



ISSN: 2091-2749 (Print)  
2091-2757 (Online)

#### Correspondence

Prof. Dr. Kedar Baral  
Department of Community  
Health Sciences,  
Patan Academy of Health  
Sciences, Lalitpur, Nepal  
Email: kedarbaral@pahs.edu.np

#### Peer Reviewed By

Prof Dr. Jay N Shah  
Patan Academy of Health  
Sciences

#### Peer Reviewed By

Dr. Ashis Shrestha  
Patan Academy of Health  
Sciences

## Assessing neonatal care practices in rural Nepal

Tania Rezai,<sup>1</sup> Kedar Baral,<sup>2</sup> Samir Koirala,<sup>3</sup> Sudarshan Paudel,<sup>4</sup>  
Saraswati Kache<sup>5</sup>

<sup>1</sup>Santa Rosa Family Medicine Residency, Stanford University,  
<sup>2</sup>Professor, <sup>3</sup>Lecturer, <sup>4</sup>Assistant Professor, Department of  
Community Health Sciences, Patan Academy of Health Sciences,  
Lalitpur, Nepal

<sup>5</sup>Associate Professor, Pediatric Critical Care and Director,  
Pediatric Global Health Education Program, Stanford University

#### ABSTRACT

**Introduction:** Child health indicators of under-five and infant mortality has improved in Nepal, but neonatal mortality remains high. The aim of this study is to assess neonatal care practices among mothers in rural Nepal.

**Methods:** A household survey was conducted in the village of Daman in Makwanpur district, Nepal. All households that had an infant less than one year of age, and had been residing in Daman for greater than six months were included in the study.

**Results:** There were 117 mothers with neonate assessed. The average age of mothers was 24 years and 39 (33.3%) were illiterate, 53 (45.3%) were home births and 36 (30.8%) births were registered. Ninety seven (82.9%) neonates cried immediately after birth, 95 (81.1%) used a new or boiled blade for umbilical cord, 20 (16.7%) applied oil to the cord stump and 71 (61%) breastfed within first hour of birth. There was a significant relationship between non-exclusive breastfeeding and sickness.

**Conclusions:** In Daman village community awareness for umbilical cord care and breastfeeding after birth was high. For thermal regulation of the infant, more health education is required.

**Keywords:** birth practice, birth registration, breast feeding, neonatal care, pregnancy

## INTRODUCTIONS

Neonatal deaths in Nepal account for more than half of all deaths within the first year of life.<sup>1</sup> In the last two decades, Nepal has achieved a significant reduction in mortality of children from one month to five years of age; but Neonatal Mortality Rate (NMR) remains persistently high at 32 per thousand live birth.<sup>2-4</sup> Thirty to fifty percent of newborns in Nepal are underweight, which increases the risk for neonatal morbidities and mortality.<sup>5</sup>

Studies have shown lack of trained healthcare providers in the rural areas, and unwillingness to serve in remote areas.<sup>2,6,7</sup> In rural areas 86% of births occur at home without skilled birth attendant and 70% of rural births go without a postnatal visit.<sup>1</sup> This study assess awareness of newborn care in a rural community of Daman village, Makwanpur district Nepal.

## METHODS

The aim of this study was to assess the Early Neonatal Care (ENC) practices within the rural Village Development Committee (VDC) of Daman in the Makwanpur district of central Nepal. A household survey was conducted to include all households with infants less than one year of age, and whose family had been residing in Daman for more than six months. One year was used as a cut off to ensure an accurate recall of events during the neonatal period. The questions were targeted specifically to the mothers, but in circumstances where there were other family members present during the birth, they also contributed information in elucidating delivery and newborn care practices.

The survey was first piloted in a different VDC of similar geographic and socioeconomic background in Makwanpur district and modified accordingly prior to initiation of the study. The VDC of Daman is divided into nine separate wards, each of which has an assigned Female Community Health Volunteer (FCHV). The FCHVs assisted the research team in identifying households in their ward that

met the inclusion criteria. A snowballing method was used to ensure that all qualifying households were captured. Demographic parameters: mother's age, mother's age at first child, age of infant during interview, parent's education, birth registration and distance from health center were recorded. Early neonatal care like drying, stump care, initiation of breast feeding, pre-lacteal feed and acute childhood illness were recorded. Child having acute respiratory infections and/or diarrhea were recorded.

The local Primary Health Center (PHC) designated wards 1 through 6 as being more centralized with easier accessibility and was named as "near," whereas wards 7 through 9 were considered to be remote with greater barriers to care and was named as "far" for this study.

## RESULTS

There were a total of 117 surveys collected out of the 129 eligible households within Daman VDC. The most common reason why eligible households could not be included was that the mother and infant had left to stay in the maternal home shortly after delivery- a practice which is common in rural Nepal.

