.*,2018). The high indication of the use of methylated spirit by mothers might be due to its ability to keep the cord stump clean, dry and promoting quick cord separation. The others substances expressed by the mothers for cord care in other related studies were hot water, salt and saliva, herbal preparation, shea butter, tooth paste, red sand, ash among others (Osuchukwu, *et al.*,2017). This implies that traditional and socio-cultural belief systems deliver alternate sources of information with significant influence on how orthodox health information is being taken, processed and eventually utilized.

Osuchukwu, *et al.*,(2017), stated in their report on a review of umbilical infection carried out in Nigeria which showed that umbilical infections accounted for 10% and 18% of neonatal death in Port-Harcourt and Ibadan respectively while in Calabar, 49% of neonatal deaths were due to umbilical cord infection as a result of inadequate knowledge on umbilical cord care. The poor knowledge documented in the study was attributed to the sources of information and poor access to correct and factual information on umbilical cord care. IT was also reported that majority of the respondents had their information on umbilical cord management from their mothers, mothers-in-laws, church members and Traditional birth attendants (Osuchukwu, *et al.*,2017).

World Health Organization (WHO) recommends vital newborn care practices such as hygienic and umbilical cord care to decrease neonatal mortality and morbidity rate (Mohamed, 2018). The umbilical cord stump infections are the most common reason of a newborn morbidity and mortality in numerous developing countries, due to poor of hygienic care. Care practices immediately after delivery, play a major role in causing neonatal morbidities and mortalities. Insufficient knowledge of parents regarding essential newborn care leads to decrease in the quality care. Umbilical cord infections are a major cause of neonatal deaths and they occur due to poor aseptic practices, which is associated with lack of adequate knowledge of cord care practices (Bansal & James, 2016).

From the foregoing, considering the poor health indices and the increasing number of mothers returning to the health care facility with umbilical cord complications especially omphalitis in

newborns. Hence, this study assessed the knowledge of umbilical cord infection and prevention among mothers attending infant welfare clinic in two teaching hospitals in Lagos State, Nigeria.

Statement of the Problem

Majority of Neonatal deaths are believed to be due to infections. Some of these infections start as umbilical cord infection. This has led to high neonatal mortality and morbidity especially in developing countries. Inadequate knowledge about umbilical cord infection and its management has been an issue of concern because of its negative effect on the neonate, mother, family and the society at large. Umbilical cord care and practices by mothers are diverse (Asiegbu, *et al.*,2018).

There are still gaps in knowledge, attitude and practice among mothers at all levels. This was observed more in mothers who had low education, mothers who came from rural areas, irrespective of place of delivery such as home, maternity centers and Teaching Hospital (Asiegbu, *et al.*,2018).

Some researchers found that local perception and cultural beliefs and practices influenced the trend and what is used for cord care. It was observed that good knowledge, attribute and practice were found more among mothers who had higher level of education, lived in middle class areas and were older (Asiegbu, *et al.*,2018).

It has been reported that in Nigeria, there is an estimated 276,000 neonatal deaths occurs annually; 60,000 of these deaths stem from infection, while about 20,000 of these deaths are umbilical cord related. Most of these deaths occur in rural areas and northern Nigeria has the second highest number of neonatal deaths in the world after India (Okpaleke, 2017).

Omphalitis is an important cause of neonatal mortality and preventing this condition and its associated neonatal mortality is of high public health importance. While knowledge on umbilical cord management such as the use of clean birth kits, hand washing and careful attention to hygiene in the days after birth may all be important components of a program to reduce neonatal sepsis; however, reports has shown that mothers have poor knowledge on cord care infection and management (Abhulimehen-Iyoha & Ibadin, 2015).

In my years of clinical experience as a nurse, I have observed over time that most of the births occur in hospitals, where a number of precautionary and early diagnosis of neonatal problems, as well as maternal training programs are setup but this hasn't stopped the return of mothers with their babies after few weeks with cord infection complains, this could be attributed to the fact that most of these mothers lack adequate knowledge about umbilical cord care and prevention of its infection. This assessment is imperative because, it is believed that good knowledge can translate to good practices as well as better health outcome. Hence, this study assessed the knowledge of umbilical cord infection and prevention among mothers attending postnatal clinic at Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun state, Nigeria.

