Umbilical Cord Care Practices and Cord Care Education of Mothers Attending Health Care (Pakistan Prospect)

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Abstract

Neonatal mortality is of global concern, it is the death in the first month of life. According to WHO, 2.4 million children died globally in the first month of life2. Globally the neonatal mortality rate declined slowly from 28/100 live births in 2000 to 17.9/100 live births in 2019. It is a major challenge for the low socioeconomic group of countries. Most neonatal deaths occurred in south Asia and African countries, in 2019 out of 2.4 million death 81% occurred in the Southeast Asia. Objective: To evaluate and improve cord care practices of mothers to reduce the risk of cord related infections. Methodology: The mixed method will be used in this research, questionnaire is used for data collection, total collected sample is 391. Results: 354 (91.0%) of the 394 patients analyzed obtained prenatal care (ANC) in both traditional and non-traditional settings. Among these, 288 (72.3%) got cord care health education, whereas 106 (27.7%) did not. The overall documentation of the instructions for the use of metabolized spirits alone included 116 (48.9%) teaching institutions and 103 (43.5%) private hospitals. the average results show the age of the baby 1 - 7 days, the average age of the mother is 18 - 25 years. The average education of the mothers is primary. Participation of health centers is average. Most of the participants has 1 child. Conclusion: This research concludes the poor umbilical cord practices and knowledge. Those with information used it better. Raise awareness about umbilical cord care and improper behaviors, including using mentholated balms. Before women leave the hospital,

they should learn cord care. Mothers must clean wires. Several healthcare organizations don't provide cord care instruction, and what they provide isn't research-based.

Keywords

Knowledge, Mothers, Newborns, Practices, Umbilical Cord Care

1. Introduction

Neonatal mortality is of global concern, it is the death in the first month of life [1]. The WHO reported (2019) 2.4 million infants died globally in the first month of life that makes 47% of all under five deaths with 75% occurring in the first week of life and one third died on the first day of life [2]. Majority of the deaths occur in low socioeconomic countries, south Asia and Africa account for 75% of the total neonatal deaths [3] neonatal mortality rate in Pakistan is 248 per thousand. The leading causes of neonatal mortality are preterm baby, perinatal asphyxia, sepsis and congenital anomalies. Sepsis is the third major culprit of mortality in the first month after birth [4] and is considered a major public health issue. The clinical spectrum ranges from subclinical infections to a severe debilitating systemic infection causing morbidity and mortality. The neonates are at increased risk of sepsis because of decrease maturity of immune system, maternal colonization with group B streptococcus [5] the newly cut umbilical cord serves as a pathway for the entrance of microorganisms leading to infection ranging from omphalitis to severe sepsis.

Ensuring and administering the recommended cord care practices can significantly reduce neonatal morbidity and mortality caused by sepsis [5] WHO recommends applying 7.1% chlorhexidine every day on cord stump for newborn delivered at home in suboptimal conditions whereas clean, dry cord care is recommended for newborns delivered at healthcare facilities and at home with optimal neonatal care conditions [6].

The daily application of chlorhexidine is linked to a 23% drop in neonatal mortality as compared to a control group [7]. One study compares the application of chlorhexidine along with dry cord care for reducing neonatal mortality, concluded that those who received daily chlorhexidine application on cord stump have decrease risk of umbilical cord infection and neonatal death [8].

2. Objectives

The following is the most important objective of this study.

To evaluate and improve cord care practices of mothers to reduce the risk of cord related infections.

3. Literature Review

Neonatal mortality is termed death during the first month after birth. It is of

great concern globally and an essential component in the sustainable development goals, although decreasing but the progress is still slower, mainly in the developing countries [9]. According to WHO, 2.4 million children died globally in the first month of life. Globally the neonatal mortality rate declined slowly from 28/100 live births in 2000 to 17.9/100 live births in 2019 [10]. It is a major challenge for the low socioeconomic group of countries. Most of neonatal deaths occurred in south Asia and African countries, in 2019 out of 2.4 million death 81% occurs in the Southeast Asia and sub-Saharan Africa [11].

Neonatal mortality is higher than its neighboring countries, in 2018 the NMR in Pakistan was 42 per 100 live births whereas in India it was 23/1000 live births, in Iran 9/1000 live births, in Pakistan the highest perinatal and neonatal mortality is observed in Punjab with NMR of 47.3/1000 live births followed by Baluchistan with a rate of 42.8/1000 live births, in KPK it is 39.6/1000 live births whereas in Sindh it is 36/1000 live births. This risk is greater in villages than in cities [12] [13].

