

## Original Research Article

# Determinants of knowledge and practices of postnatal mothers on essential newborn care in a selected area of rural Haryana

Mangi Lal Choudhary<sup>1</sup>, Poonam Joshi<sup>1\*</sup>, L. Levis Murry<sup>1</sup>, Sumit Malhotra<sup>2</sup>, M. Jeeva Sankar<sup>3</sup>

<sup>1</sup>College of Nursing, <sup>2</sup>Centre for Community Medicine, <sup>3</sup>Department of Pediatrics, Neonatology Division, All India Institute of Medical Sciences, New Delhi, India

**Received:** 31 August 2020

**Accepted:** 12 March 2021

### \*Correspondence:

Dr Poonam Joshi,

E-mail: [pjoshi495@gmail.com](mailto:pjoshi495@gmail.com)

**Copyright:** © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

## ABSTRACT

**Background:** Knowledge and practices of postnatal mothers is very crucial in providing care to newborns. Aim was to assess determinants of the knowledge and practices of postnatal mothers on essential newborn care.

**Methods:** A community based cross-sectional study was conducted among 150 postnatal mother - neonate dyads in one of the selected Primary Health Centres (PHC) of rural Haryana. A self-developed, pre-tested and validated structured interview schedule containing socio-demographic, clinical profile information and a knowledge and practice questionnaires ( $\alpha$ -0.79, 0.86) having 38 multiple choice questions (MCQs) and 28 items respectively were used for data collection covering various aspects of essential newborn care such as thermal care, breastfeeding, cord care, eye care, handwashing, and danger signs.

**Results:** More than half (52%) of the postnatal mothers had moderate knowledge and 76.7% of postnatal mothers reported of adequate practices. Gaps were identified in terms of knowledge and practices in the domains of thermal control, breastfeeding, cord care and eye care. Overall knowledge and practice scores of postnatal mothers were positively correlated ( $r = 0.71$ ,  $p < 0.001$ ). Significant association was observed between the overall practice scores and socio-demographic variables of postnatal mothers such as religion [AOR] (4.96 95%CI; 1.21-20.2), level of education (47.5 95%CI; 2.8-820.2), socio-economic status (16.9 95%CI; 0.9-288.4).

**Conclusions:** Some gaps were observed in the adopting safe practices in the domains of thermal control, breastfeeding, cord care and eye care among the postnatal mothers; necessitating need for education, reinforcement and dispelling the cultural beliefs.

**Keywords:** Essential newborn care, Knowledge, Postnatal mother, Practices

## INTRODUCTION

Over the last decade, India has shown considerable improvement in terms of decentralised health policy, decision making and cost-effective interventions in newborn care. Significant steps have been taken to reduce maternal and child mortality, but we still could not meet target 4 of the Millennium Development Goals (MDG 4) of a two-thirds reduction in under-five mortality rate between 1990 and 2015.<sup>1</sup> Now with Sustainable

Development Goals (SDGs), it is aimed to reduce neonatal mortality to below 12/1,000 live births by the year 2030.<sup>2</sup> Though many efforts have been made by the government of India to reduce neonatal mortality in India, it has continued to be great public health problem. Essential newborn care (ENBC) is a comprehensive strategy designed to improve the health of newborns, right from before conception to the postnatal period. ENBC practices, as recommended by World Health Organization (WHO), include drying and wrapping the newborn immediately after delivery, delayed bathing,

initiation of early and exclusive breastfeeding, handwashing before providing clean and dry cord care, and eye care, and identification of danger signs.<sup>3</sup> There is ample research evidence to suggest the influencing role of socio-cultural factors in newborn health in the country.<sup>4-7</sup> Insufficient knowledge of parents regarding newborn care could lead to parent's confusion, improper newborn care and may threaten neonatal health. Therefore, the present study was conceptualized to find out the determinants of ENBC among the postnatal mothers.