Objective of the Study

The general objective was to determine the perception of umbilical cord infection and its care among post-natal clients in Olabisi Naranjo University Teaching Hospital, Sagamu, Ogun State, Nigeria

Specific objectives of this study were to:

1. To determine the level of knowledge about umbilical cord infection and its care among post-natal clients in Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun State, Nigeria
2. To assess the level of perception about umbilical cord infection and its care among post-natal clients in Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun State, Nigeria
3. To determine respondents' coping strategies to umbilical cord infection and its care among post-natal clients in Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun State, Nigeria

Research Questions

1. What is the level of knowledge about umbilical cord infection and its care among post-natal clients in Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun State, Nigeria?

2. What is the level of perception about umbilical cord infection and its care among post-natal clients in Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun State, Nigeria?
3. What is the respondents' coping strategies to umbilical cord infection and its care among post-natal clients in Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun State, Nigeria?

Hypotheses

The following hypotheses would be tested at 0.05 level of significance:

Ho. There is no significant association between respondents age and their knowledge about umbilical cord infection among respondents in Olabisi Onabanjo University Teaching Hospital.

Hi. There is significant association between respondents age and their knowledge about umbilical cord infection among respondents in Olabisi Onabanjo University Teaching Hospital.

Ho. There is no significant association between respondents' level of education and their perception of umbilical cord infection.

Hi. There is no significant association between respondents' level of education and their perception of umbilical cord infection.

MATERIAL AND METHOD

Study design

The study was a descriptive cross -sectional study that assessed those factors influencing compliance with dietary regimen among Postnatal clients in Olabisi Onabanjo University Teaching Hospital, Ogun, Nigeria.

Study Population

The scope of the study would be the Postnatal clients' clinic at Olabisi Onabanjo University Teaching Hospital, Ogun, Nigeria.

Description of the study area

Olabisi Onabanjo University Teaching Hospital (OOUTH) (formerly called, Ogun State University Teaching Hospital (OSUTH) is situated at Sagamu, Ogun State, South West Nigeria. The teaching hospital was established in the year 1986 with primary aim of teaching medical students from Olabisi Onabanjo University and provision of healthcare service to the indigene of Ogun state and Nigeria as a whole.

The postnatal clinic setting

The postnatal clinic operates on Obstetrics and Gynecology, Tuesday 8.am every week. All visiting or booked are expected to drop their appointment card, make necessary payment, unless they are covered by National Health Insurance Scheme, which would automatically exempt them from any financial burden; but an official document need be produced to this effect. The dropped card would be collected by the records clerk who will sort out individual card and handover this to the Ward Assistant who will call the client's name according to first-come-first-serve. After which clients are asked to sit according to their numbers in which they would be attended to by their consultant. Postnatal clients are expected to sit down in that order where the Public Health Nurse would give health talk on maintenance of their health. Each client is dispatched after consultation to see the record clerk and have their next appointment written on their appointment cards.

Study population

Study population would be the postnatal clients who are still visiting Olabisi Onabanjo University Teaching Hospital for postnatal care and management or for continuation of care through appointment.

Sampling procedure

Simple random sampling procedure would be employed to select the study participants. Pieces of paper on which YES or NO would be written and kept in a concealed box to select the study participants. All available postnatal clients would be allowed to participate by picking once the piece of paper inside the box. Those that pick YES would be regarded as the targeted study population, while those that picked NO would be regarded as the population that was not allowed to participate in the study. Most importantly, informed consent form would be given to each participant to read, digest and adequate interpretation and answer would be given to each question asked by the participants.

Sample size calculation

The minimum sample size would be calculated using Kish-Leslie (1965) formular and prevalence of umbilical cord infection, Nigeria perspective (Vanice Petwa ,2015)

$N= Z^2pq$

D^2

n= minimum sample size required

z= standard normal deviation set at 1.96 which corresponds to 95% confidence level.

