Original Research Article

HAND WASHING AND OTHER HYGIENIC CORD CARE PRACTICES AMONG MOTHERS IN NNEWI, NIGERIA

KEY WORDS

Newborn, cord care, hand-hygiene, Anambra, South-East,

ABSTRACT

Background: Neonatal sepsis is a major contributor to the high burden of neonatal deaths in sub-Saharan African countries like Nigeria. Hygienic cord care has the potential to reduce neonatal mortality from infections.

Aim: A cross sectional study was conducted among consenting mothers to determine hygienic cord care practices including hand washing.

Methods: Mothers were interviewed using semi-structured interviewer- administered questionnaires. Data was analyzed using SPSS version 21. P-value < 0.05 was considered statistically significant.

Result: 214 mothers with mean age of 29.6 ± 5.53 years were studied. The rate of hand washing before, after, before and after, and neither before nor after cord care were 81.3%, 76.2%, 68.7% and 11.2%, respectively. Majority of the mothers practiced cord care activities for ≥3 times (79.9%), did not re-use swabs for cleaning the cord (92.5%) and used methylated spirit for cord care (89.3%). However, only one mother (0.5%) used chlorhexidine gel for cord care while half did not practice cord care after each diaper change. Factors significantly associated with practice of hand washing recommendations were access to health education during pregnancy, knowledge of the consequence of poor cord care, and use of antiseptic agent for cord care.

The respondents had a fairly good practice of hygienic cord care. However, many babies still face the risk of sepsis due to failure of their mothers to practice hand washing as recommended

before and after cord care, and after diaper change. Intensive promotion of cord care is endorsed, in addition adherence to standard hand washing recommendations before and after cord care.

1. INTRODUCTION

Every day, approximately 6700 newborn infants less than 28 days die, accounting for 47% of under-five deaths globally.[1] More than 99% of these deaths occur in low and middle income countries.[1] A child born in sub-Saharan Africa or in Southern Asia is 10 times more likely to die in the first month than a child born in high-income countries.[2] In 2019, Nigeria had the second highest burden of neonatal mortality globally.[2] This high burden of neonatal deaths translates to the high burden of under-five mortality. Currently, Nigeria is ranked first among the countries where a child is most likely to die before the fifth birthday worldwide, 32% of which occur during the neonatal period.[3] These deaths are largely preventable through application of simple measures such as hygienic delivery practices and cord care. According to the most recent National Verbal Autopsy Study report, nearly half (47.3%) of all neonatal deaths in the country are from infective causes such as sepsis, pneumonia, meningitis, diarrhea, tetanus.[4]

The umbilical cord stump serves as an important portal of entry for both local and systemic neonatal infections. It could be colonized rapidly by pathogens from contaminated hands and environment. In addition, the umbilical vessels remain patent for few days after birth serving as pathway for bacteria that cause neonatal sepsis to enter the blood stream.[5,6] Regular maternal hand-washing during the first 14 days of life has been associated with reductions in omphalitis and all-cause neonatal mortality by 44% and 24% respectively.[7-9] Therefore, hand hygiene has been recommended as an essential component of infection prevention and control in the newborn.[5,6,10,11] The World Health organization recommends hand hygiene specifically before and after handling the newborn, before and after cord care, and after diaper changing.[11] This could be achieved by simply washing the hands with soap and water. However, the extent to which mothers adhere to this hand hygiene recommendation during cord care has not been well established in Nigeria.

In spite of these recommendations large numbers of neonates continue to die from cord infections in developing countries such as Nigeria. This study was therefore conducted to determine the hand washing compliance of mothers seen in immunization clinics in Nnewi.

2. MATERIALS AND METHODS

2.1 Study area

A cross-sectional study was conducted to determine the practice of hand washing among mothers of infants presented for vaccination at immunization clinics in Nnewi. The study was conducted in September 2021 in public health facilities located in the 4 neighborhoods in Nnewi (Otolo, Uruagu, Umudim and Nnewichi).[12] The public health facilities included 8 health posts/clinics, 16 primary health care centers (PHCs), one secondary level facility, one tertiary institution (Nnamdi Azikiwe University Teaching Hospital). All the facilities provide vaccination services to children. Nnewi is a one town local government area (Nnewi North LGA) and the 2nd largest commercial city in Anambra State.[12] According to 2018 National Demographic and Health Survey report, 90% of deliveries in Anambra State take place in health facilities while 82% of mothers receive post-natal care within 48 hours of delivery.[13] The study was carried out in selected PHCs and the only tertiary health facility, and was part of a study to examined mother's knowledge of cord care recommendations and actual cord care practices.

