

KNOWLEDGE ATTITUDES AND PRACTICES OF MOTHER REGARDING CARE OF NEWBORN UMBILICAL CORD

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ABSTRACT

Background: Appropriate umbilical cord care is critical in preventing neonatal morbidity and mortality. Maternal knowledge, attitudes, and practices (KAP) significantly influence cord care outcomes, yet gaps remain in many low- and middle-income countries. **Objective:** To assess the knowledge, attitudes, and practices of mothers regarding newborn umbilical cord care. **Study Design:** Cross-sectional study. **Setting:** Conducted in the Department of Pediatrics at GMC DHQ Hospital, Dera Ismail Khan, Pakistan. **Duration of Study:** 04-March-2024 to 04-September-2024. **Methods:** A total of 175 mothers of neonates aged 1–30 days were recruited through non-probability consecutive sampling. Data were collected using a structured questionnaire assessing maternal knowledge (13 items), attitudes (13 items), and practices. Scores were categorized as "high" ($\geq 50\%$) or "low" ($< 50\%$). Data were analyzed using SPSS version 22. Chi-square test was applied, and a p-value < 0.05 was considered statistically significant. **Results:** The mean age of neonates was 15.56 ± 8.73 days, and the mean maternal age was 28.77 ± 5.66 years. Overall, 62.2% of mothers demonstrated high knowledge and attitude scores, whereas only 21% had good practice scores. Higher maternal education level and socioeconomic status were significantly associated with better knowledge and practice scores ($p < 0.05$). **Conclusion:** While most mothers showed adequate knowledge and positive attitudes toward umbilical cord care, practices remained suboptimal. Community-based awareness and reinforcement programs are crucial for promoting hygienic cord care practices and reducing the risk of neonatal infections.

Keywords: Newborn Care, Umbilical Cord Care, Maternal Knowledge, Neonatal Infections

INTRODUCTION

The neonatal period is the most vulnerable stage in a child's life, with infections contributing significantly to morbidity and mortality in developing countries (1). Among these, umbilical cord infections are particularly common, often stemming from improper cord care practices immediately after birth (2). The umbilical stump, if not managed hygienically, can serve as a gateway for life-threatening pathogens, leading to conditions such as omphalitis and sepsis (3). While evidence-based guidelines for cord care exist, including dry cord care or the application of antiseptics such as chlorhexidine in high-risk settings, these recommendations are often overlooked due to cultural beliefs, inadequate maternal education, and limited access to healthcare information (4-6).

The neonatal period symbolizes a critical phase for a child's survival, during which neonates come across the greatest risk of mortality within the initial month of life. Worldwide, 2.4 million infants fall victim throughout their first month, representing 47% of all fatalities among children under 5 years of age. In Sub-Saharan Africa, the neonatal mortality rate attained a concerning Figure of 27 deaths per 1,000 live births (7).

In many communities, traditional methods such as applying ghee, ashes, or herbal pastes to the cord are still practiced, increasing the risk of infection (8). Maternal knowledge, attitudes, and practices (KAP) regarding cord care have a significant influence on newborn health outcomes. Educated mothers and those exposed to health education sessions are generally more likely to adopt safe cord care practices. However, knowledge alone may not be sufficient; positive attitudes and actual behaviours are equally important (9, 10). A study found that approximately 48.9% of participants washed their hands with water and soap before and after cleaning the umbilical cord. Additionally, 47.9% indicated that they cleaned the cord base before cleaning the surrounding skin, while only 7.9% reported not applying anything to the umbilical cord to aid in the healing process. A

significant 95.2% indicated that they bathed their newborn before the cord detached, whereas merely 44.4% opted for sponge bathing. The overall practice score indicated that only 21% demonstrated good cord care practices (11).

The rationale of this study is to determine the Knowledge, attitudes, and practices of mothers regarding the care of the newborn umbilical cord. Knowledge, attitude, and practice of nursing mothers towards cord care significantly influence the child's health outcomes. Inadequate care of the umbilical cord may result in infection. The assessment of our population's current status through this study will help us develop strategies to enhance education on cord care for mothers.

METHODOLOGY

Our study employed a cross-sectional design, conducted in the Department of Pediatrics at GMC DHQ Hospital, Dera Ismail Khan, from March 4, 2024, to September 4, 2024, following ethical approval. Participants were selected using non-probability consecutive sampling. The sample size was determined using a 95% confidence level, 4% absolute precision, and a minimum expected frequency of correct responses of 7.9% from a previous study (11), resulting in a sample size of 175 mothers.

Mothers of children aged 1 to 30 days, regardless of the child's gender, were included in the study. These mothers were recruited from the hospital's well-baby and vaccination clinics. Mothers with psychiatric disorders or those using medications for central nervous system conditions were not included in the study.

Data collection commenced after obtaining consent. Demographic details, such as the mother's age, educational level, and the family's socioeconomic status, were recorded. A structured questionnaire, administered in the local language, was used to collect data on knowledge, attitudes, and practices related to umbilical cord care. The

interviews were conducted privately in isolated OPD rooms to maintain confidentiality.