P= prevalence of umbilical cord infection = 15% = (0.150) (Vanice Petwa ,2015)

q = 1-p = (1-0.150) = 0.85

d= level of significant desired set at 0.05

: . $N = 1.96^2$ x 0.150 x 0.85

0.0025

= 3.842 x 0.150 x 0.85

0.0025

= 0.489855

0.0025

= 195.942

= 195 respondents

Instrument for data collection

The instrument for the data collection would be a semi structured interviewer administered pre-tested questionnaire consisting of 32 questions that are in 4 Sections (A-D). Section A would be used to collect data on socio-economic and demographic characteristics, Section B would be used to collect data on level of knowledge about umbilical cord infection and its care, Section C would be used to assess level of perception about umbilical cord infection and its care while Section D would be used to collect data on coping strategies to umbilical cord infection and its care.

Data collection techniques

For the purposes of this study, a pretested semi-structured self-administered questionnaire would be used to collect data from the respondents. The questionnaire contains four sections with a total of 32 questions. The content is simple and straight forward. The questionnaire would be administered by the researcher. Assistance would be given to the respondents as regards requested explanation on any question that needs clarification.

Data management and analysis.

A manual of field operation would be prepared to explain how entries would be made, how key information was met, how questionnaires would be administered and how the variables was coded.

Processing of the data included sorting, cleaning and coding of the questionnaire. Serial numbers would be written on each questionnaire for easy identification and recall of any instruments that might be missing or not properly answered. A coding scheme guide was developed after carefully reviewing the respondents' responses. Appropriate scoring would be done, and data would be coded. Data entry would done using Statistical Package for Social Science Software (SPSS INC, Chicago IL Version 25). Quantitative data would be analyzed using descriptive statistics, Chi square test and logistic regression model with level of significant set at 5%. The questionnaire would be stored in a place that is safe from destruction by either water or fire and unauthorized person would not be allowed to have access to the research instruments.

Method of Data Analysis

The data collected from the respondents were coded, entered, cleaned, and, analyzed using SPSS 22.0 statistical software. The data were analyzed using descriptive statistics such as frequency tables, mean, standard deviation and percentages. Bivariate analysis was done using a chi-square test to determine the level of association between the selected dependent and selected independent variables with p-value less than 0.05.

Ethical consideration

Ethical approval would be obtained from the Babcock University Health Research Committee (BUHREC) as part of the prerequisite before research of this nature would be carried out on Human respondents. The aim of the ethical approval is to ensure that this research conforms to the generally acceptable scientific principles and international ethical guidelines required in human subject research. Inform consent would be obtained from the respondents and confidentiality of collected information would be guaranteed.

No risk of any kind would envisage. Respondents would be provided with no incentive and no money would be expected or demanded by the researcher or his assistant over respondents' participation.

RESULT

Table 4.1a: Socio-Demographic Characteristics of Respondents surveyed (n=195)

Variable	Responses	Frequency (195)	Percentage (100)
Age	20-28	41	21.0
	29-37	105	58.8
	38- 46	49	25.1
Mean ± S.D.	33.12 ± 5.843		
Religion	Christianity	148	75.9
	Islam	47	24.1
Level of education	Primary	92	47.2
	Secondary	71	36.4
	Tertiary	32	16.4
Ethnic group	Yoruba	135	69.2
	Hausa	20	10.3
	Igbo	40	20.5
Marital Status	Married	155	79.5
	Separated	40	20.5
Number of living children	One	127	65.1
	Two	46	23.6
	Three& above	22	11.3
Occupation	Teaching	21	10.8
	Self-entrepreneur	27	13.8
	Civil servant	50	25.6
	Full housewife	97	49.7

Socio-Demographic Characteristics of Respondents surveyed (n=195)