2.2 Sample size determination

Sample size was calculated using the formula for sample size determination for cross-sectional studies (n=Z2pq/d2). Z is standard normal variate at 95% confidence interval (1.96), p is expected proportion in the population based on previous study (0.13), q is complementary probability (q=1-p=0.87), d= precision =0.05.20 Minimum sample size of 193 (rounded off to 200) was obtained after addition of 10% to accommodate incomplete responses.

2.3 Study population and sampling technique

Eligible respondents were mothers > 18 years of age, who had lived in Nnewi for ≥ 6 months, had at least one biologic child less than one year of age and gave a written informed consent. The respondents were recruited using a stratified sampling technique. The PHC were first stratified according to the 4 neighborhoods in Nnewi. Thereafter, one PHC was selected from each neighborhood using simple random sampling technique. Respondents were proportionately recruited from the only tertiary facility and 4 selected PHC. The number of respondents allotted

to each selected facility was determined by multiplying the average number of infants vaccinated in the facility per month by the sampling fraction (sample size ÷ total number of infants vaccinated in the 5 facilities per month). In each facility, eligible respondents were recruited by convenient sampling until allotted sample size was attained

2.4 Data Collection and analysis

The study tool was a semi-structured pretested interviewer-administered questionnaire. Data was collected by 3 trained research assistants who were Paediatrics senior resident doctors. All respondents gave a written informed consent after due explanation of the nature of the study. Data was analyzed using SPSS version 21. The associations between categorical variables were examined using Chi-square test while Fisher's exact test was used where conditions for Chi-square was violated. P-value less than 0.05 was considered statistically significant.

3. RESULTS AND DISCUSSION

3.1 Results

Two hundred and fourteen mothers were interviewed. Their mean age was 29.6 ± 5.53 years while the mean age of their infants was 4.4 ±2.93 months. The male:female ratio of their infants was was 1:1. As shown in Table 1, most of the mothers had at least secondary school education (93.5%), were income earners (83.2%), received ante-natal care (83.1%) or delivered in a facility which had skilled healthcare providers. During pregnancy with the index baby, 80.4% of the mothers received health education on cord care. About three-quarter of the mothers correctly cited infection as a consequence of poor cord care while 89.3% used a standard method of cord care (cleaning with methylated spirit).

Washing of hands both before and after every cord care was practiced by 68.7% of mothers as shown in Table 1. Relationship between maternal characteristics and hand washing before and after cord care is shown in Table 1. Mothers below 20 years, with no formal or primary

education, were unemployed, had ANC in a traditional birth attendant or delivered in a tertiary facility had the lowest proportion of women who washed hands before and after cord care. However, these relationships did not attain statistical significance.

Table 1: Maternal characteristics and practice of recommended hand hygiene

Characteristics	**Hand washing before and after cord care**		**Total (%)**	**p-value**
	Yes	**No**		
Age (years)				
<20	1(33.3)	2(66.7)	3(1.4)	0.346
20 - 29	73(68.9)	33(31.1)	106 (49.5)	
30 - 39	69(71.1)	28(28.9)	97 (45.3)	
≥40	4(50.0)	4(50.0)	8 (3.7)	
Highest educational level				
No formal education or primary	9(64.3)	5(35.7)	14 (06.5)	
Secondary	82(68.3)	38(31.7)	120(56.1)	
Post- secondary	56(70.0)	24(30.0)	80(37.4)	0.906
Occupation				
Unemployed/student/apprentice	21(58.3)	15(41.7)	36 (16.8)	
Trader	63(67.0)	31(33.0)	94(43.9)	0.459
Artisan	22(73.3)	8(26.7)	30(14.0)	
Civil servant	33(75.0)	11(25.0)	44(20.6)	
Professionals	8(80.0)	2(20.0)	10(4.7)	
Place of ante-natal care				
TBA/Maternity (private)	20(55.6)	16(44.4)	36(16.9)	
PHC(public)	31(79.5)	8(20.5)	39(18.2)	0.165
Secondary level (private)	74(71.8)	29(28.2)	103(48.1)	
Tertiary (public)	22(61.1)	14(38.9)	36(16.8)	
Place of delivery				
TBA/Maternity (private)	24(61.5)	15(38.5)	39(18.2)	
PHC(public)	35(83.3)	7(16.7)	42(19.6)	0.081
Secondary level (private)	70(68.6)	32(31.4)	102(47.7)	
Tertiary (public)	18(58.1)	13(41.9)	31(14.5)	
Health education on cord care				
Yes	125(72.7)	47(27.3)	172(80.4)	0.011*
No	22(52.4)	20(47.6)	42(19.6)	
Method of cleaning the cord				
Antiseptic agent (methylated spirit)	138(72.3)	53(27.7)	191(89.3)	0.001*
Others (hot compress or salt solution etc)	9(39.1)	14(60.9)	23 (10.7)	
Correctly cited infection as consequence of poor cord care				