There are multiple causes responsible for neonatal mortality. Worldwide, about one third of these deaths are attributed to prematurity, problems during birth process and infectious causes that include sepsis, pneumonia etc. Neonatal sepsis is systemic infection that happens in the first month of life. Clinically presented with fever, hypothermia, difficulty breathing, lethargy, poor feeding, poor neonatal reflexes, abdominal distention, vomiting diarrhea, tachycardia, bradycardia, increased capillary refill time, signs of decreased perfusions, seizures, obtundation, oliguria, renal and liver failure etc. [14] Sepsis is further classified into early onset neonatal sepsis that occurs within 48 hrs to 7 days, late onset neonatal sepsis occur from 7 to 28 days the most common organisms are staphylococcal aureus and e coli, kleibseilla, pseudomonas, salmonella and GBS [15] [16].

The incidence load of newborn sepsis is more in developing countries and where regular surveillance is not observed. Globally sepsis accounts for 27.5% of neonatal deaths [15]. Globally NNS occurs in 1 to 50 per 1000 live births resulting in 3% to 30% of neonatal deaths annually.

A study in Tanzania showed that majority of neonatal deaths was caused by perinatal asphyxia, accounts for 22.3%, followed by respiratory distress accounts for 20.8%, LONNS (late onset neonatal sepsis accounts) [17].

There are various factors that increases the risk of newborn sepsis that presence of meconium in amniotic fluid, amnionitis, history of the STDs in mother, UTI in mother, prematurity, lower birth weight, vascular catheter and poor umbilical cord practices [18].

Poor cord practices significantly increase the risk for infections in the first month after birth. Proper clean cord care has shown to decrease the risk of infections and subsequently the overall neonatal mortality [19]. Various malpractices have been observed regarding umbilical cord care. A study in Zambia showed the use of petroleum jelly, body lotions, breast milk, and cooking oil,

cow dung, mud on cord stump and the use of unclean blade for cutting the cord [20].

A study in AJK showed that sterilized string has been used for cord tying in about 27% in the rural and 44% in the urban areas. Whereas sterilized blade has been used for cord cutting in 23% in rural areas and 31% in urban areas. The cord care practice was poor in villages as compared to cities [21]

4. Methodology

The qualitative and quantitative method is used in this cross-sectional study, this study carried out at the district of province KP (Mardan district). Data is retrieved from mothers attending the healthcare with infants aged 1 to 4 weeks. The study population is mothers with infant aged 1 to 4 weeks using multi stage cluster sampling. Sample size is calculated using the proportionate sample size formula

$$n = Z\alpha/22 * p * (1 - p)/MOE2$$

The confidence for the study was considered at 95%, and prevalence (*p*) of good cord care is taken as 61.4% 22 from previous study, margin of error taken as 5%. The estimated sample size for this study is 356, however after adding 10% non-response rate, the sample size was finalized as 391.

Data is collected through a preformed questionnaire that will include demographic variables such as mother's age, baby age, place of residence, education, parity. Responses regarding cord care practices is recorded and 2 score is awarded to correct response and 0 to in correct response. A score above 50th centile is regarded as good cord care practices. Health education about cord care is given to mother during first visit and responses is recorded and analyze at 2nd visit for routine immunization or inquire telephonically. All the collected data is analyzed in SPSS. Mean with standard deviation is calculated for continuous variables like age of mother, age of baby, parity. Frequencies and percentages are calculated for categorical variables such as education status of mother, socioeconomic status, place of delivery, cord care practice.

Cord care practices before health education regarding cord care and after health education is assessed and a paired t test is applied to see for any correlation between health education and good cord care practice. Effect modifiers like mother's age, parity, socioeconomic status, place of delivery, knowledge about cord care is controlled by stratification. Post stratification chi square test is applied in which p value of <0.05 is considered significant. All results are presented in the form of tables and graphs.

5. Results and Discussion

Descriptive Statistics

Table 1 represents, the age of the babies in different groups. The age groups are 1 - 7 days, 8 - 14 days, 15 - 21 days, and 22 - 27 days. In this table the age group 1

- 7 frequency is 44.1%, 8 - 14 age group frequency is 36.1%, 15 - 21 age group frequency is 11.2% and 22 - 27 age group frequency are 8.6%. In this study, the highest frequency % age group was 1 - 7 days the lowest frequency % age group 2 was 2 - 27 days, clearly shown tin he above table.