Table 4.1 shows the socio demographic characteristics of the respondents under survey. It was revealed that 41(21.0%) of the respondents fell within age group of 20-28, (58.8%) respondents fell within age group 29-37, and 49(25.1%) of the respondents were within age group 38-46 years. The mean and standard deviation of the ages of the respondents were found to be 33.1years and 5.8years respectively. More than half of the respondents, (69.2%), were Yoruba, (10.3%) were Hausa, and the remaining (20.5%) were Igbo. Majority of the respondents (79.5%) were married, and (20.5%) are separated. Majority of the participants (75.9%) are Christians, and the remaining (24.1%) practice Islam. The table shows that 92(47.2%) of the participants highest level of education is primary level, 71(36.4%) of the participants has secondary education and the remaining 32(16.4%) has tertiary highest level of education. More than half of the respondents 127(65.1%) are blessed with one child, 46(23.6%) has two children and the remaining 22(11.3%) has three children and above. Majority of the participants 97(49.7%) are full housewife, 50(25.6%) are civil servant, followed by 27(13.8%), 21(10.8%) which are self-entrepreneur and teacher respectively.

Level of Knowledge about Umbilical cord infection and its care (n=195)

Variable	Responses	Frequency (195)	Percentage (100)
Do you know that the use of herbs, palm oil and cow dung can result in infection of umbilical cord?	Yes, I know No, I don't know I will enquire	117 56 22	60.0 28.7 11.3
Do you know that the use of unsterile scissor or blade to ligate the cord will result in infection of the cord?	Yes, I know I can't remember	146 49	74.9 25.1
Do you know that proper hand washing will reduce greatly the spread of infection to the umbilical cord?	Yes, I know	195	100.0
Do you know that appropriate cord care would prevent abdominal pain that was a result of invading organisms?	Yes, I know	195	100.0
Do you know that a properly cared umbilical cord would enhance detachment of the cord stump within 8-14days?	Yes, I know I can't remember	164 31	84.1 15.9
Do you know that besides the umbilical cord clamp used in the hospital, rubber band or thread are not advisable?	Yes, I know No, I don't know	153 42	78.5 21.5
Do you know that currently, chlorhexidine is officially recommended for the care of umbilical cord?	Yes, I know No, I don't know	148 47	75.9 24.1
Respondents knowledge scored	Low	65	33.3
	High	130	66.7

The table above revealed that all the participants knows that proper hand washing will reduce greatly the spread of infection to the umbilical cord, and appropriate cord care would prevent abdominal pain that was a result of invading organisms. The table also shows that more than half of the respondents 117(60.0%) said yes that the use of herbs, palm oil and cow dung can result in infection

of umbilical cord, 56(28.7%) said they don't know while the remaining 22(11.3%) said they will make enquiry to know if the statement is true or not.

Also majority of the respondent 146(74.9%) knows that the use of unsterile scissor or blade to ligate the cord will result to infection while the remaining 49(25.1%) said they can't remember if the use of scissor or blade to ligate the cord can cause infection. It was also revealed that majority of the participants 164(84.1%) knows that a proper cared umbilical cord would enhance detachment of the cord stump within 8-14days, while the remaining 31(15.9%) said they can't remember if it will enhance the stump detachment within 8-14days.

Majority of the participants 153(78.5%) knows that beside the umbilical cord clamp used in the hospital, the use of rubber band or thread are not advisable while the remaining 42(21.5%) said that don't know that the use of thread and rubber band is not advisable. Also, majority of the participants 148(75.9%) knows that chlorhexidine is officially recommended for the care of umbilical cord while the remaining 47(24.1%) don't know about the use of chlorhexidine for the care of umbilical cord.

The percentage of respondents who had high knowledge 130 (66.7%) about umbilical cord infection and its care was more than those with low knowledge 65 (33.3%) as seen in the table above.

