

Article

Knowledge and practice of essential newborn care among rural mothers

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Abstract: Components of essential newborn care (ENC) and neonatal resuscitation are proven interventions for reducing neonatal mortality rate and stillbirth rates. This cross-sectional study was carried out among 354 rural mothers to assess the level of knowledge and practice of ENC. The study was conducted from 1st January to 31st December 2019 in Panchagarh district. Rural mothers were interviewed with a semi-structured pre-tested questionnaire and an observational check list was also used. This study revealed that, majority of the respondents 306 (86.4%) knew that baby should be kept warmth by wrapping with dry cloth and 39(11.0%) respondents should be kept in skin to skin contact immediately after delivery to maintain thermoregulation. From the total respondents 202 (57.1 %) knew that once should start breast feeding immediately after birth. Out of 354 respondents 344 (97.2%) gave colostrum to their baby. The study also finds that, 210 (59.3%) respondents had inadequate knowledge regarding essential new born care while 144 (40.7%) had adequate knowledge and 164 (46.3%) respondents had inadequate practice regarding essential new born care while 190 (53.7%) had adequate practice. Respondents who had inadequate knowledge had significantly more inadequate practice than others ($p<0.001$). Effective interventions can improve key newborn care practices, care-seeking and, in high mortality settings, reduce newborn mortality.

Keywords: essential newborn care; initiation of breathing; resuscitation; management of new-born illness; danger signs regarding ENC; optimal thermal care; kangaroo care

1. Introduction

The birth of the baby represents a sudden transition from the intrauterine life to the external environment. The time immediately after the birth of the baby, is critical for newborn. Care practices immediately after delivery play a major role in causing neonatal morbidities and mortalities (Srinivasa *et al.*, 2018).

Essential newborn care (ENC), defined as care provided soon after birth, is critical in improving neonatal survival (World Health Organization (WHO), 2014). ENC practices at or immediately after birth include newborns receiving hygienic cord care during delivery to prevent infection, adequate thermal protection after delivery via delayed bathing, immediate drying and wrapping and skin-to-skin contact to prevent hypothermia and immediate breastfeeding because of the many benefits including colostrum.

Breast feeding is the best natural feeding and breast milk is the best milk. The basic food of infant is mother's milk. Breast feeding is the most effective way to provide a baby with a caring environment and complete food. It meets the nutritional as well as emotional and psychological needs of the infant (Parul, 2007). Breast milk provides optimal nutrition and promotes the child's growth and development (WHO, 2006).

Hypothermia is considered as the silent killer of neonates. It increases the neonatal morbidity and mortality. Maintenance of warmth of the neonates enhances their survival. Thermal protection of the newborn babies is considered as one of the most important essentials in neonatal care. To prevent neonatal hypothermia, immediate actions should be carried out (Parul, 2007).

The umbilical cord is cut about 2-3 inches from the naval with aseptic precautions during delivery and tied with sterile cotton thread or disposable plastic clip. The cord must be inspected. No dressing should be applied and the cord should be kept open and dry. Normally, it falls off after 5 to 10 days (Parul, 2007). Local practices of putting various substances on the cord stump - whether in health facilities or at homes - should be carefully examined and discouraged if found harmful and substituted with acceptable ones (WHO, 2006).

A newborn can die within minutes if prompt recognition, diagnosis and treatment are not initiated for newborn illnesses. Household and health facility related delays were the major contributors to late presentation, treatment initiation and subsequent newborn deaths in many developing countries. These delays especially at the household level are particularly important because once there is a delay in the recognition of the danger signs of newborn illnesses there are automatically delays at all other levels i.e. initiation of appropriate treatment and/or referral to a better resourced hospital etc. Therefore, it becomes necessary to survey the knowledge of the signs which mothers in the developing country may perceive as danger signs (signs leading either to recognition of illness or health care seeking) in the sick newborns (Ekwochi *et al.*, 2015).

Mothers were the principal provider for skin and cord care during the neonatal period. Traditionally, mothers are the caregiver for children irrespective of education, income and social class differences. It is evidenced by several studies that mothers have average to poor knowledge on newborn care (Senarath *et al.*, 2007). This poor awareness among mothers can lead to unsuccessful results in terms of care giving. A number of research studies show that home visits by providers trained to deliver simple, effective interventions can improve key newborn care practices, care-seeking and, in high mortality settings, reduce newborn mortality (Gogia and Sachdev, 2010; Bhutta *et al.*, 2011).