## METHODS

A community based cross-sectional study was conducted among 150 postnatal mothers and neonates dyads in the one of the selected Primary Health Centres (PHC) of the Intensive Field Practice Area (IFPA) of the Comprehensive Rural Health Services Project (CRHSP) covered a total population of 1, 00,772, located in the Ballabgarh block in Faridabad district of the Northern state of India and was established in 1961 to develop a model for rural health-care practice in India. The selected PHC catered health services to seventeen villages covering a population of 52,000 approximately with 98.2% institutional deliveries and 38.6 infant mortality rate per 1,000 live births.<sup>8</sup> Ethical approval was taken from the institute ethics committee (Ref. No. IECPG-148/28.02.2019). Birth register at every sub-centre was referred for making a list of postnatal mothers delivered during the study period. Postnatal mothers were contacted by making home visits along with ASHA (Accredited Social Health Activists) workers and enrolled using convenience sampling techniques. Written informed consent was taken after explaining the purpose of the study from the participants. Postnatal mothers having stable single/ twins/ term/ preterm/ post term/low birth weight newborns, residing in the villages of selected PHC, willing to participate in the study and able to understand Hindi or English were included. The postnatal mothers having critically ill newborns and hospitalized or not in a condition to provide information due to her own illness or hospitalization or mental illness were excluded. The study was conducted from 1st July to 30th November 2019.

The required sample size was determined by assuming the mean knowledge score among postnatal mothers in essential newborn care as 55.3% to 65.3% on home based newborn care.<sup>9</sup> Keeping 55% proportion and 20% precision confidence, the sample size was calculated using the formula:  $\text{Sample size} = 4PQ/R^2$ . The calculated sample size was 81 and it was rounded-off to 90 postnatal mothers. Due to availability of more postnatal mothers in the study area, a total of 150 postnatal mothers were recruited to improve the level of precision. So, the final sample size of 150 postnatal mothers were enrolled in the study.

The study tool consisted of knowledge and practice questionnaires along with socio-demographic and clinical

data sheets. The knowledge and practice questionnaires were a structured interview schedule, prepared after extensive review of literature. In socio-demographic and clinical profile information related to age, religion, type of family, educational status and occupation of postnatal mother and her husband, socio-economic status of family, place of delivery, mode of delivery, birth order, gestational age, sex of newborn, birth weight and age in days on the day of interview were included. Reliability of the tools was established by a test-retest method. The structured knowledge questionnaire had 38 multiple choice questions (MCQs) and True and False items covering various aspects of ENBC like thermal care, breastfeeding, cord care, eye care, hand washing and danger signs. The practice questionnaire had 28 items, used for assessing the practice of postnatal mothers related to ENBC. A score of '1' was given for correct response and '0' for incorrect response. The maximum possible knowledge and practice scores were 38 and 28 respectively. Knowledge and practice scores were categorized as adequate (>75%), moderate (51-75%) and inadequate ( $\leq 50\%$ ). The structured interview schedule was pre-tested and validated. Tools used for data collection included socio-demographic and clinical data sheets, knowledge questionnaire ( $\alpha=0.79$ ) and practice questionnaire ( $\alpha=0.86$ ).

The collected data were entered into the MS Excel 2013 spreadsheet, coded appropriately and analysed using statistical package STATA 14.0. Appropriate descriptive statistics like frequency, percentage, mean, standard deviations and range were used to describe demographic variables of the study participants. Karl Pearson's coefficient of correlation for assessing correlation between knowledge and practices and logistic regression analysis were used to assess the association between the study variables and the postnatal mother's knowledge and practices. The level of significance was considered as  $p$  value  $< 0.05$ .

## RESULTS

The mean age (SD) of the participants was  $24.6 \pm 3.8$  years. Majority of postnatal mothers (96.7%) belonged to Hindu religion, had joint families (83.3%) and were housewives (96.3%). More than half of the mothers (57.3%) had secondary level or above educational status and majority of mothers belonged to middle class or above as per the modified BG Prasad's scale-2019 (Table 1). The mean birth weight of newborns was  $2901 \pm 458.6$  gm. Most of the newborns were of second birth order (44%) with the mean gestational age (weeks) of  $38.6 \pm 1.7$ . The study included female and male newborns in almost equal proportion. Most of the newborns 109 (72.7%) weighed between 2500-3499 g. The mean age of newborns on the day of postnatal mothers' interview was  $19.2 \pm 7.7$  days (Table 2). The mean knowledge scores of postnatal mothers on ENBC was  $23.4 \pm 5.7$ . About half of postnatal mothers had moderate knowledge (Table 3).