Yes No	118(72.8) 29(55.8)	44(27.2) 23(44.2)	162 (75.7) 52(24.3)	0.021*
Total (%)	**147(68.7)**	**67 (31.3)**	**214(100.0)**	

TBA=Traditional birth attendant *PHC=Primary Healthcare center* *Statistically significant

The frequency of cord care ranged from once to 12 times daily with a median of 4 (IQR 2) times. As shown in Figure 1, 11.2% of mothers neither washed hands before or after the cord acre while 68.7% washed on both times. Majority of the mothers practiced cord care activities for 3 or more times (79.9%) and did not reuse swab for cleaning the cord (92.5%). About half of the mothers (50.9%) did not practice cord care after each diaper change while 10.7% of them used unorthodox methods of cord care.

Figure 1: Practice of hand washing in relation to cord care among the mothers

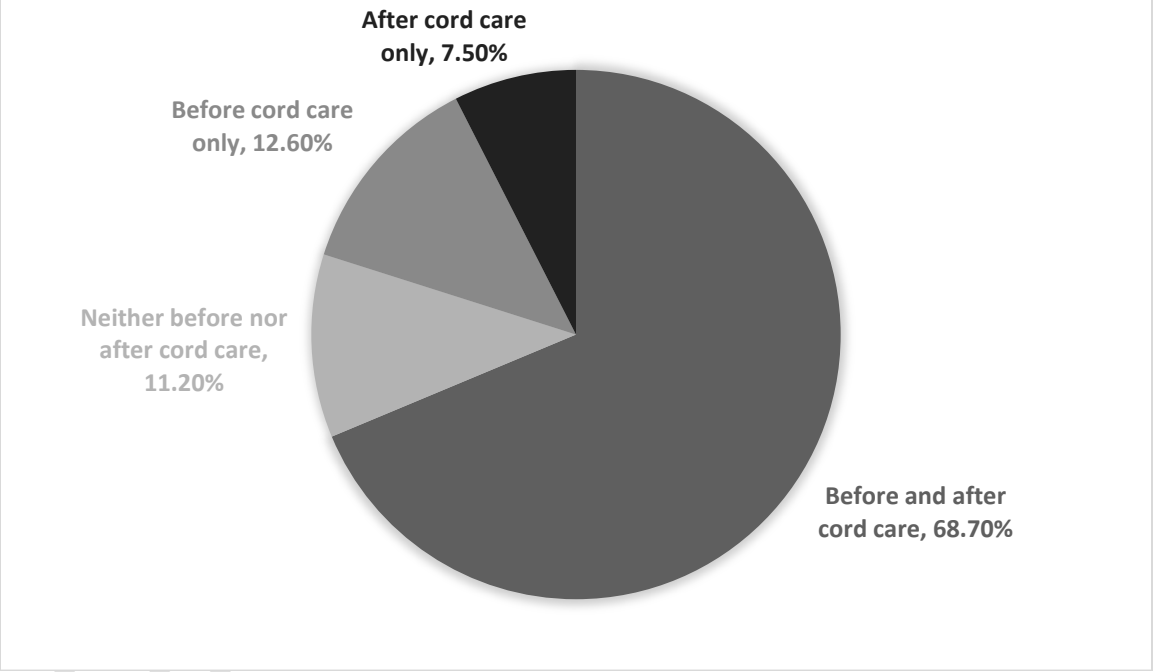

Table 2: Cord care practices of the mothers

Frequency of cord care per day		
1 to 2	43	20.1
3 to 4	111	51.9
5 to 6	41	19.2
≥7	19	8.9
Cord care after each diaper change		
Yes	105	49.1
No	109	50.9
Reuse of swab for cord care		
Yes	16	7.5
No	198	92.5
Cord care practice (multiple response)		
Cleaning with methylated spirit	191	89.3
Hot compress	53	24.8
Home-made Solutions (Salt or seasoning cube)	3	1.4
Tooth paste	19	8.9
Dusting powder	7	3.3
Petroleum jelly	71	33.2
Penicillin ointment	6	2.8
Household ash	3	1.4
Chlorhexidine gel	1	0.5
Breastmilk	1	1.5
Oils	4	1.8

3.2 DISCUSSION

The practice of hand washing before cord care by a substantial proportion (81.3%) of the mothers implies a good effort at preventing umbilical stump infection. The findings are

comparable to other African reports.[14,15] In Benin Nigeria, 86.9% of mothers were found to wash hands before cord care.[14,15] The above reports are in contrast to a Nigerian observational study which reported "no hand hygiene action" for 81% of home cord contact activities.[16] Although the later study was observational in nature with minimal possibility of recall bias, the limited sample size (16 cord contacts) and high dropout rate limits the generalizability of the findings.

