Factors Associated with Maternal and Neonatal Health Care Practices: A Study from Nepal

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ABSTRACT

Background: Maternal and neonatal health problem is a major public health burden. Most of the newborn deaths in the developing countries occur due to lack of access to care. The main objective of the study was to assess and identify the factors associated with maternal and neonatal health care practices in Chitwan, Nepal.

Methods: An analytical & descriptive cross-sectional study was conducted among 157 mothers having a child below one year.

Results: The study showed that the mean age of the mothers and mean age during the marriage was 24 years. Almost all the mothers had used safe delivery kit (97.5%). Almost all of the mothers applied the substance on the umbilical cord with the application of Chlorhexidine on the umbilical cord found to be 98.4%. Bathing time after 24 hrs., breastfeeding within 1 hour, colostrum feeding was found to be 94.3%, 69.4% & 96.2% respectively. Place of the delivery, education status, maternal age, and delivery types are the associated factors with neonatal health care practices whereas bathing time was not found significant.

Conclusion: Neonatal health care practices are still not satisfying and poor. In rural areas, there is a more prevalent of poor and unsafe neonatal health care practices. Health programs focusing on mothers and more research works should be conducted to promote safe neonatal health care practices in low income developing countries.

Keywords: neonatal care practices, maternal health, breastfeeding, Nepal, delivery

INTRODUCTION

Maternal and Neonatal health problem is one of the major public health issues in developing countries. During the first 28 days of life, the child is at highest risk of dying. It is thus crucial that appropriate feeding and care are provided during this period, both to improve the child's chances of survival and to lay the foundations for a healthy life. [1] The World Health Organization's (WHO) guidelines for essential newborn care include the following: hygiene during delivery, keeping the newborn warm, early initiation of breast-feeding, exclusive breast-feeding, care of the eyes, care during illness, immunization and care of low birth-weight newborn. [2]

Warmth and appropriate hygiene in handling newborns, early and exclusive breastfeeding, umbilical cord care, eye care, Vitamin K administration, and immunization are all key components of essential newborn care. [3]

The Ministry of Health and Population, Nepal has developed a series of recommendations for newborn care that focus on use of safe delivery kits, cord care,

prevention and management of hypothermia, drying and bathing the newborn, and other health care services. As of 2011, the Community-Based Newborn Care Program (CB-NCP) in Nepal has been implemented in 15 districts (NDHS 2011). [4] Based on the National Neonatal Health Strategy, the CB-NCP, Nepal recommends the following practices to promote newborn care:

1. Wiping the newborn with a soft, dry cloth immediately after birth.
2. Putting the newborn on the mother's chest and initiating skin-to-skin contact.
3. Initiation of breastfeeding and exclusive breastfeeding for up to six months.
4. Not applying anything on the cord stump.
5. Bathing the newborn only after 24 hr post-birth.

Problem of the statement

Globally, four million newborns die before they reach one month of age. The neonatal period is only 28 days yet it accounts for 38% of all deaths under 5 years of age. Three quarters of neonatal deaths happen in the first week after birth. [5] Globally, the main direct causes of neonatal death are estimated to be preterm birth (28%), severe infections (26%), and asphyxia (23%). Neonatal tetanus accounts for a smaller proportion of deaths (7%), but is easily preventable. Low birth weight is an important indirect cause of death. [6]

Neonatal healthcare in Nepal

It is estimated that in Nepal nearly 50,000 children under one year of age die every twelve months. Two third of them die within 28 days of age, resulting in over 30,000 neonatal deaths per year. Among those dying within the neonatal period, 20,000 (two third) die in the first week of life. [2] Neonatal mortality rate (NMR) is 33 per 1000 live birth. The major causes of neonatal deaths in Nepal are Infection, Birth Asphyxia, Preterm birth & Hypothermia. (NDHS, 2011). [4]

Nearly ninety percent of women deliver at home and 55% deliver with the assistance of a friend or relative. Only 9% of home delivery used clean delivery kits. A health worker assists only 13% of deliveries. Breastfeeding is almost universal in Nepal and continues for a mean of 29 months but immediate and exclusive breastfeeding is often not practiced and colostrum is discarded in nearly a third of cases. Forty percent of neonates received a prelacteal feeding, and initiation of breastfeeding is delayed for more than 24 hours for a third of neonates. [7] High burden of maternal and neonatal mortality rate in developing countries like Nepal indicates the urgency and need of the specific research study focusing on maternal and neonatal health. Our study aims to investigate the factors associated with the new born and maternal care practices that accelerate the neonatal mortality & poor growth of the neonates.