**Table 1: Socio-demographic characteristics of postnatal mothers, n=150.**

Variables	Frequency (%)
<b>Age (years)*</b>	24.67±3.89
<b>Religion</b>	
Hindu	145 (96.7)
Muslim	5 (3.3)
<b>Type of family</b>	
Nuclear	25 (16.7)
Joint	25 (16.7)
<b>Educational status</b>	
Illiterate	16 (10.7)
Upper primary	33 (22)
Secondary	33 (22)
Senior secondary	36 (24)
Graduation & above	32 (21.3)
<b>Occupational status</b>	
Housewife	143 (96.3)
Working	7 (4.7)
<b>Socio-economic status**</b>	
Upper class	31 (20.7)
Upper middle class	35 (23.3)
Middle class	44 (29.3)
Lower middle class	30 (20)
Lower class	10 (6.7)

\*Mean±SD, \*\* modified BG Prasad’s scale-2019.

**Table 2: Birth profile of new-borns (n=150).**

Variables	Frequency (%)
<b>Place of birth</b>	
Institutional	145 (96.7)
Home	5 (3.3)
<b>Mode of delivery</b>	
Normal vaginal	120 (80)
Cesarean section/assisted	30 (20)
<b>Birth order</b>	
First	49 (32.7)
Second	66 (44)
Third	24 (16)
Fourth or more	11 (7.3)
Gestational age (week)*	38.63±1.79
<b>Weight (in gm)</b>	
<1999	3 (2)
2000-2499	18 (12)
2500-3499	109 (72.7)
>3500	20 (13.3)
<b>Age in days (on the day of interview)</b>	<b>19.24±7.77</b>
0-7	16 (10.7)
8-14	32 (21.3)
15-21	33 (22)
22-28	69 (46)

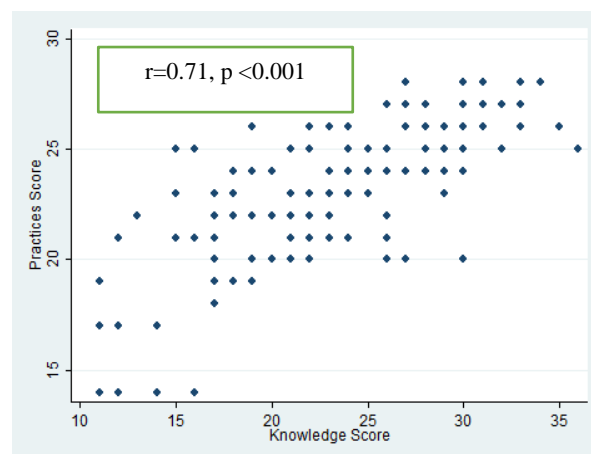
\*Mean±SD.

**Table 3: Overall knowledge scores of postnatal mothers on ENBC, n=150.**

Knowledge	Mean knowledge scores	Frequency (%)
Inadequate (≤ 50%)	23.42±5.73	42 (28)
Moderate (51-75%)		78 (52)
Adequate (>75%)		30 (20)

**Table 4: Overall practice scores of postnatal mothers on ENBC, n=150.**

Practices	Mean practice scores	Frequency (%)
<b>Inadequate (≤ 50%)</b>	23.41±3.04	4 (2.7)
<b>Moderate (51-75%)</b>		31 (20.7)
<b>Adequate (&gt;75 %)</b>		115 (76.7)



**Figure 1: Correlation between knowledge and practice of postnatal mothers on ENBC (n=150).**

The mean practice scores of postnatal mothers on ENBC was 23.4±3.0. More than two-thirds of postnatal mothers had adequate practices (Table 4). Overall knowledge and practice scores of postnatal mothers were positively correlated ( $r=0.71, p<0.001$ ) (Figure 1). Variable considered for regression analysis were postnatal mothers age, religion, type of family, educational status, socio-economic status, number of ANC visits and sex of newborn. The practice score was significantly high in postnatal mothers having adequate practice score compared to inadequate and moderate practice score who belongs to joint family (adjusted odds ratio [AOR]: 4.96 95%CI; 1.12-20.2) or education status graduation and above (AOR: 47.5 95%CI; 2.8-820.2) or belong to upper class (AOR: 16.9 95%CI; 0.9-288.4) (Table 5).