Table 2 represents the age of the mother in different groups. The age groups are 18 - 25 years, 26 - 32 years, 33 - 40 years, and above 41 years. In this table the age group 18 - 25 year frequency is 37.5%, 26 - 32 age group frequency is 34.1%, 33 - 40 age group frequency is 16.6% and above 41 group frequency is 11.7%. In this study, the highest frequency % age group was 18 - 25 years, and the lowest frequency % age group above 41 years, clearly shown in the above table.

Table 3 represents the health facility of different health centers. The health centers are Punjab, Sindh, Baluchistan, Gilgit Baltistan, AJK, and DHQ hospital Mardan In this table the frequency Punjab is 17.0%, Sindh frequency is 20.7%, Baluchistan frequency is 19.8% and Gilgit Baltistan frequency is 21.0%, AJK frequency is 21.34%. In this study the average frequency % of all RHCs is 21.34%.

Table 1. Age of baby.

	Frequency	Percent
1 - 7 Days	154	44.1
8 - 14 Days	126	36.1
15 - 21 Days	39	11.2
22 - 27 Days	30	8.6

Table 2. Age of mother.

	Frequency	Percent
18 - 25 year	147	42.1
26 - 32 year	126	36.1
33 - 40 year	50	14.3
Above 41 years	26	7.4

Table 3. Health facility.

	Frequency	Percent
Punjab	59	17.0
Sindh	72	20.7
Baluchistan	69	19.8
Gilgit Baltistan	73	21.
AJK	74	21.34

Figure 1 represents the education level of the mother. This part is divided in different level of education like uneducated, Primary, Middle, Intermediate, and Graduate levels. The table also shows the frequencies of these levels. The frequency of the uneducated level is 12.6%, Primary level frequency is 30.1%, middle-level frequency is 18.3%, intermediate level frequency is 17.2% and the last one graduate level frequency is 21.8%. In this table highest level frequency is 30.1% and the lowest frequency is 12.6%, clearly shown in the table.

Table 4 shows the number of children of the mother. This table also shows the numbers and its frequency. 1st child frequency is 36.4%, 2nd child frequency is 31.5%, 3rd child frequency is 12.3%, 4th child frequency is 9.7% and more then 5th child frequency is 10%. The highest frequency level is 1st child frequency 36.4%.

This **Table 5** shows the place of delivery. In this table we study two places one is Home based and the second is Health based facility. In this table we also show the frequencies of these places. The frequency of Home-based delivery is 47.3% and the frequency of Health based delivery is 52.7%. In this table the highest frequency is 52.7% which is clearly shown in the table.

Table 6 represents the knowledge provider of the study. The providers are Relatives, Trained birth attendants Health care professional. The frequencies of these providers: Relatives is 47.0% frequency; trained birth Attendants is 39% frequency and Health care professional is 14% frequency, clearly shown in the above table.

Table 7 represents the Material used for cord tying. The material is used for cord tying is cord clamp and others. This table also shows the frequency of these materials of cord tying. The frequency of cord clamp is 44.8% and the others frequency is 55.2%, which is clearly defined in the above table.

Table 8 represents the instruments used for cord cutting. This table shows the two groups of instruments sterile blade and other. It also shows the frequency of these instruments. The frequency of Sterile blade is 54.4% and the other frequency is 45.6%. The average frequency is sterile blade 54.4%.
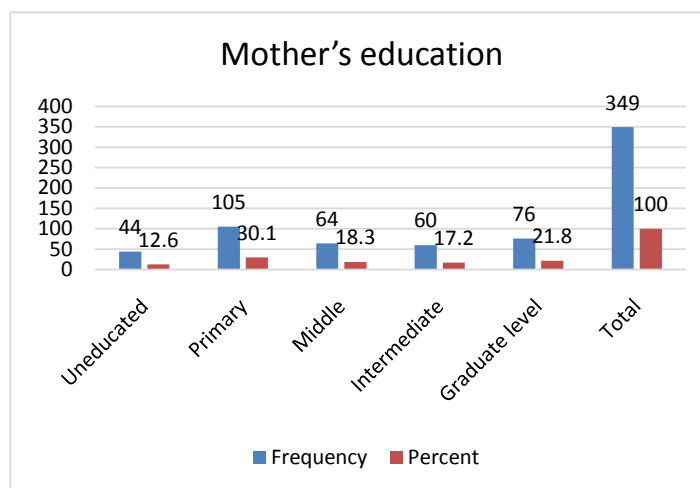

Figure 1. Mother's education.