METHODOLOGY

Analytical &descriptive cross sectional study was conducted among 157 mothers having children under one year in Saradanagar, Chitwan district of Nepal. Study sample size were selected by simple random sampling method based on the national report study of prevalence of breastfeeding within an hour of birth in central development region of Nepal (70.62%) conducted by Department of Health Services, Nepal. [8]

Neonatal care practices were taken as dependent variable whereas age, family income, sex of the child, education level, income, place of delivery, age at marriage was considered as independent variables.

Face to face interview was done with mothers having children under one year. A semi-structured questionnaire was used for the data collection. Data analysis was done using SPSS version-20. Cross tabulations of the variable were performed. Statistical significance was determined using Pearson's Chi-square test.

Ethical approval was taken from Chitwan Medical College- Ethical Review committee (CMC-IRC) &permission was also taken from District Public Health Office (DPHO), Chitwan, Nepal. The questionnaire was pretested; modifications were done if needed. The questionnaire was back-translated English to the Nepali language. Verbal consent was taken from each respondent and the confidentiality of the received information was maintained.

RESULTS
Socio-Demographic information
Majority of respondents were (51%) below 25 years with mean age of 24.8±4 years. The response rate was 100% (N=157). 95.5% of mothers reported that they were below 25 years at first pregnancy with (Mean age of marriage = 19.5±3 years).Majority of respondents have a secondary level of education. More than half of the respondents had an extended family. Respondents having single children and more than two children found to be 55.4% & 44.6% respectively. Study found that 55.4% of respondents were house wife and remaining respondents mostly relied on agriculture as the main income source.

Neonatal healthcare practices
Majority of respondents chosen health institution for place of the delivery (93.6%). Most of the delivery of the child was found to be normal (79.6%). Among the case of the home delivery (6.4%), almost all of the delivery was assisted by family members. Almost all had used safe delivery kit. Most of respondents had applied Chlorhexidine on umbilical cord. Regarding bathing time, majority of respondents had given bath after 24 hours and mentioned cleanliness was the major reason.

Table 1: Neonatal healthcare practices

Variables	Frequency (N)	Percent
Anything applied to umbilical cord		
Yes	154	98.1
No	3	1.9
Things applied to umbilical cord (n=154)		
Chlorhexidine	150	97.4
Oil or turmeric	4	2.6
Bathing time		
Before 24 hours	9	5.7
After 24 hours	148	94.3
Reason for bathing baby before 24 hours (n=9)		
For cleanliness	8	88.8
Due to tradition	1	11.2
Initiation of Breastfeeding		
Within 1 hour	109	69.4
After 1 hour	48	30.6
Colostrum feeding		
Yes	151	96.2
No	6	3.8
Reason for discarding colostrum feeding		
Perceive it as dirty	2	33.33
Taboos	1	16.67
Baby was at ICU	1	16.67
Due to release of pus	1	16.67
Baby was suffering from Pneumonia	1	16.66

Association between neonatal health care practices and independent variables
Our study investigates the association between independent variables (age, cultural, education status, income, family size, delivery place etc.) with neonatal care practices. Our study found the significant relationship between place of delivery with any things applied to umbilical cord of neonates (P<0.001) whereas other factors found to be not statistically significant. Among the all of the factors we studied in our research, only the Use of safe delivery kit was found to be statistically significant with the place of delivery (p<0.001).