Respondents' level of perception about umbilical cord infection and its care (n=195)

Variable	Responses	Frequency (195)	Percentage (100)
Do you perceive that infection of the umbilical cord can increase mortality and morbidity of the neonate?	Yes, I perceive No, I don't perceive	169 26	86.7 13.3
Do you perceive that the use of herbs, though, is culturally practiced but its usage can endanger the health of the neonate?	Yes, I perceive No, I don't perceive	160 35	82.1 17.9
Do you perceive that positive health care worker's attitude would encourage appropriate maternal umbilical cord care and prevent its infection?	Yes, I perceive	195	100.0
Do you perceive that following strictly the health care worker instruction would assist women in giving appropriate umbilical cord care and prevent neonatal infection?	Yes, I perceive	195	100.0
Do you perceive that the ability to adhere to strict uptake of immunization scheme would prevent neonatal mortality and morbidity?	Yes, I know I can't remember	167 28	85.6 14.4
Do you perceive that the ability to strictly adhere to routine postnatal visit would enable me and my child to listen to require health counseling and advice that promotes good umbilical cord care?	Yes, I perceive No, I don't perceive	151 44	77.4 22.6
Do you perceive that good knowledge of cord care prevents	Yes, I perceive No, I don't	158 8	81.0 4.1

lots of infection that result into high neonatal mortality and morbidity?	perceive I can't remember	29	14.9
Do you perceive that neonatal mortality and morbidity are not rampant among mothers who deliver in standard hospital compare with those that deliver with traditional birth attendance?	Yes, I perceive No, I don't perceive	158 37	81.0 19.0
Do you perceive that uptake of routine immunization would drastically prevent neonate from contracting any cord infection like tetanus?	Yes, I perceive No I don't perceive	153 42	78.5 21.5
Do you perceive that the use of native chalk, salt, sand, saliva and palm oil in the treatment of umbilical cord would result into increased neonatal mortality and morbidity?	Yes, I perceive No I don't perceive	163 32	83.6 16.4
Respondents' perception score about umbilical cord infection and its care.	Negative Positive	41 154	21.0 79.0

From the table above, all the participants perceived that positive health care worker's attitude would encourage appropriate maternal umbilical cord care and prevent its infection, also they all agreed that strictly following the health care worker instructions would assist women in giving appropriate umbilical cord care and prevent neonatal infection. Majority of the participants 169(86.7%) said they perceived that infection of the umbilical cord can increase mortality and morbidity of the neonate, while the remaining 26(13.3%) said they don't perceived it. Also, 160(82.1%) of the participants perceived that the use of herbs can endanger the health of the neonate while the remaining 35(17.9%) don't perceived it, as they see nothing bad in using herbs for a neonate.

Majority of the participants 167(85.6%) knows that the ability to strictly adhere to the uptake of immunization scheme would prevent neonatal mortality and morbidity while the remaining 28(14.4%) don't remember to adhere to the neonatal immunization scheme. Also, 151(77.4%) of the participants perceived that the ability to strictly adhere to routine postnatal visit enable them and their child to listened to required health counseling and advice that promotes good umbilical cord care, while the remaining 44(22.6%) don't perceived it. Majority of the participants 158(81.0%) perceived that neonatal mortality and morbidity are not rampant among mothers who deliver in standard hospital compare with those that deliver with traditional birth attendance, while the remaining 37(19.0%) don't perceived it.

The table above also revealed that, among all the total respondent 153(78.5%) of the respondents, perceived that uptake of routine immunization would drastically prevent neonate from contracting any cord infection like tetanus, and 42(21.5%) don't perceived it. Also, 163(83.6%) of the total participants perceived that the use of native chalk, salt, sand, saliva and palm oil in the treatment of umbilical cord would result into increased neonatal mortality and morbidity while the remaining 32(16.4%) don't perceived it.

The percentage of respondents who had positive perception 154 (79%) about umbilical cord infection and its care was more than those with negative perception 41 (21.0%) as seen in the table above.

Respondents' coping strategies to umbilical cord infection and its care (N=195)