Table 4. No of child.

	Frequency	Percent
1 child	127	36.4
2 children	110	31.5
3 children	43	12.3
4 children	34	9.7
More Then 5	35	10.0

Table 5. Place of delivery.

	Frequency	Percent
Home based	165	47.3
Health facility	184	52.7

Table 6. Place of delivery.

	Frequency	Percent
Relatives	164	47.0
Trained Birth Attendants	136	39.0
Health care Professional	49	14.0

Table 7. Material used for cord tying.

	Frequency	Percent
cord clamp	157	45.0
others	192	55.0

Table 8. Instruments used for cord cutting.

	Frequency	Percent
Sterile blade/surgical blade	246	70.5
Others	103	29.5

Below **Table 9** shows the study of Proper hand washing before and after cleaning the cord. The following tables shows the 55.9% samples are doing proper hand washing before and after cleaning cord and 44.1% are not doing these practices.

Below **Table 10** shows the substances used on cord care. These substances are Chlorhexidine, Methylated spirit, Dry cord care. The frequencies of these substances is Chlorhexidine 47%, Methylated spirit is 39% and the Dry cord care frequency is 14%. The highest frequency in this study is 47% and the lowest is 14%.

Table 11 shows the frequency of cord cleaning. In this table we take two groups one is Thrice daily and the second is once daily. The frequency of thrice

daily is 53.6% and the frequency of once daily is 46.4% which is clearly describe in the above table.

Below Table 12 represent the Cord Care Practice Quality. In this table we take two Qualities Good and Poor and these frequencies. The frequency of Good is 47.3% and the frequency of Poor quality is 52.7%.

Following Table 13 represent the health education about cord care practices. In this table there are 5 sub section clearly mentioned in the table. The 1st section is Use of chlorhexidine/methylated spirit/clean cord care has 29.8% 2nd is use of cord clamps for tying the cord is 28.7% 3rd is hand washing before cleaning the cord is 16.9% 4th is cod cleaning three times daily is 10.6% and 5th one is use of surgical blades for cutting the cord is 14.0%.

Table 9. Proper hand washing before and after cleaning the cord.

	Frequency	Percent
Yes	195	55.9
no	154	44.1

Table 10. Substance used on cord care.

	Frequency	Percent
Chlorhexidine/ Methylated spirit/ Methylated spirit	228	65.3
Mud or others	121	34.7

Table 11. Frequency of cord cleaning.

	Frequency	Percent
Thrice daily	187	53.6
Once daily	162	46.4

Table 12. Cord care practice.

	Frequency	Percent
Good	165	47.3
poor	184	52.7

Table 13. Health education about cord care.

	Frequency	Percent
Use of chlorhexidine/ methylated spirit/clean cord care	104	29.8
Use of cord clamps for tying the cord	100	28.7
Hand washing before cleaning the cord	59	16.9
Cord cleaning three times daily	37	10.6
Use of surgical blade for cutting the cord	49	14.0

6. Discussion

The results of this study show that the County Pakistan and its provinces have showed that the majority of the respondents in this study had poor understanding of umbilical cord care. This may be because the women understand more from watching other people take care of the cord than from formal instruction. Despite the fact that more than half said they had a primary education, their income indicates that they belong to a low socioeconomic level. Comparable research from South India also revealed that mothers' understanding of cord care was lacking [22]. In addition, a study of women in various tehsils revealed that little was known about how to care for the umbilical cord.

Selected five provinces of Pakistan, however, revealed that although most of them had good overall methods and understanding of umbilical cord care, there were gaps in area of [23]. The participants in this study performed umbilical cord care well, however they continued to apply illegal substances, such as mentholated, to the cord. Since this was a facility-based study, many people saw how to properly clean the clinics, yet using mentholated balm has long been a tradition that has been challenging to change. According to research by Aamer Imdad *et al.*, daily use of chlorhexidine reduces newborn mortality by 23% when compared to a control group. In one research that compared the use of chlorhexidine with dry cord care to lower infant mortality, individuals who received daily applications of chlorhexidine to the cord stump had a lower risk of both umbilical cord infection and neonatal death.

According to research by Agrawal *et al.*, newborn mortality was noticeably lower in those who received clean cord care (36.5/1000 live births; 95% confidence interval: 28.0 to 46.8) than in those who did not (53.0/1000 live births; 95% confidence interval: 46.1 to 60.6). (OR = 0.63; 95% CI 0.46 to 0.87) The infant mortality was 37% lower in the group receiving clean cord care [24].