Table 2: Association between Social determinants and Neonatal health care

Factors	Use of Safe delivery kit (N=157)			Anything applied to umbilical cord (N=157)		
	Yes (%)	No (%)	p-value	Yes (%)	No (%)	p-value
Age of the respondents <25 ≥25	78(97.5) 75(97.4)	2(2.5) 2(2.6)	0.999	79(98.8) 75(97.4)	1(1.2) 2(2.6)	0.615
Age at marriage <25 ≥25	146(97.3) 7(100)	4(2.7) 0(0)	0.999	147(98) 7(100)	3(2) 0(0)	0.999
Age at childbirth <25 ≥25	89(97.8) 64(97)	2(2.2) 2(3)	0.999	90(98.9) 64(97)	1(1.1) 2(3)	0.573
Ethnicity Brahmin/Chhetri Others	47(94) 106(99.1)	3(6) 1(0.9)	0.096	47(96) 106(99.1)	3(4) 1(0.9)	0.238
Religion Hindu Non-Hindu	121(96.8) 32(100)	4(3.2) 0(0)	0.583	122(97.6) 32(100)	3(2.4) 0(0)	0.999
Educational status Illiterate Literate	7(87.5) 146(98)	1(12.5) 3(2)	0.190	7(87.5) 147(98.7)	1(12.5) 2(1.3)	0.146
Family type Nuclear Extended	55(96.5%) 98(98)	2(3.5) 2(2)	0.622	56(98.2) 98(98)	1(1.8) 2(2)	0.999
Sex of the child Male Female	69(95.8) 84(98.8)	3(4.2) 1(1.2)	0.333	70(97.2) 84(98.8)	2(2.8) 1(1.2)	0.594
No of living child Single child Two or more child	86(98.9) 67(95.7)	1(1.1) 3(4.3)	0.325	86(98.9) 68(97.1)	1(1.1) 2(2.9)	0.586
Birth Order First child Second and above	85(98.8%) 68(97.2%)	1(1.2) 3(2.8)	0.329	85(98.8) 69(97.2)	1(1.2) 2(2.8)	0.590
Monthly income (NRS) Less than 50,000 50,000 or greater	121(96.8) 32(100)	4(3.2) 0(0)	0.583	122(97.6) 32(100)	3(2.4) 0(0)	0.999
Place of delivery Home Health institution	6(60) 147(100)	4(40) 0(0)	<0.001*	7(70) 147(100)	3(30) 0(0)	<0.001*
Types of delivery Normal Others than normal	121(96.8) 32(100)	4(3.2) 0(0)	0.583	122(97.6) 32(100)	3(2.4) 0(0)	0.999
Delivery Assistance (in case of home delivery, n=10) Family/Relatives SBA	5(55.6) 1(100)	4(44.4) 0(0)	0.999	6(66.7) 1(100)	3(33.3) 0(0)	0.999

Statistically Significant at p-value <0.05.

Educational status and place of delivery was the major associated factors with bathing time of newborn care. Study showed the significant association of new born practices with education status of respondents (p<0.05) and place of delivery (p<0.001). Others factors found to be statistically not significant. Initiation of breastfeeding was found to be statistically significant with age of respondents (p=0.010), age at childbirth(p=0.041) and the types of delivery(p<0.001) but place of delivery, delivery assistance and educational status of respondents wasn't found to be associated with breastfeeding initiation.

Our study investigates to find out the association between all related factors and colostrum feeding during neonatal care practices. But none of the socio demographic factors wasn't found to be statistically significant with colostrum feeding. Study shows no any association of colostrum feeding with place of delivery, delivery type and delivery assistance.

Table 3: Association between Social determinants & Neonatal health care

Factors	Bathing time (N=157)			Initiation of Breastfeeding (N=157)			Colostrum feeding (N=157)		
	Before 24 hours	After 24 hours	p-value	Within 1 hour	After 1 hour	p-value	Yes (%)	No (%)	p-value
Age of respondents <25 ≥25	4(5%) 5(6.5%)	76(95%) 72(93.5%)	0.743	63(78.7%) 46(59.7%)	17(21.2%) 72(40.3%)	0.010*	78(97.5) 73(94.8)	2(2.5) 4(5.2)	0.437
Age at marriage <25 ≥25	9(6%) 0(0%)	141(94%) 7(100%)	0.504	105(70%) 4(57.1%)	45(30%) 3(42.9%)	0.438	144(96) 7(100)	6(4) 0(0)	0.589

