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Prevention of Neonatal Sepsis among Mothers in Primary Healthcare Centres in Zaria, Kaduna StateAuwalu Muhammed^{1*} and Rita Anangio Ushi²Department of Nursing Sciences, Faculty of Allied Health, College of Health Sciences, Usmanu Danfodiyo University Sokoto, Nigeria¹, Department of Nursing Services, Ahmadu bello University Teaching Hospital, Shika, Zaria, Kaduna².All correspondence*: +234-803-530-4009/ abukhalid.auwal@gmail.com/
<https://dx.doi.org/10.4314/sokjmls.v8i4.1>**Abstract**

Neonatal sepsis is a major threat to the life of neonates and increase neonatal mortality; however, mothers have roles in its prevention through hand hygiene and umbilical cord care. This study was carried out to assess the knowledge, attitude, and practice of mothers towards prevention of neonatal sepsis in Primary Healthcare Centres (PHCs) in Zaria. Descriptive survey design was adopted while data was collected from 260 mothers attending PHCs in Zaria through multistage sampling. The data obtained was analysed using SPSS version 23 and the result presented in frequency and distribution tables. The findings revealed that, the mothers of neonates attending PHCs in Zaria have knowledge on prevention of neonatal sepsis as 70.2% knew its meaning and its causes (61.5%), while 60.7% knows what umbilical care is. Additionally, 64.3% knew that methylated spirit and chlorhexidine are good to clean umbilical cord. Mothers showed a positive attitude (M: 2.8; SD: 0.8) towards prevention of neonatal sepsis and sometimes most of them practice the prevention of neonatal sepsis through cleaning of umbilical cord (65.4%), twice a day (68.3%), and sometime wash their hands (48.0%) before and after handling a baby. Nurse-midwives should lay more emphasis during antenatal clinic visit on the importance of hand washing and keeping the umbilical cord clean to prevent neonatal sepsis.

Keyword: Knowledge; Attitude; Practice; Prevention; Neonatal Sepsis

Introduction

Globally, sepsis is one of the major causes of morbidity and mortality particularly in neonates probably due to their fragile nature (WHO, 2019). Despite recent advances in healthcare, the estimated global burden for neonatal sepsis was 2,202 per 100,000 live births, with mortality rate of between 11% and 19% while more than 40% of under-five deaths occur in the neonatal period, resulting in 3.1 million new-born deaths each year (WHO, 2019). Neonatal sepsis, also called sepsis neonatorum has been described as an invasive infection, usually of bacterial origin, occurring during the neonatal period and is characterized by reduced sucking, apnoea, bradycardia, temperature instability, respiratory distress, vomiting, diarrhoea, abdominal distention, jitteriness, seizures, and jaundice (Tesini, 2020). Statistically, neonatal sepsis accounts for an estimated 26% of under-five deaths, with sub-Saharan Africa (SSA) having the highest mortality rates. Sub-Saharan Africa has an uneven burden of neonatal mortality leading to an estimated 49.6% of all under-five deaths in 2013 (Liu *et al.*, 2018). In developing countries, umbilical cord infections constitute a major cause of neonatal morbidity and pose significant risk for mortality (WHO, 2020). The umbilical cord is usually wet with an open surface wound and blood vessels still patent. This provides a nutritive culture medium for bacterial growth and development (Osuchukwu, 2019). Some degree of hygiene practices must be adopted particularly by mothers or caregivers to prevent infection, which may present as yellow discharge from the cord, foul smelling, red skin

around the base of the cord, pain (with touch of the skin around the stump) and excessive crying, these strengthen the need for standard cord care practice among mothers (Bemor and Uta, 2019). The care of the umbilical cord varies between communities and depends on the level of education of the mothers, cultural and religious beliefs, and availability of resources. A review of umbilical infection at the University College Hospital Ibadan, showed that it was associated with 18% of neonatal deaths (Edmod and Zaid, 2019). The incidence of neonatal sepsis from umbilical cord infection keeps increasing because of the increased rate of home deliveries (Soofi *et al.*, 2020). Ango *et al.*, 2021 reported that there is suboptimal practice of umbilical cord care among mothers in Sokoto. However, little is known on the knowledge and attitude of mothers toward prevention of neonatal sepsis among mothers in Northern Nigeria. It was also not clear about the substances mothers used in the umbilical care for the newborn.