**Table 1. Demographic Information of Households surveyed in Daman, Makwanpur, Nepal**

	Average	S.D.	Range
<b>Mother's Age</b>	24.3	+/- 4.58	16 – 40
<b>Mother's Age at First Child</b>	20.67	+/- 2.81	15 – 35
<b>Child's Age</b>	5.6 months	+/- 3.51	2 days – 11 months
<b>Education</b>	<b>Percent of sample (n=117)</b>		
Illiterate/Sign Name	39 (33.3%)		
Elementary	19 (16.2%)		
Secondary and above	59 (50.4%)		
<b>Birth Registration</b>			
Yes	36 (30.8%)		
No	81 (69.2%)		
<b>Distance from Health Center</b>			
Near (Wards 1 – 6)	82 (70.1%)		
Far (Wards 7 – 9)	25 (29.9%)		

### *Delivery of babies*

There were total 117 deliveries, 53 (45.3%) occurred at home and 64 in health institutions: 34 (53.1%) in larger hospitals in Makwanpur or Kathmandu, 30 (46.9% of 64 institutional delivery, and 25.6% of total 117 deliveries) in the local PHC. There was a statistically significant association between living in the nearer wards (wards 1 to 6) and delivery in a health facility ( $\chi^2 = 4.36$ ,  $P = 0.037$ ).

### *The ENC Practices*

Ninety six (82.9%) neonates cried immediately after birth. Thirty five (30.1%) infants were dried within five minutes of birth, some households waiting up to 30 minutes. The home birth attendants in 95 (81.1%) used a new or a boiled blade to cut the umbilical cord, and 6 (5.7%) used an unsterile blade or a sickle to cut the cord. Twenty two (18.6%) applied oil to the umbilical cord stump, rest did not apply. Seventy one (60.7%) initiated breastfeeding immediately or within one hour of birth, 37 (31.6%) within one to eight hours, and 90 (7.7%) after eight hours. Ten (9%) mothers discarded colostrum prior to initiating breastfeeding, and 20 (18%) gave their infants pre-lacteal feeds before breastfeeding. The most common pre-lacteals were ghee (a butter preparation), honey, or sugar water. Twenty-eight (23.9%) reported difficulty with either initiating breastfeeding or with producing enough milk for the infant and 62 (53%) exclusively breastfed for up to six months. Additional feeding was cow milk (23), infant formula (24), and porridge (“Kheer”) (21).

### *Childhood illnesses*

There were 87 (74.4%) infants who had diarrhea or an acute respiratory infection within the first year of life; and there was a significant relationship between non-exclusive breastfeeding within the first six months and sickness ( $\chi^2 = 6.16$ ,  $P = 0.013$ ).

## **DISCUSSIONS**

In this study, we have looked at the birth practices in one village located in the

mountains in Nepal and compared them to the international recommendations. We have discovered modest improvements in many of the birth related practices and find this quite encouraging. The recent interventions which have been carried out in this district should be commended, applauded and replicated in other rural areas and communities. Specifically, those factors which showed improvement include using clean equipment for cord cutting, not placing other materials on the umbilical stump, and improved feeding of colostrum in the first hour after birth. Some factors that could benefit from further education included thermal care immediately post-partum, exclusive breast feeding in the first six months of life, and registering a newborn child.

As compared to previous data observing that only 33% of birth attendants in Makwanpur district used a new or boiled blade (68% nationally), we found that 81% used the proper equipment for cutting the cord.<sup>1,11</sup> The cause for this dramatic improvement is not readily apparent and requires further investigation. Application of oil and other substances to the umbilical cord stump has been identified as a common practice in Nepal, which makes the infant prone to infection.<sup>1,10,11</sup> In this community, less than a fifth of the households engaged in this practice (18.7%). However, we did not ask families that had delivered in a health facility whether they applied a substance to the cord upon returning home; this could have potentially revealed a much higher or lower prevalence of this practice.

Wrapping and drying of the baby should occur immediately after delivery in order to maintain the neonate’s temperature and prevent complications; and bathing should be delayed for 24 hours.<sup>12</sup> In this community, less than a third of the neonates were dried immediately or within five minutes of delivery (30.1%), and nearly a quarter of neonates (24.1%) were bathed within the first day of birth, and half of those occurred within the first hour. This indicates that the community members need further education on the significance of thermal control and its impact in neonatal morbidity and mortality.