**Table 5: Association between practices on ENBC and important determinant of postnatal mothers and newborns (n=150).**

Variables	Unadjusted OR (95% CI)^	P value	Adjusted OR (95% CI)+	P value
<b>Age (years)</b>				
<20	Ref.		Ref.	
20-24	2.3 (0.38-13.7)	0.37	2.5 (0.15-40.1)	0.52
25-29	1.6 (0.27-10.4)	0.58	2.3 (0.12-42.8)	0.58
30-34	1 (0.12-7.9)	1.0	1.3 (0.04-44.2)	0.88
≥35	0.25 (0.02-2.7)	0.26	26.2(0.22-3161.3)	0.18
<b>Religion</b>				
Hindu	Ref.		Ref.	
Muslim	0.06 (0.01-0.6)	0.02	0.64 (0.01-2.8)	0.15
<b>Type of family</b>				
Nuclear	Ref.		Ref.	
Joint	6.30 (2.51-15.8)	<0.001	4.96 (1.21-20.2)	0.02
<b>Educational status</b>				
Illiterate	Ref.		Ref.	
Upper primary	11.5 (2.6-50.3)	0.001	33.8 (3.6-316.4)	0.002
Secondary	13.5 (3.1-59.9)	0.001	11.3 (1.2-103.9)	0.032
Senior secondary	47.7 (8.5-267.3)	<0.001	33.7 (2.6-433.8)	0.007
Graduation & above	65.0 (9.7-436.3)	<0.001	47.5 (2.8-820.2)	0.008
<b>Socio-economic status</b>				
Lower class	Ref.		Ref.	
Lower middle class	1.5 (0.3-6.4)	0.585	3.2 (0.3-27.8)	0.29
Middle class	7.9 (1.8-35.6)	0.007	9.2 (1.0-84.7)	0.05
Upper middle class	9.0 (1.8-43.7)	0.006	8.0 (0.8-83.8)	0.08
Upper class	21.7 (3.2-147.1)	0.002	16.9 (0.9-288.4)	0.05
<b>ANC visits</b>				
<4	Ref.		Ref.	
≥4	2.2 (0.7-6.5)	0.16	0.2 (0.3-1.9)	0.17
<b>Sex of newborn</b>				
Male	Ref.		Ref.	
Female	1.5 (0.7-3.3)	0.25	2.0 (0.6-6.3)	0.21

## DISCUSSION

Good knowledge among postnatal mothers about ENBC is vital for healthy newborns. In the present study more than half of postnatal mothers had moderate knowledge and three-fourths had adequate practices related to ENBC.

Thermo-regulation is an important aspect of ENBC. All mothers should be equipped with the knowledge of proper thermal protection of the newborn, so that hypothermia and its associated burden of morbidity and mortality can be minimized. In the present study, knowledge of postnatal mothers on thermal care was moderately poor. This finding is in line with the results of Mohini et al. in which poor knowledge of mothers was reported, however the study reported a good practice of delaying the first bath to the newborn.<sup>9</sup> Mothers are required to explain the importance of keeping the neonates warm. In the present study, the majority of

mothers had reported keeping their newborns close to their body for more than 12 hours/day with mean duration (hours) of  $15.7 \pm 3.6$ . This finding is in line with the results of Mani et al. which suggests that there is a gap between knowledge and practices related to maintenance of temperature in neonates.<sup>10</sup> Despite showing relatively moderately poor knowledge, mothers demonstrated good practice of skin to skin contact.