Knowledge, attitude and practice of nursing mothers towards cord care have a great impact on the health of the child (Liu *et al.*, 2018). Poor cord care can lead to infection of the umbilical cord. Cord care practices are normally given to mothers during antenatal and postnatal periods especially in Primary Healthcare Centres; the care the newborn receives is dependent on the knowledge, skills and attitude of these mothers (Yadav, 2013). It was observed that despite the advancing healthcare system in Nigeria, the admission of neonates to the neonatal intensive care unit (NICU) with infection, most typically sepsis, has increased especially referrals from rural settings where the only health facility available is Primary Healthcare Centres (PHC). Although these PHC centres particularly in Zaria Local Government Area and its environs are not sophisticatedly built and equipped like the general and teaching hospitals, yet many pregnant women go there for antenatal and postnatal care services. The aim of this study is to find out the knowledge, attitude, and practice of mothers towards prevention of Neonatal Sepsis in Primary Healthcare Centres (PHC) in Zaria, Kaduna.

Methodology

A descriptive survey design was used to obtain

relevant information on 'knowledge, attitude and practice of mothers towards prevention of neonatal sepsis in Primary Healthcare Centre in Zaria LGA. The aim of a descriptive research is to accurately and systematically describe a population, situation or phenomenon. It can answer what, where, when and how questions. In this method, the researcher only observed and measured the variable without manipulation (McCombes, 2020).

Population and Sampling

The study was conducted in Primary Healthcare Centres in Zaria Local Government Area (LGA). The administrative headquarter is Zaria city, and it has 13 political wards. There is at least one primary health care centre in each of the ward. The target population of this study were mothers with neonates attending post-natal clinic in Primary Healthcare Centres in Zaria LGA. The average weekly attendance of the mothers at the post-natal clinic was estimated to be 115 mothers. The average monthly attendance was estimated to be $115 \times 4 = 460$ while the yearly attendance was estimated to be $460 \times 12 = 5520$. Therefore, the target population for this study was 5520. The inclusion criteria included; attendance to the post-natal clinic in Primary Healthcare Centres in Zaria LGA with babies within the neonatal period (0–28 days). Mothers whose babies were more than 28 days old and attend post-natal clinic in Primary Healthcare Centres in Zaria LGA were excluded from the study. The sample size used for this study was 260. This was determined using Yamane (1967) formula. To get the required number of participants, a multi-stage sampling technique was used. First, Zaria LGA was stratified into 13 political wards. Secondly, five (5) political wards were randomly selected. Then the PHCs in the selected wards were used. The sample size was divided by the number of the selected PHCs. Proportional allocation was used to get the required number of mothers in each of the selected PHCs.

Instrument for data collection

A self-administered questionnaire was used as instrument for the study. The instrument consists of four (4) sections. Section A: focused on respondent's socio-demographic data. Section B:

focused on knowledge of mothers regarding prevention of neonatal sepsis. Section C: focused on the attitude of the mothers regarding prevention of neonatal sepsis. While section D: focused on extent of practice of prevention of neonatal sepsis among the mothers.”

The questionnaire was presented to the maternal and newborn experts for vetting and correction to ensure face and content validity and understandability of the instrument. In the process, some items in the questionnaire were reframed and others dropped completely based on the advice of the experts. In addition, the instrument was pretested in the Post-natal Clinic of St. Luke's Anglican Hospital, Wusasa, Zaria. Ten percent (10%) of the sample size (27) questionnaires were administered to the mothers and the results showed a reliability index ranging 0.7 to 0.9 in the three scales of knowledge attitude and practice with an overall Cronbach's alpha of 0.84.