The National Neonatal Health Strategy and Guidelines for Bangladesh recommend a set of essential newborn care practices. Essential newborn care focuses on the use of clean instruments to cut the umbilical cord, applying nothing to the cord, immediate drying (within five minutes) keeping the baby warm, delaying bathing to 72 hours after birth, and initiating breastfeeding within 1 hour of delivery. Bangladesh Demographic and Health Survey 2014 suggests that, overall, only 6 percent of newborns receive all the essential newborn care practices (NIPORT, 2016).

Coverage of skilled attendance at birth is 36 percent in rural areas of Bangladesh. Deliver at home in the presence of traditional birth attendants resulted in many harmful traditional practices applied to the newborn baby by mothers and grandmothers. Babies receive little attention until the placenta is expelled. They may or may not be covered in cloth or dried. No skin to skin contact is reported and newborns have often been placed slightly away from the mother's side. Attendants are largely focused on the delivery of the placenta and the related well-being of the mother (Degefie *et al.*, 2014). Insufficient knowledge of parents during this period could lead to parents' confusion and decreased quality of care (Kabwijamu *et al.*, 2016) that in turn threaten the neonatal health and could even leads to neonatal mortality (Kumar *et al.*, 2008).

Providing optimal care will greatly improve the survival of infants (Parul, 2007). Majority of the neonatal deaths could be prevented through simple and cost-effective essential newborn care interventions both in the community and health facilities. The essential newborn care is focused on prevention of infection, thermal protection, resuscitation of newborn with asphyxia, early and exclusive breastfeeding, care for the low-birth weight babies, and identification and appropriate referral of sick neonates (Islam, 2000). However, assessing maternal knowledge and practice towards ENC has valuable importance in the healthy development of the newborn. Therefore, this study was performed to assess the level of knowledge and practice of essential newborn care among rural mothers

2. Materials and Methods

2.1. Ethical consideration

All the information collected for the study was utilized only for the purpose of thesis and was not disclosed to anyone. At the beginning, approval was obtained from the ethical committee of NIPSOM, under the Bangabandhu Sheikh Mujib Medical University, Dhaka, Bangladesh. Then informed written consent was obtained from participants after informing about the purpose of the study. A complete assurance was given that all information would be kept confidentially. Their participation and contribution was acknowledge with due respects. The right was given to the participants not to participate and to discontinue participation at any time in

study with consideration/without penalty. Informed consent was documented properly. Each respondent was interviewed separately and their privacy and confidentiality was maintained strictly.

2.2. Study design

A cross sectional study was carried out.

2.3. Study population

Mothers of new born of the two upazillas of Panchagarh district were the study population.

2.4. Study period

The study was conducted one year from 1st January to 31st December 2019.

- a) **Place of study:** The study was conducted in Atwari and Boda Upazila at Panchagarh district. Data were collected from several villages of Atwari and Boda Upazila.
- b) **Sampling technique:** Convenience sampling was adopted. Sample size 354.
- c) **Inclusion criteria:** Mothers within 42 days after their live birth and others willing to participate in the study
- d) **Exclusion criteria:** Mothers having infants who were critically ill and mothers having infants who were not present at the time of data collection
- e) **Tool of the study:** A semi-structured interviewer-administered questionnaire was used to collect data. The questionnaire was pretested in village of Tongi in Gazipur district. Necessary modifications were done and the questionnaire was finalized before collection of data. An observational check list was also used. Here, baby's appearance, skin, naval area, sign of BCG vaccination and eye were observed. There were total 11 knowledge related questions which had 26 correct answers. The values were coded as 0 = incorrect response and 1 = correct response. Respondents who responded correctly to $\geq 50\%$ of questions were categorized as having good knowledge and $<50\%$ of questions were categorized as having poor knowledge. There were total 6 practice related questions which had 8 correct answers. The values were coded as 0 = incorrect response and 1 = correct response. Respondents who responded correctly to $\geq 50\%$ of questions were categorized as having good practice and $<50\%$ of questions were categorized as having poor practice. Data was collected by face to face interview in Bangla. Each respondent was interviewed separately and their privacy and confidentiality was maintained strictly. The right was being given to the participants not to participate and to discontinue participation at any time in study with consideration/without penalty. Their participation and contribution was acknowledge with due respects. The statistical analysis was conducted using SPSS (Statistical Package for Social Science) version 25 statistical software.