The questionnaire we used consisted of 13 items to assess knowledge, attitudes, and practices. Correct responses were scored one point, while incorrect answers received zero points. A total score of 50% or above indicated high knowledge or good practices, whereas scores below 50% were categorized as low knowledge or poor practices. The questionnaire's validity was supported by its prior use in similar studies.

Data collected from the patients were analyzed by SPSS 22.0. The age of the mother and child was calculated using the mean and SD. Socioeconomic status, mother's education, knowledge, attitude, and practice scores were presented as frequencies and percentages. The Chi-Square test was used to assess the association between knowledge, attitude, and awareness and demographics. P-value was kept notable at ≤ 0.05 .

RESULTS

The mean age of babies was 15.56 ± 8.739 days, and the mothers were 28.77 ± 5.659 years. Among the babies, 106 (60.6%) were male, while 69 (39.4%) were female. The remaining demographic information is presented in Table 1.

In terms of knowledge and attitude scores, we observed that 103 mothers (58.9%) achieved a high score, while 72 (41.1%) scored low. For practice scores, 42 (24.0%) mothers scored high ($>50\%$), whereas the majority, 133 (76.0%), scored low ($<50\%$) (Table 2).

A major association was observed between knowledge and attitude scores and certain demographic factors. For instance, mothers with higher education levels, such as matriculation or above, were more likely to achieve high knowledge and attitude scores (25, 24.3%) compared to illiterate mothers (22, 21.4%), with a notable significance ($P = 0.00001$). Similarly, mothers were more likely to score high, with 31 (30.1%) of high-income fathers' families achieving high scores compared to 21 (20.4%) from low-income families ($p = 0.0001$) (Table 3).

When examining practice scores, education level, and socioeconomic status again played significant roles. Mothers with higher education (matriculation or above) had better practice scores, 16 (38.1%), compared to illiterate mothers, 9 (21.4%) ($P = 0.01$). Similarly,

mothers from middle-income families (22, 52.4%) showed higher scores than those from low-income families (7, 16.7%), with a statistically significant difference ($P = 0.01$) (Table 4).

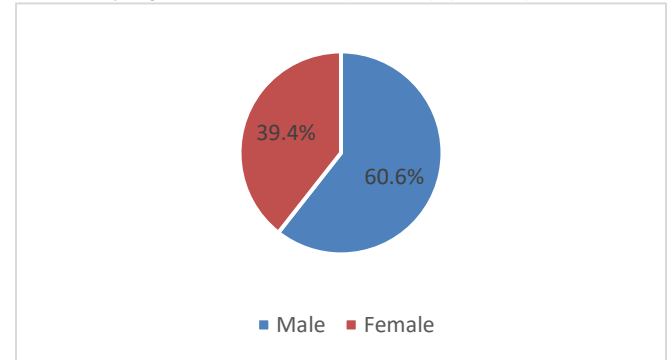


Figure 1: Gender of the babies

Table 1: Demographics of the patients

Demographics		N	%
Gender of the baby	Male	106	60.6%
	Female	69	39.4%
Education level	Illiterate	60	34.3%
	Primary	41	23.4%
	Secondary	38	21.7%
	Matric & above	36	20.6%
Socioeconomic status of the father	Low ($< 20K$ Rs/Month)	62	35.4%
	Middle ($<20-50K$ Rs/Month)	68	38.9%
	High ($> 50K$ Rs/Month)	45	25.7%

Table 2: Knowledge/attitude and practice score

		N	%
Knowledge and attitude score	High score	103	58.9%
	Low score	72	41.1%
Practice score	High score ($>50\%$)	42	24.0%
	Low score ($<50\%$)	133	76.0%

Table 3: Stratification of knowledge and attitude score with demographics

Demographics		Knowledge and attitude score				P value
		High score		Low score		
		N	%	N	%	
Gender of the baby	Male	60	58.3%	46	63.9%	0.45
	Female	43	41.7%	26	36.1%	
Education level	Illiterate	22	21.4%	38	52.8%	0.00001
	Primary	26	25.2%	15	20.8%	
	Secondary	30	29.1%	8	11.1%	
	Matric & above	25	24.3%	11	15.3%	
Socioeconomic status of father	Low (< 20K Rs/Month)	21	20.4%	41	56.9%	0.0001
	Middle (<20-50K Rs/Month)	51	49.5%	17	23.6%	
	High (> 50K Rs/Month)	31	30.1%	14	19.4%	
Age of baby (Days)	1 to 15	52	50.5%	39	54.2%	0.63
	15 to 30	51	49.5%	33	45.8%	
Age of mother (Years)	18 to 30	58	56.3%	45	62.5%	0.41
	> 30	45	43.7%	27	37.5%	