Data collection

The letter of authority issued by the Zaria LGA Department of Health was used to seek permission from each of the selected PHC Coordinator to access the mothers in the selected PHC. The researcher worked along with five Healthcare Workers (one for each of the selected PHC) to administer the questionnaires to the mothers. The research assistants were properly briefed on how to help the respondents in filling the questionnaire. The researcher instructed the healthcare workers to inform the mothers on the research and seek their willingness to participate in the study. Verbal permission was sought from each mother before administering the questionnaire.

Data analysis

The data collected was analyzed using descriptive statistics. The data was analyzed using the Statistical Package for Social Sciences (IBM SPSS) version 23. Four-point Likert rating scale was employed to analyze the attitude of the

mothers regarding prevention of neonatal sepsis as: SA – Strongly Agree = 4; A – Agree = 3; D – Disagree = 2; SD – Strongly disagree = 1. This means that, any calculated mean that was equal to or more than 2.5 was said to be positively skewed, i.e., opinion accepted. Any calculated mean that was less than 2.5 was said to be negatively skewed, i.e., the opinion was rejected. The extent of practice was determined using modified 3 points scale as: A – Always (3 point); S – Sometimes (2); N – Never (1) = 3 + 2 + 1 = 6. The decision mean was 2

Ethical Consideration

Permission to conduct the research was obtained from Zaria LGA Secretariat. In addition, permission to conduct the study was obtained from each PHC Coordinator. Consent of the mothers was obtained before administering the questionnaire to them. Anonymity of the respondents was ensured by not asking for their names, phone number or contact address. In addition, participation in the study was voluntary while all information given was treated confidential.

Results

Results in Table 1 suggested that most of the respondents (47.2%) were within the age range of 21. to 26 years which shows that, majority of the women are within their active reproductive age. Information on the tribe of the respondents revealed that nearly half of the women (48.8%) are Hausa by tribe who had between 4 and 6 children, (52.8%). The age of the children shows that the majority of the babies (54.8%) were within 0 to 7 days. Additionally, the majority of the respondents (85.7%) were of the Islamic religion while 14.3% were Christians. Most of the respondents (41.3%) had secondary educational and only 11.3% had tertiary level of education. Almost half of the women (46.8%) were unemployed/applicant with only 9.1% who were gainfully employed.

Table 1: Socio-demographic Characteristics of the Respondents

Variable	Frequency (F)	Percentage (%)
Age (in years)		
15 – 20	35	13.9
21 – 26	119	47.2
27 – 32	73	29.0
33 – 38	13	5.1
39 – above	12	4.8
Tribe		
Igbo	27	10.7
Yoruba	40	15.9
Hausa	123	48.8
Others	62	24.6
Parity		
1 - 3 children	53	21.0
4 - 6 children	133	52.8
7 – 9 children	66	26.2
Age of Child (in days)		
0 – 7	138	54.8
8 – 15	91	36.0
16 – 21	13	5.2
22 – 28	10	4.0
Religion		
Christianity	36	14.3
Islam	216	85.7
Educational Attainment		
Informal education	56	22.2
Primary	59	23.4
Secondary	104	41.3
Tertiary	30	11.3
Postgraduate	3	1.2
Occupation		
Gainfully employed	23	9.1
Student	35	13.9
Full time house wife	76	30.2
Unemployed/Applicant	118	46.8

Table 2 shows that the majority of the women (70.2%) view neonatal sepsis as infection in newborn and they were aware (61.5%) that microorganism (bacteria) causes neonatal sepsis. Concerning the umbilical care as a preventive measure, most of the respondents (72.2%) had heard about umbilical cord care (M: 1.55; SD: 0.87); but a few (17.1%) were not sure about it. Among the 72.2% that have heard of umbilical cord care, the majority (60.7%) felt umbilical cord care (UCC) means “Tying, cutting and cleaning with methylated spirit and a cotton bud” (M: 2.5; SD: 0.81). Most of the respondents (64.3%) agreed that methylated spirit and chlorhexidine is used in umbilical cleaning. This shows that majority of the respondents have some knowledge of infection preventive through umbilical cord care.