3. Results and Discussion

This cross sectional study was carried out among 354 rural mothers to assess the level of knowledge and practice of Essential Newborn Care (ENC). They were interviewed with a semi-structured pre-tested questionnaire.

Table 1. Demographic characteristics of the respondents (n=354).

Age (years)	Frequency	Percent
Up to 19	85	24.0
20-24	189	53.4
25-30	80	22.6
Mean±SD= 22.14 ±3.27		
Educational status of the respondents		
Illiterate	117	33.1
Up to primary	67	18.9
Up to SSC	92	26.0
Up to HSC	41	11.6
Above HSC	37	10.5
Educational status of the husbands		
Illiterate	58	16.4
Up to primary	68	19.2
Up to SSC	86	24.3
Up to HSC	70	19.8
Above HSC	72	20.3

occupational status		
House wives	295	83.3
Service holders.	56	15.8
Occupational status of the husbands		
Service holder	111	31.4
Businessman	110	31.1
Farmer	93	26.3
Day labourer	40	11.3
No. of family member		
3-4	95	26.8
5-6	135	38.1
≥7	124	35.1
Family type		
Nuclear family	172	48.6
Joint family	182	51.4
Monthly family income (in taka)		
Up to 10000	92	16.1
11000 to 20000	196	42.4
> 20000	66	25.7
Mean ±SD =15906.78±7780.98 BDT		
Sex of the child		
Female	211	59.6
Male	143	40.4
Age (in days)		
1-7	49	13.8
8-14	56	15.8
15-21	51	14.4
22-28	71	20.1
>28	127	35.9
Mean±SD= 22.59 ±11.73 days		
Number of children		
One	70	19.8
Two	122	34.5
Three	104	29.4
Four	31	8.8
Five	27	7.6
Total	354	100.0

Table 1 shows that 189 (53.4%) of the respondents were from 20-24 years age group others were 85 (24.0%) from up to 19 years and 80 (22.6%) up to 25 to 30 years age group. The mean age of participants was 22.14±3.27 years which range from 17-30 years. Among the respondents 117 (33.1%) were illiterate and 67 (18.9%) had educational status up to primary, 92 (26.0%) respondents had educational status up to SSC whereas 41 (11.6%) of the respondents had educational status up to HSC and their husbands educational status were 58 (16.4%) illiterate, 68 (19.2%) had educational status up to primary, 86 (24.3%) up to SSC, 70 (19.8%) up to HSC and 72 (20.3%) husbands had educational status above HSC. Among the respondents, 295 (83.3%) were house wives and 56 (15.8%) were service holders and from their husbands occupation were 111 (31.4%) service holders, 110 (31.1%) businessman, 93 (26.3%) farmer and 40 (11.3%) were day labor. From the respondents 95 (26.8%) had 3-4 family member, 135 (38.1%) had 5-6 member, 124 (35.1%) had ≥7 family member and 172 (48.6%) respondents from nuclear family and 182 (51.4%) were from joint family. Among the respondents, 92 (16.1%) had monthly family income up to 10000 taka while others 196 (42.4%) had monthly family income from 11000 to 20000 taka and 66 (25.7%) had monthly family income >20000 taka. The average income was 15906.78±7780.98 taka. From the respondents 211 (59.6%) had female child and rests were male child 143 (40.4%) and their children age were 49 (13.8%) from 1-7 days age group whereas 56 (15.8%) were from 8-14 days age group, 127 (35.9%) were from > 28 days age group. Here, 70 (19.8%) respondents had one child, 122 (34.5%) had two children 104 (29.4%) had three children, 31 (8.8%) had four children and 27 (7.6%) respondent's had five children.