Table 4: Stratification of practice score with demographics

Demographics		Practice score				P value
		High score (>50%)		Low score (<50%)		
		N	%	N	%	
Gender of the baby	Male	25	59.5%	81	60.9%	0.87
	Female	17	40.5%	52	39.1%	

Education level	Illiterate	9	21.4%	51	38.3%	0.01
	Primary	8	19.0%	33	24.8%	
	Secondary	9	21.4%	29	21.8%	
	Matric & above	16	38.1%	20	15.0%	
Socioeconomic status of father	Low (< 20K Rs/Month)	7	16.7%	55	41.4%	0.01
	Middle (<20-50K Rs/Month)	22	52.4%	46	34.6%	
	High (> 50K Rs/Month)	13	31.0%	32	24.1%	
Age of baby (Days)	1 to 15	23	54.8%	68	51.1%	0.68
	15 to 30	19	45.2%	65	48.9%	
Age of mother (Years)	18 to 30	27	64.3%	76	57.1%	0.41
	> 30	15	35.7%	57	42.9%	

DISCUSSION

In our study, the mean age of mothers was 28.77 ± 5.659 years, with 60.6% of newborns being male. A high proportion of mothers (34.3%) lacked formal education, and more than 35% came from a low-income background. While 58.9% demonstrated adequate knowledge of cord care, only 24% reported high practice scores, indicating a gap between theoretical understanding and the practical application of cord care. These results mirror trends observed by Ndikom et al. in Nigeria, who found that 48.1% of mothers had good cord care knowledge; however, in contrast, 61.4% practiced appropriate care, yet they also demonstrated harmful practices, such as applying mentholated balm, which persisted (12). Similarly, Edeker et al. noted that 80% of mothers understood the basics of cord care, but 94% relied on warm saline water instead of the recommended antiseptics (13). These parallels suggest that while awareness campaigns can improve knowledge, deeply rooted cultural practices often undermine adherence to evidence-based guidelines.

Education emerged as a crucial factor in the outcomes across studies. In our analysis, mothers with higher education levels, such as those who completed matriculation or above, were more likely to achieve high knowledge scores (24.3%) compared to illiterate mothers (21.4%). This aligns with findings from Kalufya et al., who observed that mothers with no formal education had 15.4 times higher odds of poor knowledge than those with higher education (11). Similarly, Memon et al. in Pakistan reported that illiterate mothers scored 14.3% lower on knowledge assessments than educated peers (14). These consistent findings underscore the role of education in enabling mothers to comply with health advice and resist harmful traditions such as applying substances as herbs to the cord stump.

Socioeconomic status also influenced the outcomes in our research. In the current study, 35.4% of fathers had lower income, and families in this group had lower knowledge scores. This resonates with Kalufya et al., who found that wealthier urban mothers had better access to health facilities, leading to safer practices. They also reported that multipara women had better practices. In low-resource settings, financial constraints may limit the ability to purchase medicines or travel to clinics, even when knowledge is available. In the rural areas of Pakistan, the low-income class is mostly uneducated, and they follow the traditions passed down from generation to generation regarding antenatal care. These practices can increase the risk of infection.

Healthcare access and antenatal education were pivotal. Mothers who receive information on cord care during antenatal visits tend to adopt better practices. Ndikom et al. showed that 67.5% of mothers in their study cited health workers as their primary source of information (12). However, Kalufya et al. found that even among mothers delivering in health facilities, fewer practiced optimal cord care, suggesting that provider communication may be insufficient until the information is put into practice by the mother. This gap indicates a need for standardized training programs for healthcare workers to reinforce WHO guidelines during both antenatal and postnatal visits. Our study's low practice scores compared to knowledge scores suggest that knowledge alone is not sufficient to drive behavioral change. This aligns with Kalufya et al., who found that most mothers had adequate

knowledge but fewer practiced proper care (11). We suggest that to enable mothers to provide adequate care of the cord, the elders in their communities must be educated on the subject first, then the mothers. Expanding maternal education programs is a pressing need of the hour, particularly in rural and low-income areas, which could significantly enhance health literacy.

CONCLUSION

In conclusion, in our study, the majority of the women (58.9%) had good knowledge and attitude scores, while fewer (24%) had good scores for practicing the care of newborns' umbilical cords. We found that individuals from lower socioeconomic backgrounds and those with weaker educational backgrounds were associated with lower scores in knowledge, attitude, and practice.

DECLARATIONS

Data Availability Statement

All data generated or analysed during the study are included in the manuscript.

Ethics approval and consent to participate

Approved by the department Concerned. (IRB-78/GJMS)

Consent for publication

Approved

Funding

Not applicable

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

AUTHOR CONTRIBUTION

SAMIA AMINA (Resident Pediatrician)

Conception of Study, Development of Research Methodology Design, Data Collection, Study Design, Revision of manuscript, Manuscript drafting, and Final approval of manuscript.

FARMAN ULLAH BURKI (Professor)

Study Design, Supervision of entire process, Conception of Study, Final approval of manuscript.

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