Variable	Responses	Frequency (195)	Percentage (100)
Do you think that it is easy to cope with the current use of methylated spirit and Chlorhexidine?	Yes, I think No, I don't	169 26	86.7 13.3
Do you think that respondents' high level of education helps a lot in the care of umbilical cord and prevention of umbilical cord infection?	Yes, I think No, I don't	167 28	85.6 14.4
Do you think that respondents' who are urban duelers have good knowledge of umbilical cord care compared to those who are rural duelers?	Yes, I think No, I don't	162 33	83.1 16.9
Do you think that respondents' ability to deduce that a smelly umbilical cord is a good sign of infection has helped greatly?	Yes, I think No, I don't	158 37	81.0 19.0
Do you think that respondents' ability to know that use of harmful materials that are already contaminated with bacterial and spores would increase the risk of infection?	Yes, I think	195	100.0
Do you think that respondents' ability to disallow the advice given by significant others on local care of umbilical cord promote my child's good health?	Yes, I think No, I don't	151 44	77.4 22.6
Do you think that respondents' strict adherence to all prescribed medications during post-natal visit enables me to cope with the stress related to umbilical cord care?	Yes, I think No, I don't	150 45	76.9 23.1
Do you think that respondents' ability to be self-disciplined has really helped in coping with the stress of umbilical cord care and prevention of infection?	Yes, I don't	195	100.0
Respondents' coping strategies to umbilical cord infection and its care.	Low High	46 149	23.6 76.4

The table above table shows that out of 195 participants, 169(86.7%) of the participants think that it is easy to cope with the current use of methylated spirit and chlorhexidine, 26(13.3%) said no they don't think it is easy to cope with it. Among the respondents 167(85.6%) think that respondents high level of education helps a lot in the care of umbilical cord and prevention of umbilical cord infection by saying yes, 28(14.4%) says no.

All the participants thinks that respondents' ability to use harmful materials that are already contaminated with bacterial and spores would increase the risk of infection. 162(83.1%) of the total participants, think that respondents' who are urban duelers have good knowledge of umbilical cord

care compared to those who are rural duelers, and the remaining 33(16.9%) says no. Majority of the participants, 158(81.0%) think that respondents' ability to deduce that a smelly umbilical cord is a good sign of infection has helped greatly by saying yes, and 37(19.0%) says no.

More than half of the total participants' 151(77.4%) thinks that respondents' ability to disallow the advice given by significant others on local care of umbilical cord promote their child's good health while the remaining 44(22.6%) don't think so, by saying no. 150(76.9%) of the respondents, also think that strictly adherence to all prescribed medications during post-natal visit enables them to cope with the stress related to umbilical cord, and the remaining 45(23.1%) don't think so, by saying no. Also, all the attending participants thinks that respondents' ability to be self-disciplined has really helped them to cope with the stress of umbilical cord care and prevention of infections.

The percentage of respondents who had high coping strategies 149 (76.4%) about umbilical cord infection and its care was more than those with low strategies 46 (23.6%) as seen in the table above.

Bivariate Analysis

Hypothesis Testing

The following hypotheses were tested at 0.05 level of significance:

Ho1: There is no significant association between respondents age and their knowledge about umbilical cord infection among respondents

Ho2: There is no significant association between respondents' level of education and their perception of umbilical cord infection.

Age against knowledge score

Age	Knowledge categories					
	Low knowledge (%)	High knowledge (%)	Total (%)	df	Chi-square	P-value
20-28	13 (31.7)	28 (68.3)	41(100.0)	2	7.730	0.021
29-37	43 (41.0)	62 (59.0)	105 (100)			
38-46	9 (18.4)	40 (81.6)	49(100.0)			
Total	65 (33.3)	130 (66.7)	195(100)			

The table above shows that, out of total participants of 195, minority of the participant were between the age group of 20-28 have fair knowledge about umbilical cord infection and it care, less than half of the participants are also within the same age group but have a very good knowledge about umbilical cord infection and its care. Minority of the participants that are within the age group of 29-37 have fair knowledge about umbilical cord infection and it care, and more than half of the participant have good knowledge about it. The table revealed that more than half of the participants have good knowledge of umbilical cord infection and its care while the remaining have fair knowledge about it. This show statistically that there is significant association between age and the respondents' level of knowledge of umbilical cord infection and its care with P-value of 0.021 which indicate that their age influenced their level of knowledge about umbilical cord infection and its care.

Level of education against perception of umbilical cord infection.