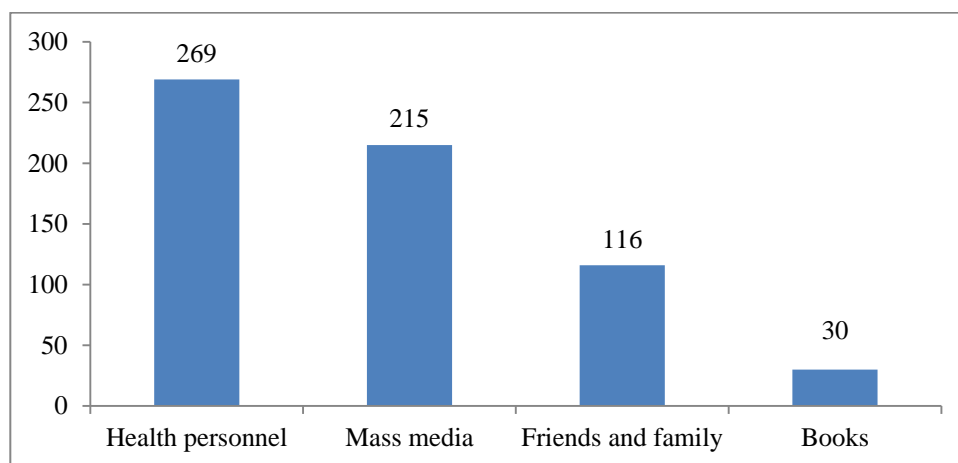


Figure 1. Distribution of the respondents by source of knowledge regarding essential new born care (n=354).

Figure 1 shows that, 269 (76.0%) respondents heard about essential new born care from health personnel and 215 (60.7%) from mass media. Others 116 (32.8%) heard from friends and family members and 30 (8.5%) respondent’s source of knowledge is books.

Table 2. Distribution of the respondents by knowledge regarding maintaining thermoregulation, first birth, naval care, breast feeding and vaccination (n=354).

Knowledge regarding maintaining thermoregulation	Frequency	Percent
Keep baby warmth by wrapping dry cloth	306	86.4
Baby should be nursed in same room with mother	148	41.8
Keep baby skin to skin contact immediately after delivery	39	11.0
Knowledge regarding first birth		
After 24 hours of birth	57	16.1
Within 24 hours of birth	297	83.9
Knowledge regarding naval care		
The umbilical stump of baby should not be covered by a cloth/bandage	90	24.3
Umbilical stump should not be soiled	264	75.7
Knowledge regarding breast feeding		
One should start breast feeding immediately after birth	202	57.1
The interval of feeding the baby is every 2/3 hours per day	21	5.9
The duration of exclusive breast feeding is six months	314	88.7
Knowledge regarding vaccination		
One should start vaccination just after birth	221	62.4
The child should be vaccinated to prevent disease	333	94.1

Table 2 shows that, 306 (86.4%) respondents knew that baby should be kept warmth by wrapping with dry cloth. Others 148(41.8%) knew that baby should be nursed in same room with mother and baby and 39(11.0%) respondents should be kept in skin to skin contact immediately after delivery to maintain thermoregulation. Here, out of 354 respondents, 297 (83.9%) respondents did not know that baby should be given first birth after 24 hours while 57 (16.1%) knew that baby should be given first birth after 24 hours. From the respondents, 93 (26.3%) knew that the umbilical stump of baby not be covered a cloth/bandage and 270 (76.3%) respondents knew that the umbilical stump should not be soiled. From the respondents, 202 (57.1 %) knew that once should start breast feeding immediately after birth, 21 (5.9%) respondents knew that the interval of feeding of the baby is every 2/3 hours per day and 314 (88.7%) respondents knew that the duration of exclusive breast feeding is six months. Among the respondents, 221 (62.4 %) knew that once should start vaccination just after birth and 333 (94.1%) respondents knew that the child should be vaccinated to prevent disease.

Table 3. Distribution of the respondents by knowledge regarding signs of eye infection, eye care and danger sign (n=354).

Knowledge regarding signs of eye infection	Frequency	Percent
Reddening of eye	223	63.0
Eye discharge	177	50.0
Swollen eye	187	52.8
Knowledge regarding eye care		
Should not use any substance like Kajol to eyes	146	41.2
Should use eye ointment immediately after birth to prevent eye infection	110	31.1
Should use any substance like Kajol to eyes	208	58.7
Knowledge regarding danger sign		
Vomiting / Diarrhoea	325	91.8
Yellowish discoloration of eyes, palms, and sole	274	77.4
Abdominal distension	229	64.7
Difficulty of breathing	143	40.4
Unable to breast feed	93	26.3
High grade fever (>37.50 C)	86	24.3
Abnormal jerking movement of limbs and eyes	42	11.9
Crying excessively	33	9.3
Lethargic baby	25	7.1
A baby cold to touch (<35.50 C)	15	4.2