The way a cord stump is treated varies by geography, culture, and customs. Typically, traditional behaviors are dangerous. The adoption of improved cord care methods may sometimes be hindered by these traditions. Umbilical cord stumps have been covered with cow manure, which raises the possibility of newborn tetanus. Some people applied butter and other unsuitable items.

Around 24 lac newborns worldwide die away during the first 28 days after birth. In Pakistan, 248 newborns per 1000 do not survive beyond one week old. Neonatal mortality should be less than 12 per 1000, as stated in SGD objective 3.2. Unfortunately, progress toward achieving this aim is very sluggish and calls for study and effective actions against the factors that may be avoided that lead to newborn mortality.

The results of the study show, the age of the babies in different groups. The age groups are 1 - 7 days, 8 - 14 days, 15 - 21 days, and 22 - 27 days. In this table the age group 1 - 7 frequency is 44.1%, 8 - 14 age group frequency is 36.1%, 15 - 21 age group frequency is 11.2% and 22 - 27 age group frequency are 8.6%. In this study, the highest frequency % age group was 1 - 7 days the lowest frequen-

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Table 2 represents the age of the mother in different groups. The age groups are 18 - 25 years, 26 - 32 years, 33 - 40 years, and above 41 years. In this table the age group 18 - 25 - year frequency is 37.5%, 26 - 32 age group frequency is 34.1%, 33 - 40 age group frequency is 16.6% and above 41 group frequency is 11.7%. In this study, the highest frequency % age group was 18 - 25 years, and the lowest frequency % age group above 41 years, clearly shown in the above table.

Table 3 represents the place of residence of the study population. There are two tehsils, Tehsil Mardan and Tehsil Takht Bhai. In this table, the frequency of tehsil Mardan is 43% and the frequency of tehsil Takht Bhai is 57%. In this study, the highest frequency 57% is Tehsil Takht Bhai and the lowest frequency % is Tehsil Mardan.

Table 4 represents the health facility of different health centers. The health centers are Punjab, Sindh, Baluchistan, Gilgit Baltistan, AJK, and DHQ hospital Mardan In this table the frequency Punjab is 10.3%, Sindh frequency is 14.0%, Baluchistan frequency is 13.2% and Gilgit Baltistan frequency is 14.3%, AJK frequency is 14.6% and DHQ hospital Mardan frequency is 33.5%. In this study the average frequency % of all RHCs is 33.5%.

When performing market research, cross tabulation is often utilized as a technique of data analysis since it helps clarify relationships between variables that are otherwise obscure. The dependent variable in the table above is cord practices, whereas the independent variable is the baby's age, which is defined as a distinct category. This is 1 to 7 days old. There are 76 cord care education sessions for mothers and 78 umbilical cord care practices. When the Age is 8 to 14 days 47 cord care education for mothers and 79 umbilical cord care practices are carried out, when the infant is 15 to 21 days old There are 12 cord care education sessions for mothers and 27 umbilical cord care practices, between 22 and 27 days of age 13 Umbilical Cord Care Procedures and 17 Mothers' Cord Care Education are Executed.

Cord practices are whereas dwelling location is the independent variable. Only 5 cord care education of mother's practices are carried out in THQs 145 umbilical cord care procedures. 52 umbilical cord care practices and 147 cord care education of mother's practices are carried out in THQs.

When the Place of delivery, home based then 161 Umbilical Cord Care Practices are just 4 Cord Care Education of Mothers practices are performed. When the Place of delivery, health facility/hospitals then 36 Umbilical Cord Care Practices are just 148 Cord Care Education of Mothers practices are performed.

7. Conclusions

This research has shown that the mothers' practices and understanding of the care of the umbilical cord were poor. Those that had access to information on cord care used it more effectively. It is necessary to put strategies in place to in-

crease awareness of umbilical cord care and improper behaviors, such as using mentholated balms, which should be severely avoided. Before women leave healthcare centers, health professionals should make every effort to show proper cord care to the moms. Mothers need to understand how important it is to clean cords correctly with the suitable substance.

Several healthcare institutions don't provide cord care health education, and when it does, some of the instruction isn't supported by research. It is also possible to employ mass media (both print and internet) to reach a broader audience. It is important to take use of the chance to provide women with evidence-based, verified information on healthy cord care practices throughout the prenatal period while utilizing antenatal clinics as comfortable settings. To reduce or completely do away with the uncertainty that mothers now experience, a consistent approach to cord care should be implemented.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

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