Despite hand washing practice by a substantial proportion of mothers before cord care, a fifth of them fell short of standard recommendations. The finding that 11.2% washed hands neither before nor after cord care is a source of concern given the potential high risk of infections to their infants. In an earlier report, mothers' practice of hygienic cord care was found to be strongly influenced by nurses.[14] This could be attributed to delivery of health talks at antenatal clinics, by nurses. The relationship between health education and hand hygiene was strongly demonstrated in this study as a significantly higher proportion of mothers who had access to health education on cord care washed hands according to WHO recommendation. Access to information during health education may also explain the significant relationship between practice of hand washing recommendations and using standard methods of cord care as well as citing infection as a consequence of unhygienic cord care. It is believed that information on both areas is also gathered during the health education. There is no doubt that knowledge influences practice. It behooves the health worker, therefore, to ensure that every pregnant woman receives counselling on hygienic cord care, with emphasis on hand washing with soap and water both before and after cord care.

Health talks should be strengthened at ante-natal clinic visits to ensure that every pregnant mother is reached with messages on the benefits of hand washing during postnatal home care. The finding that almost all pregnant women access ante-natal care from a health facility guarantees the success of this approach. The fact that most mothers deliver in a health facility can also be leveraged upon by incorporating messages on hygienic cord care into discharge protocols. There should be clear messages on the fact that hand washing prevents infection since this knowledge was found to positively influence adherence to hand washing recommendation. The above efforts should target not only the public but also the private facilities which accounted for about two-thirds of antenatal clinic attendance and deliveries in this study. In addition, mass media channels such as radio jingles should be employed to achieve a wider reach. Health

education interventions have been proven to be very effective in low and middle income countries.[17,18] In Bangladesh, mothers who were randomized to receive intensive perinatal promotion of handwashing with soap washed hands 4 times more frequently than controls.

The lack of a statistically significant relationship between adherence to hand washing recommendations and educational status, occupation, place of ANC or place of delivery was surprising. However, this buttresses the fact that health education was of utmost importance irrespective of the socio-economic status and other parameters. Although not explored in the index study, previous reports indicate that most mothers in developing countries such as Nigeria, Bangladesh and Cambodia perceive use of only water to be adequate and often rinse hands with only water rather than thoroughly washing them with soap and water.[16,19-21] Therefore, health education, should include key requirements for effective hand washing such as use of soap and clean water, as well as hand washing technique.

The respondents demonstrated a fairly good practice as regards other indicators of hygienic cord care such as cord care frequency, avoidance of re-use of swabs, use of antiseptic agent for cord care. The frequency of at least 3 times per day by almost 80% of mothers agrees with reports from Ghana and Uganda but is higher than frequencies reported in Plateau State Nigeria and Ethiopia.[22-25] Methylated spirit has been documented as the most popular agent for cord care in Nigeria.[5,25-28] However, the finding that only one mother (0.5%) used chlorhexidine gel, 5 years after its national scale-up, and much lower than 18.3% reported for South-East Nigeria is quite discouraging.[5] This reflects poor status of chlorhexidine scale up in the region and calls for concerted efforts to ensure effective implementation of the national scale-up plan.

Soiled diaper is a major source of bacteria for potential umbilical stump colonization. It has been suggested that cord care should be practiced after each diaper change especially if the cord is visibly soiled with faeces.[29] However, this is perceived to delay cord separation as some gut bacterial flora is felt to enhance the process. This may explain the practice of cord care by only half of the mothers in the index study following a diaper change. Many reports and recommendations are silent on cord care with respect to diaper change. Therefore, more studies are needed to establish benefit of cord care after diaper change. This will inform recommendations on cord care in relation to diaper change.

4. CONCLUSION

A considerable proportion of the respondents practiced recommended hand washing before and after cord care. This was positively influenced by access to health education during pregnancy, knowledge of the consequence of poor cord care, and use of antiseptic agents for cord care. The respondents had a fairly good practice with respect to other indicators of hygienic cord care.

Intensive promotion of standard cord care practices is recommended to eliminate the non-adherence to hand washing recommendations for cord care.

LIMITATION

Our study was limited by failure to determine quality of hand washing as well as other methods of hand hygiene. In addition, the practice of hand washing was based on verbal reports by the mothers. This is prone to recall bias and possibility of over-estimation of rate of hand washing. However, the findings are in keeping with previous African studies and provide insight into the level of hand washing and possible interventions to improve maternal postnatal handwashing practices.

CONSENT

All respondents gave a written informed consent to participate in the study

ETHICAL APPROVAL

Approval for this study was obtained from the Research Ethics Committee of Nnamdi Azikiwe University Teaching Hospital (NAUTH) Nnewi, Anambra State.

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