Breastfeeding is a basic human activity, vital to infant's health. The WHO recommends that neonates should have early initiation of breastfeeding within half an hour of birth followed by exclusively breastfeeding for the first six months. In India, breastfeeding appears to be influenced by socio-economic status, cultural, traditional and educational background of the mothers. In the present study the knowledge of postnatal mothers on breastfeeding was adequate. These finding is in line with previous study findings by Mohini et al, Vijayalakshmi et al, Prolactal feeding, despite being discouraged by

health care providers, is still very prevalent, and the most common reason for delay in breastfeeding.<sup>9,11</sup> In the present study less than half of postnatal mothers started breastfeeding within 1 hour of delivery and reportedly gave prelacteal feeds such as water, ghutti, honey and tea etc., before breastfeeding. This finding is congruent with many studies from India and other South Asian countries indicating that postnatal mothers supplement breastfeeding with other foods or liquid before beginning breastfeeding.<sup>12-15</sup> Neonatal sepsis is the third important cause of neonatal death in the first month of life. The newly cut umbilical cord can be a pathway of bacterial infection for neonatal sepsis and death. Harmful traditional cord care practices are more common in low and middle income countries.<sup>16</sup> In the present study most postnatal mothers applied powder, oil/ghee, medicated powder, turmeric powder on umbilical cord either as a part of traditional practice or for promoting early healing of the umbilical stump. Similar findings were reported by Saaka et al, Baqui et al. Handwashing is a very important tool in preventing many infections, which is primarily influenced by the risk perception of the postnatal mothers. In the present study, most postnatal mothers and caregivers were doing handwashing before handling the baby (76.7%) and after changing the baby's diaper (98%).<sup>17,18</sup> A significant number of mothers did not consider it necessary before handling the babies. Hence they require more information on maintaining hand hygiene prior to handling the baby. This finding is in line with the results of Sinha et al.<sup>19</sup>

The postnatal mothers perceived their baby to be ill if symptoms included hot touch (94.7%), decreased breastfeeding (68.7%), diarrhea and vomiting (58%), fast breathing and difficulty in breathing (54%). Baby cold to touch (36.7%), jaundice (24.7%) and discharge from the eye/belly button (15.3%) were least likely symptoms to be perceived as a danger sign. Nearly 41 (27.3%) postnatal mothers reported a newborn illness during the neonatal period, similar to that documented by Sharma et al.<sup>12</sup> Majority of caregiver's resorted to seeking help from health facilities in hot to touch/cold, decreased breastfeeding, difficulty/fast breathing, discharge from cord/eyes and diarrhoea/vomiting. Around 24 (16%) sought the services from traditional healer and a few of them followed home remedies in neonatal jaundice. In the present study religion and educational status of postnatal mothers significantly influenced the practices of the postnatal mothers related to ENBC. Therefore, there is a need to dispel the hard core cultural beliefs of the postnatal mothers by education and reinforcement.

In the present study, most of the ENBC activities were directly observed by the researcher and proper advice was given to postnatal mothers and caregivers after the home visit. However, the study has a number of limitations. Single centre, and small sample size of postnatal mother's limits the generalizability of study findings. Possibility of having observation bias cannot be ignored. Similar study

can be conducted on a large scale in multi-centric facilities using large sample size.

## CONCLUSION

Most of the postnatal mothers had moderate knowledge and adequate practices related to ENBC. Some gaps were observed in the adopting safe practices in the domains of thermal control, breastfeeding, cord care and eye care; necessitating need for education and reinforcement and dispelling the cultural beliefs.

## ACKNOWLEDGEMENTS

Researcher would like to acknowledge postnatal mothers with their newborns and ASHA workers, without whom this study would not have been possible.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee.*