Table 3 to be continued...									
Age at childbirth									
<25	5(5.5%)	86(94.5%)	0.880	69(75.8%)	22(24.2%)	0.041*	89(97.8)	2(2.2)	0.239
≥25	4(6.1%)	62(93.9%)		40(60.6%)	26(39.4%)		62(93.9)	4(6.1)	
Ethnicity									
Brahmin/Chhetri	4 (8%	46(92%)	0.403	34(68%)	16(32%)	0.791	50(100)	0(0)	0.178
Others	5(4.7%)	102(95.3%)		75(70.1%)	32(29.9%)		101(94.4)	6(5.6)	
Religion									
Hindu	6(4.8%)	119(95.2%)	0.321	85(68%)	40(32%)	0.443	121(96.8)	4(3.2)	0.603
Non-Hindu	3(9.4%)	29(90.6%)		24(75%)	8(25%)		30(93.8)	2(6.2)	
Educational status									
Illiterate	2(25%)	6(75%)	0.016*	6(75%)	2(25%)	0.725	7(87.5)	1(12.5)	0.189
Literate	7(4.7%)	142(95.3%)		103(69.1%)	46(30.9%)		144(96.6)	5(3.4)	
Family type									
Nuclear	5(8.8%)	52(91.2%)	0.216	40(70.2%)	17(29.8%)	0.878	54(94.7)	3(5.3)	0.669
Extended	4(4%)	96(96%)		69(69%)	31(31%)		97(97)	3(3)	
Sex of the child									
Male	4(5.6%)	68(94.4%)	0.999	50(69.4%)	22(30.6%)	0.996	69(95.8)	3(4.2)	0.999
Female	5(5.9%)	80(94.1%)		59(69.4%)	26(30.6%)		82(96.5)	3(3.5)	
No of living child									
Single child	4(4.6%)	83(95.4%)	0.513	59(67.8%)	28(32.2%)	0.625	84(96.6)	3(3.4)	0.999
Two or more child	5(7.1%)	65(92.9%)		50(71.4%)	20(28.6%)		67(95.7)	3(4.3)	
Birth Order									
First child	4(4.7%)	82(95.3%)	0.732	59(68.6%)	27(31.4%)	0.806	84(97.7)	2(2.3)	0.411
Second and above	5(7%)	66(93%)		50(70.4%)	21(29.6%)		67(94.4)	4(5.6)	
Monthly income (NRS)									
Less than 50,000	9(97.6%)	116(2.4%)	0.118	86(68.8%)	39(31.2%)	0.736	119(95.2)	6(4.8)	0.348
50,000 or greater	0(0%)	32(100%)		23(71.9%)	9(28.1%)		32(100)	0(0)	
Place of delivery									
Home	5(50%)	5(50%)	<0.001*	6(60%)	4(40%)	0.504	9(90)	1(10)	0.292
Health institution	4(2.7%)	143(97.3%)		103(70.1%)	44(29.9%)		142(96.6)	5(3.4)	
Types of delivery									
Normal	7(5.6%)	118(94.4%)	0.888	96(76.8%)	29(23.2%)	<0.001	121(96.8)	4(3.2)	0.603
Others than normal	2(6.2%)	30(93.8%)		13(40.6%)	19(59.4%)		30(93.8)	2(6.2)	
Delivery Assistance (in case of home delivery, n=10)									
Family/Relatives	5(55.6%)	4(44.4%)	0.999	6(66.7%)	3(33.3%)	0.197	8(88.9)	1(11.1)	0.999
SBA	0(0%)	1(100%)		0(0%)	1(100%)		1(100)	0(0)	

Statistically Significant at p-value <0.05.