Breastfeeding within the first hour after birth is essential to promote neonatal health.<sup>3</sup> In Daman VDC, a significant percentage (60.7%) breastfed their infant within the first hour and 92.3% within eight hours. We did not study the causes of the high rates of non-exclusive breastfeeding, but other studies demonstrate this is due to cultural beliefs, insufficient breast milk production, and maternal illness.<sup>13,14</sup> One potential cause may be difficulty in breast milk production as reported by nearly a quarter of the mothers. Another potential etiology may be given that Daman is a farming community, newly delivered mothers often returned to their field work as was observed, but this data was not exclusively collected.

The need of each village community will vary based on multiple factors ranging from the education of the mother to the presence of birth attendants in the district to the distance and quality of transport to higher level healthcare facilities. The specific strengths and areas of improvement of each community must therefore be closely considered prior to instituting an intervention.

Another interesting finding from our research is that 69.2% of births were not registered. The United Nation Children's Fund has highlighted the importance of promoting birth registration, particularly among impoverished and rural populations that often have much lower rates of registration.<sup>5</sup> Registration contributes to national data and helps in resource allocation to health and development programs for individual.

## CONCLUSIONS

The survey demonstrates an improvement in community education about proper neonatal and umbilical cord care in rural Nepal. Health education on exclusive breastfeeding, better thermal regulation of the infant, births registration need to be stressed.

## ACKNOWLEDGEMENTS

We are thankful to the Patan Academy of Health Sciences, Nepal, for technical and logistics support and support of health facility staff of Primary Health Care Center, Daman.

## FUNDING

Partially supported by Stanford University School of Medicine, California, USA and Patan Academy of Health Sciences, Kathmandu, Nepal.

## REFERENCES

1. Ministry of Health and Population (MOHP) [Nepal], New ERA, and ICF International Inc. 2012. Nepal Demographic and Health Survey 2011. Kathmandu, Nepal: Ministry of Health and Population, New ERA, and ICF International, Calverton, Maryland.
2. Allen CW, Jeffery H. Implementation and evaluation of a neonatal educational program in rural Nepal. *Journal of tropical pediatrics*. 2006;52(3):218-22.
3. Narayanan I, Rose M, Cordero D, Faillace S, Sanghvi T. The components of essential newborn care. Arlington, VA: Basics Support for Institutionalizing Child Survival Project (BASICS II) for the United States Agency for International Development; 2004.
4. World Health Organization. World health statistics 2010. Geneva: World Health Organization; 2010. 177 p. p. [updated 2010; cited 2012 Feb 26]. Available from: <http://data.un.org/>.
5. The United Nations Children's Fund. The 'Rights' Start to Life: A Statistical Analysis of Birth registration. New York: UNICEF; 2005.
6. Paudel NR. Health Policy Design and Implementation in Nepal: A Policy Discussion. NUFU Conference; 2008 Dec 14- Dec15. Kathmandu; 2008. Available from: [http://www.ncf.org.np/upload/files/490\\_en\\_health\\_policy\\_design\\_and\\_implementation\\_in\\_nepal\\_by\\_narendra\\_raj\\_poudel.pdf](http://www.ncf.org.np/upload/files/490_en_health_policy_design_and_implementation_in_nepal_by_narendra_raj_poudel.pdf).
7. Rai SK, Rai G, Hirai K, Abe A, Ohno Y. The health system in Nepal-An introduction. *Environmental health and preventive medicine*. 2001;6(1):1-8.
8. Khanal S, Zhang W, Khanal S. The Efficacy of Community Based Intervention in Newborn Care Practices and Neonatal Illness

- Management in the Morang District of Nepal. Life Science Journal. 2009;6(4).
9. World Health Organization. Maternal and Newborn Health / Safe Motherhood Unit. Essential newborn care: report of a technical working group (Trieste, 25-29 April 1994). Geneva: World Health Organization; 1996. 19 p. p.
  10. Manandhar SR, Ojha A, Manandhar DS, Shrestha B, Shrestha D, Saville N, et al. Causes of stillbirths and neonatal deaths in Dhanusha district, Nepal: a verbal autopsy study. Kathmandu Univ Med J. 2010;8(29):62-72.
  11. Osrin D, Tumbahangphe KM, Shrestha D, Mesko N, Shrestha BP, Manandhar MK, et al. Cross sectional, community based study of care of newborn infants in Nepal. BMJ. 2002;325(7372):1063.
  12. World Health Organization. Maternal Health and Safe Motherhood Programme. Thermal control of the newborn: a practical guide. Geneva: World Health Organization; 1993. 40 p. p.
  13. Olang B, Heidarzadeh A, Strandvik B, Yngve A. Reasons given by mothers for discontinuing breastfeeding in Iran. International breastfeeding journal. 2012;7(1):7.
  14. Semega-Janneh IJ, Bohler E, Holm H, Matheson I, Holmboe-Ottesen G. Promoting breastfeeding in rural Gambia: combining traditional and modern knowledge. Health policy and planning. 2001;16(2):199-205.