Highest level of education.	Perceived categories.					
	Positive perception (%)	Negative perception (%)	Total	Df	Chi-square	P-value
Primary	78 (84.8%)	14 (15.2%)	92	2	12.136	0.002
Secondary	58 (81.7%)	13 (18.3%)	71			
Tertiary	18 (56.2%)	14 (43.8%)	32			
Total	154 (79.0%)	41 (21.0%)	195			

The table above show that, majority of the total respondent wih primary level of education and have good perception of umbilical cord infection while the remaining 14 (15.2%) of the respondent with primary level of education have fair perception of umbilical cord infection. Followed by, 71 (36.4%)

of the total participants have secondary level of education and only 58 (81.7%) among them have good perception of umbilical cord infection while the remaining 13 (18.3%) have fair perception about it. The remaining 32 (16.4%) of the total participants have tertiary level of education, 18 (56.2%) have good perception of umbilical cord infection and the remaining 14 (43.8%) have fair perceptions about it. This shows statistically that there is significant association between respondents' level of education and their perception of umbilical cord infection with P-value of 0.002 which indicate that their level of education influenced their perception of umbilical cord infection and its care.

Discussion of Findings, Conclusion and Recommendation

Discussion of Findings

Majority of the respondents are married which implies that more married women participated in the study with more from Yoruba ethnic group. Majority of the respondents are having at least one child and more than half of the respondents are full housewife.

Respondents' level of knowledge about umbilical cord infection and its care.

Majority of the respondents know that the use of herbs, palm oil and cow dung can result in infection of the umbilical cord and this is in line with the finding of (John, Nsemo, Opiah, Robinson-BAssey & Yagba, 2015) that concluded that Although, methylated spirit is usually used TBAs, local herbs were also used making the risk of harmful cord care practices common in our communities (John, Nsemo, Opiah, Robinson-BAssey & Yagba, 2015). Majority of the respondents knows that the use of unsterile scissors or blade to ligate the cord will result in infection of the cord. This is in line with the findings of the (WHO 2014) who concluded that unhygienic cutting of the cord and the application of unclean substances to the cord increase the risk of cord infection.. All the respondents knows that proper handwashing will reduces greatly the spread of infection to he umbilical cord. This is not in line with the study conducted by (Afolarmi, et.al 2018), in the northern part of Nigeria, where it was reported that fewer than half of the mothers practiced hand washing prior to handling the cord, which is far lower than the majority who practiced hand washing before cord cleaning in studies conducted in Benin city Nigeria and Uganda (Kayom, Kakuru & Kiguli, 2015; Afolarnmi, et. al, 2018) Also from this study all the respondent knows that the appropriate cord care would prevent abdominal pain that was as a result of invading organisms. These findings correlate with the finding of (Amare, 2014; Coffey & Brown, 2017; WHO, 2017). Who found that the cord care practices immediately after delivery play a major role in reducing neonatal morbidities and mortalities. In this study, majority of the respondents know that currently chlorhexidine is officially recommended for the care of umbilical cord. This finding is correlates with the findings of (Abhulimhen Iyoha & Ibadin, 2015) who concluded that consequently, WHO advocated and deployed widespread use of topical 7.1% chlorhexidine for the care of umbilical cord stump in settings of poor environmental hygiene or where neonatal mortality is high. This study also revealed that majority of the respondents had good knowledge about umbilical cord infection and its care. This is in line with a study carried out in Ebonyi State by (Asiegbu, Asiegbu & Ezeonu, 2018) on mothers aged 26 years and above (60.34%) had good knowledge of cord care.

Respondents' level of perception about umbilical cord infection and its care.

This study revealed that majority of the respondents perceived that infection of the umbilical cord can increase mortality and morbidity of the neonate. This finding correlates with the findings of (Monebenimp, Enganemben, Chelo, Foumane, Kamta, & Kuaban, 2015). Who found that in the studies conducted in Cameroon and Nigeria both in the West African sub-region reported unsatisfactory levels of cord care practices among mothers bring to bear its importance to increased risk of infections and mortality in the neonatal period. Majority of the respondents perceive that the use of herbs, though, is culturally practiced but it's usage can endanger the health of the neonate.This is in line with the study conducted by (John, Nsemo, Opiah, Robinson-BAssey & Yagba, 2015). Whose finding reveled that although, methylated spirit is usually used by TBAs, local herbs were also used making the risk of harmful cord care practices common in our communities. This finding revealed that majority the respondents perceived that positive health care worker's attitude, the