DISCUSSION

In our study, more than half of the respondents were less than 25 years. The median age of respondent was 24 years. In this study regarding educational study, 31.8% had completed primary level. Regarding religion, 79.6% were Hindu. The findings of this study were contrast to the study done in India where 23% of respondents were of age group 20-24 years. The median age of respondent was 18 years. [9] Only 9% of respondents had completed primary level. And only 69% were Hindu. Our study found that 54.1% of respondents having female child. The study was similar to the study done by Tura et al (2015) where 48.6% were female. [10] Our study result showed that 93.6% respondents had institutional delivery and 79.6% respondents had a normal delivery. The study findings from Ethiopia were similar where 78.8% respondents had institutional delivery & 95.6% respondents had a normal delivery. [11]

Neonatal Health Care Practices

Daily chlorhexidine application to the umbilical cord stump during the first week of life is recommended for newborns who are born at home in settings with high neonatal mortality (30 or more neonatal deaths per 1000 live births). Clean, dry cord care is recommended for newborns born in health facilities and at home in low neonatal mortality settings. [12] Our study showed that major use of the chlorhexidine among respondents was normal and effective. But the study done conducted by Coffey PS and Brown SC (2016) indicates that cord-care practices is not consistent throughout low and middle-income countries, yet existing literature depicts a firm tradition of umbilical cord care in every culture. [13] Similar findings from Rural Zambia concluded that locally appropriate behavior

change interventions should aim to promote chlorhexidine in place of commonly-reported application of harmful substances to the skin and umbilical cord, reduce bathing of newborns at night and address the immediate bathing of HIV-infected newborns. [17]

In our study, 69.4% of respondents had early initiation of breastfeeding within one hour as similar to the findings of study of Kaphle et al. (2013) which revealed that 51.35% of respondents had early initiation of breastfeeding practices. Regarding Colostrum Feeding, our study revealed that 96.2% of respondents had fed Colostrum milk which is almost similar (90.54%) to the study from Kaphle et al. [14] Concerning the bathing time, this study showed that 94.3% of respondents bathed their baby after 24 hours which is almost similar to the study of Chaudhary et al (2013) which revealed that 96.6% of respondents bathed their baby after 24 hours. In our study, substance applied to umbilical cord showed that almost all of respondents had applied substance (chlorhexidine / oil or turmeric) which is opposite to that of Chaudhary et al. study which revealed that only 5% of respondents had applied substance on cord. [15]

Study done in Bangladesh (2011) and India (2016) showed the significant association of skilled attendance at delivery with several newborn care practices [16] [19] but our study didn't found any relationship between delivery done by trained attendance with any of the new born care practices. Compared to mothers with secondary and primary education, mothers having higher education were breastfeeding within one hour of delivery, [15] marital status and education are significantly associated whereas mother with good knowledge on essential newborn care are significantly associated with mothers' practice of essential newborn care [11] which was similar to our study finding.

Previous studies from Sinha RC (2013) and Acharya SR (2014) found the statistical significance between place of delivery, education status, delivery attendance. [9] [20] Our study findings also showed the strong association of education status, place of delivery with newborn care practices. Furthermore, no any relationship of place of delivery with breastfeeding [20] which agree to our study finding. Study conducted in 2014 revealed the prevalence of essential newborn practices on safe cord care and optimal thermal care was exceptionally low in Northern Ghana. Based on the study, main predictors of good neonatal practices were maternal age, antenatal care &maternal knowledge of newborn care. [18] Our study showed the better prevalence of newborn care practices by showing the significant relationship of knowledge level and age of the mothers.

CONCLUSION

New-born care is very important to reduce the neonatal mortality and promoting the health of neonates. Maternal and child health is one the major burden of public health problem in developing countries like Nepal. Our study investigated and found that the neonatal health care practices is still not satisfying and poor. In rural area, there is a more prevalent of poor and unsafe neonatal health care practices. Place of the delivery, education status, maternal age and delivery types are the associated factors with neonatal health care practices. The local and central government should integrate and implement the key public health care programs for improving and promoting the safe neonatal health care practices. Since mothers plays the vital role for neonatal health, community based proper training and education program focusing the community mothers should be conducted. More in-depth & broad spectrum research in different settings is strongly recommended.The findings of the study will be helpful for planning neonatal care practices for government, health planners, health workers and others respective authorities.

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