## REFERENCES

1. Liu L, Chu Y, Oza S, Hogan D, Perin J, Bassani DG, et al. National, regional, and state-level all-cause and cause-specific under-5 mortality in India in 2000–15: a systematic analysis with implications for the Sustainable Development Goals. *Lancet Glob Health*. 2019;7(6):e721-34.
2. Kumar S, Kumar N, Vivekadhish S. Millennium Development Goals (MDGs) to Sustainable Development Goals (SDGs): Addressing Unfinished Agenda and Strengthening Sustainable Development and Partnership. *Indian J Community Med*. 2016;41(1):1-4.
3. World Health Organization, Department of Maternal N Child and Adolescent Health. WHO recommendations on postnatal care of the mother and newborn 2013 Available from: <http://www.ncbi.nlm.nih.gov/books/NBK190086/>.
4. Upadhyay RP, Singh B, Rai SK, Anand K. Role of Cultural Beliefs in Influencing Selected Newborn Care Practices in Rural Haryana. *J Tropical Pediatr*. 2012;58(5):406-8.
5. Willis JR, Kumar V, Mohanty S, Singh P, Singh V, Baqui AH, et al. Gender Differences in Perception and Care-seeking for Illness of Newborns in Rural Uttar Pradesh, India. *J Health Popul Nutr*. 2009;27(1):62-71.
6. Baqui AH, Williams EK, Darmstadt GL, Kumar V, Kiran TU, Panwar D, et al. Newborn care in rural Uttar Pradesh. *Indian J Pediatr*. 2007;74(3):241-7.
7. Kamath SP, Garg D, Khan MK, Jain A, Baliga BS. Perceptions and Practices regarding Breastfeeding among Postnatal Women at a District Tertiary Referral Government Hospital in Southern India [Internet]. *Scientifica*. 2016. Available from:

- <https://www.hindawi.com/journals/scientifica/2016/5430164/>.
8. Annual report 19-e-20-1-20.pdf. Available from: [https://aiims.edu/images/pdf/annual\\_reports/annual%20report19-e-20-1-20.pdf](https://aiims.edu/images/pdf/annual_reports/annual%20report19-e-20-1-20.pdf).
  9. Mohini H, Shetty S. A study to assess the knowledge of mothers on home based neonatal care at selected area of rural Bangalore. *International J Community Medicine and Public Health*. 2017;4(5):1695-700.
  10. Mani C, Lal PK, Kumar L. Cross sectional study on newborn care practices in a rural area. *International Journal of Community Medicine and Public Health*. 2019;6(3):1000.
  11. Vijayalakshmi S, Patil R, Datta SS. Community-based study on newborn care practices and its determinants in rural Pondicherry, India. *J Neonatal Biol*. 2014;3(5):1-5.
  12. Sharma H, Goel AD, Gosain M, Amarchand R, Kapoor SK, Kumar A, et al. Community healthcare professional visits are important determinants of knowledge and practices regarding newborn care among mothers. *Journal of Natural Science, Biol Medic*. 2018;9(2):159.
  13. 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.
  14. Fikree FF, Ali TS, Durocher JM, Rahbar MH. Newborn care practices in low socioeconomic settlements of Karachi, Pakistan. *Soc Sci Med*. 2005;60(5):911-21.
  15. Holman DJ, Grimes MA. Colostrum feeding behaviour and initiation of breast-feeding in rural Bangladesh. *J Biosoc Sci*. 2001;33(1):139-54.
  16. Coffey PS, Brown SC. Umbilical cord-care practices in low- and middle-income countries: a systematic review. *BMC Pregnancy Childbirth*. 2017;17(1):68.
  17. Saaka M, Iddrisu M. Patterns and Determinants of Essential Newborn Care Practices in Rural Areas of Northern Ghana. *International J Population Res*. 2014;2014:1-10.
  18. Baqui AH, Williams EK, Darmstadt GL, Kumar V, Kiran TU, Panwar D, et al. Newborn care in rural Uttar Pradesh. *Indian J Pediatr*. 2007;74(3):241-7.
  19. Sinha LN, Kaur P, Gupta R, Dalpath S, Goyal V, Murhekar M. Newborn care practices and home-based postnatal newborn care programme – Mewat, Haryana, India, 2013. *Western Pac Surveill Response J*. 2014;5(3):22-9.

**Cite this article as:** Choudhary ML, Joshi P, Murry LL, Malhotra S, Sankar MJ. Determinants of knowledge and practices of postnatal mothers on essential newborn care in a selected area of rural Haryana. *Int J Community Med Public Health* 2021;8:1674-79.