Table 2: Knowledge of Prevention of Neonatal Sepsis

Variable	Frequency (F)	Percent (%)	\bar{x}	Std.
Meaning of neonatal sepsis				
Fever in new born	41	16.3		
Infection in newborn	177	70.2		
Newborn injury	21	8.3		
I am not sure	13	5.2		
Causes of neonatal sepsis				
Microorganism	155	61.5		
Spiritual attack	36	14.3		
It is normal	61	24.2		
Have you heard of umbilical care?			1.5	0.77
Yes	182	72.2		
No	27	10.7		
I am not sure	43	17.1		
Meaning of Umbilical cord care			2.5	0.81
Not applying anything to cord till it falls	36	26.2		
Use of herbal preparation to clean cord	21	13.1		
Tying, cutting and cleaning cord with methylated spirit and a cotton bud	125	60.7		
Do you think umbilical cord care is a way of preventing neonatal sepsis?			1.3	0.67
Yes	202	80.2		
No	21	8.3		
I am not sure	29	11.5		
What substance should be used in cleansing the umbilical cord?			2.1	0.98
Methylated spirit	57	22.6		
Methylated spirit and chlorhexidine	162	64.3		
Apply nothing	7	2.8		
Herbs	11	4.4		
Hot water	15	6.0		
Umbilical cord should be exposed after cleaning by folding diaper under it			1.1	0.2
Yes	240	95.2		
No	12	4.8		
Reason for caring for umbilical cord			1.2	0.66
To prevent infection	221	87.7		
To prevent abdominal pain	31	12.3		

Compared to the decision rule of 2.5, the result shows that majority of the respondents agreed that baby's umbilical cord requires special care to prevent infection (M: 3.7; SD: 0.47). The majority of the respondents also agreed that it is necessary to clean baby's cord regularly (M: 3.5; SD: 0.78); they also agreed with the statement that there is need to wash hands before cleaning the baby's cord (3.4; SD: 0.85). The average calculated mean of 2.8 is higher than the decision mean of 2.5. This suggested that most of the mothers have positive attitude toward prevention of neonatal sepsis.

Table 3: Attitude towards Prevention of Neonatal Sepsis

Statement	Mean	SD	Remark
Baby's umbilical cord requires special care to prevent infection	3.7	0.47	Accepted
It is necessary to clean baby's cord regularly to prevention infection	3.5	0.78	Accepted
There is need to wash hand before cleaning the baby's cord	3.4	0.85	Accepted
Cleaning baby's cord is not necessary	1.5	0.61	Rejected
I clean the cord only when it is has an offensive odour.	1.5	0.59	Rejected
I clean the umbilical cord only when I change my baby's diaper.	2.0	0.99	Rejected
Average Mean	2.8	0.80	

Regarding prevention of sepsis, the majority of respondents clean their babies' cord (65.4%) sometimes and the cord was cleaned twice a day by most respondents (68.3%). Sometimes most of the respondents (48%) wash their hands before and after cleaning the cord (see Table 4).

Table 4: Practice of Prevention of Neonatal Sepsis

Variable	Always (%)	Sometimes (%)	Never (%)
I use to clean my baby's cord	84(33.3)	168(65.4)	0(0.0)
I clean the umbilical cord twice a day	61(24.2)	172(68.3)	19(7.5)
I clean the umbilical cord once a day	78(31.0)	97(38.5)	77(30.5)
I clean the umbilical cord three times a day	27(10.7)	86(34.1)	139(55.2)
I wash my hands before and after I clean cord	97(38.5)	121(48.0)	34(13.5)
I Clean the cord of my baby after each diaper was changed	31(12.3)	63(25.0)	158(62.7)