ability to adhere to strict uptake of immunization scheme and also following strictly the health care worker instruction would assist women in giving appropriate umbilical cord care and prevent neonatal infection. Also perceive that good knowledge of cord care prevents lots of infection that result into high neonatal mortality and morbidity. These findings negate the findings by (Akomolafe & Ganiyu, 2015) who stated that cord infection and sepsis has been on the increase due to inadequate or poor knowledge on umbilical cord care practices especially in areas where home deliveries are done in developing countries. It was shown in this study that majority of the respondents had a good perception about umbilical cord infection and its care.

Respondents' coping strategies to umbilical cord infection and its care.

Majority of the participants think that it is easy to cope with the current use of methylated spirit and chlorhexidine. Also, high number of participants think that respondent's high level of education helps a lot in the care of umbilical cord and prevention of umbilical cord infection. All the participants thinks that respondents' ability to use harmful materials that are already contaminated with bacterial and spores would increase the risk of infection. More than half of the respondents think that people who are urban duelers have good knowledge of umbilical cord care compared to those who are rural duelers. This is in line with the study conducted in Ebonyi by (Asiegbu, Asiegbu & Ezeonu, 2018) who stated that urban dwellers had good knowledge of cord care compared to the rural dwellers. Majority of the participants also think that respondents' ability to deduce that a smelly umbilical cord is a good sign of infection has helped greatly. This is in line with the study conducted in Ebonyi by (Asiegbu, Asiegbu & Ezeonu, 2018) who stated that many know that a smelly umbilical cord is a sign of infection, even though WHO recommends that the umbilical cord should be kept clean and dry. More than half of the total participants' thinks that respondents' ability to disallow the advice given by significant others on local care of umbilical cord promote their child's good health. While majority of the respondents also think that strictly adherence to all prescribed medications during post-natal visit enables them to cope with the stress related to umbilical cord. Also, all the attending participants thinks that respondents' ability to be self-disciplined has really helped them to cope with the stress of umbilical cord care and prevention of infections. This study also revealed that majority of the respondents had high coping strategies about umbilical cord infection and its care was more than those with low strategies.

Age on Knowledge

This study revealed that more than half of the participants have good knowledge of umbilical cord infection and its care while the remaining few participants have fair knowledge about it. This also show statistically that there is significant association between age and the respondents' level of knowledge of umbilical cord infection and its care which indicate that their age influenced their level of knowledge about umbilical cord infection and its care. This is in line with a study carried out in Ebonyi State by (Asiegbu, Asiegbu & Ezeonu, 2018) on mothers aged 26 years and above (60.34%) had good knowledge of cord care.

Education on Perception

This study shows statistically that there is significant association between respondents' level of education and their perception of umbilical cord infection which also indicate that their level of education influenced their perception of umbilical cord infection and its care. This is not in line with the study carried out by(Abhulimehen-Iyoha & Ibadin, 2015; Asiegbu, Asiegbu, & Ezeomu, 2018). who stated that some studies also observed that good knowledge, attitude and practice were found more among mothers who had higher level of education, lived in middle class areas and were older.

Conclusions

Umbilical cord infection is still a problem among neonates aged between 3 to 28 days which is one challenge of the development. Birth control is one method among others prodigious mechanisms to prevent umbilical cord infection, however it is still a problem since there is still the cases of umbilical cord infection especially in the country. Although majority of the respondents in this study demonstrated adequate knowledge, the practice of umbilical cord care among the respondents was

suboptimal. But there are still gap in knowledge, perception and practices among mothers at all level. This was observed more in mothers who came from rural areas, irrespective of the place of delivery.

Recommendation

From the findings of this study, it is recommended that periodic and quality 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. Also, mother's/care takers are recommended to be updated towards the programs they deliver to community including family planning and post-natal care and then to inform community at lastly.

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