Always = 3; Sometimes = 2; Never = 1;

Discussion

Most of the respondents were between the age of 21 to 26 years, Hausa by tribe, had 4 to 6 babies most of whom were aged 0 to 7 days during the study. The women were Muslims having secondary education and were unemployed. The majority of the mothers were within the age bracket of 21 – 26 years. This shows that majority of them are in their active reproductive age. Findings also showed that the majority of the mothers are Hausa by tribe; this is related to the fact that Hausa speaking ethnic group dominate Zaria LGA. The parity of the mothers revealed that majority of them had between 4 – 6 numbers of children and neonates who were between 0 – 7 days. The distributions based on religion revealed that, majority of the women are Muslims; this is also related to the fact that Zaria LGA is located in an Islam dominated area of Kaduna State. Most of the women attained secondary level of education. Almost half of the women were unemployed/applicant while 30.2% were full housewives.

The present study findings indicated that most of the respondents have some knowledge of infection prevention through umbilical cord care. The study also revealed that, most of the mothers have knowledge on prevention of neonatal sepsis as they correctly defined umbilical care; most of them opined that umbilical cord care is a way of preventing neonatal sepsis while most of them agreed that methylated spirit and chlorhexidine are the substances used to cleanse umbilical cord to prevent neonatal sepsis. The present finding corroborates with that of Udosen, and Ndie (2019) and Ndikom *et al.* (2020) in Ibadan who revealed that majority of the respondents had a good level of knowledge of appropriate umbilical cord care, which helps in prevention of neonatal sepsis. The finding of this study however contradicted with that of Mohammed *et al.* (2020) who in their study in Jos metropolis revealed that a significant number of the respondents had poor knowledge of cord care.

Overall, the attitude of the women towards prevention of neonatal sepsis is positive. The finding of the study revealed that, the attitude of the mothers of neonates attending PHCs Zaria

LGA towards prevention of neonatal sepsis is positive. The finding also corroborates the study of Udosen and Ndie (2019) in Calabar which revealed that, mother's attitude towards care of the umbilical cord was positive; it was therefore concluded that the mothers had fair positive attitude towards umbilical cord care and prevention of neonatal sepsis. The participants clean umbilical cord twice a day sometimes. In addition, they sometime wash their hands before and after cord cleansing.

Sometimes mothers clean their baby's cord twice a day. The findings also showed that the majority of the mothers wash their hands sometimes before and after cleaning the cord. Our finding is at variance with the result of the study of Mall *et al.* (2021) who demonstrated poor practice of mothers, and that only 12.9% had good practice. However, Mohammed *et al.* (2020) on assessment of knowledge and cord care practices among pregnant women in selected PHCs in Jos found that the practice of prevention of neonatal sepsis was fair among the mothers. Similarly, Ango *et al.* (2021) reported a good practice of umbilical cord among the respondents in Sokoto. As in the present study (the practice was only sometimes), the findings in Ango *et al.* (2021) indicated that the practice of umbilical cord care was suboptimal. Although most of the mothers acknowledge to practice preventive measures for neonatal sepsis sometimes, nurses should intensify effort on educating pregnant mothers and neonatal mothers to always apply these measures for the prevention of neonatal sepsis.

This study is limited to the few measures in the prevention of neonatal sepsis. These were belief to be easily practice by the mothers. Future research can broaden the scope to include other preventive measures.

Conclusion

This study on the knowledge, attitude and practice of mothers towards prevention of neonatal sepsis in Primary Healthcare Centres in Zaria concludes that; mothers of neonates have knowledge on the prevention of neonatal sepsis, their attitude towards prevention of neonatal sepsis is positive and they sometimes use safe practices for the prevention of neonatal sepsis.

Nurse-midwives should lay more emphasis on the importance of “Always washing hand and cleaning the cord” for the prevention of neonatal sepsis to pregnant women during antenatal clinic.

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