Table 3 shows that, 223(63.0 %) respondents knew that reddening of eye are a sign of eye infection. Others 177 (50.0%) knew that eye discharge and 187 (52.8%) knew that swollen eye are signs of eye infection. Among the respondents, 146 (41.2 %) knew that one should not use any substance like Kajol to eyes and 110 (31.1%) respondents also knew that one should use eye ointment immediately after birth. Out of 354 respondents, 325 (91.7%) knew that vomiting / diarrhea is a danger sign for child. Majority of the respondents 274 (77.4%) knew that yellowish coloration of eyes, palms and sole is a danger sign for child and 229(64.7%) knew that abdominal distention are danger signs for child.

Table 4. Distribution of the respondents by practice of cleaning the umbilical cord when soiled, Maintaining thermoregulation, giving first bath, practice of feeding, nutritional status by weight and height chart (n=354).

Clean the umbilical cord when soiled	Frequency	Percent
Wash with clean water and soap and dry thoroughly	269	76.0
Others	85	24.0
Maintaining thermoregulation		
Keep baby warmth by wrapping dry cloth	269	76.0
Baby nursed in same room with mother	240	67.8
Keep baby skin to skin contact (Kangaroo care) immediately after delivery	68	19.2
Giving first bath		
After 24 hours	98	27.7
Within 24 hours	256	72.3
Feeding practice		
Colostrum given	344	97.2
Start breast feeding immediately after birth	108	30.5
Do not give anything to your child other than breast milk	231	65.3
Nutritional status by weight chart		
Normal	214	60.5
Mild malnourished	85	24.0
Moderate malnourished	41	11.6
Severe malnourished	14	4.0
Nutritional status by height chart		
Normal	182	51.4

Mild stunted	68	19.2
Moderate stunted	61	17.2
Severe stunted	37	10.5
Over height	6	1.7
Total	354	100.0

Table 4 shows that, 269 (76.0%) washed the cord with clean water and soap and dry thoroughly and 85 (24.0%) did not wash the cord with clean water and soap and dry thoroughly when soiled. Among the respondents, 269 (76.0%) kept their baby warmth by wrapping with dry cloth. Others 240(67.8%) nursed the baby in same room with them and kept baby in skin to skin contact immediately after delivery and 68(19.2%) respondents to maintain thermoregulation. Here, 98 (27.7%) respondents gave first bath to baby after 24 hours while 256 (72.3%) gave first bath to baby within 24 hours. Out of 354 respondents, 344 (97.2%) gave colostrum to their baby, 108 (30.5%) respondents start breast feeding immediately after birth and 231 (65.3%) respondents did not give anything to their child other than breast milk. Here, 214 (60.5%) respondent`s babies had normal nutritional status according to weight chart while 85 (24.0%) babies were mildly malnourished and 41 (11.6%) babies were moderately malnourished. Whereas 182 (51.4%) respondent`s babies had normal nutritional status according to height chart while 68 (19.2%) babies were mildly stunted, 61 (17.2%) babies were moderately stunted and 37 (10.5%) babies were severely stunted.

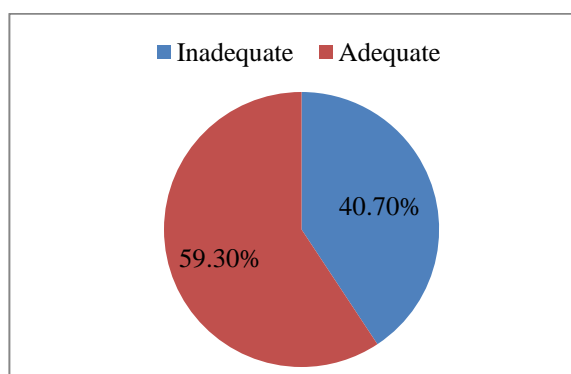


Figure 2. Distribution of respondents by level of knowledge regarding essential new born care (n=354).

Figure 2 shows that 210 (59.3%) respondents had inadequate knowledge regarding essential new born care while 144 (40.7%) had adequate knowledge.

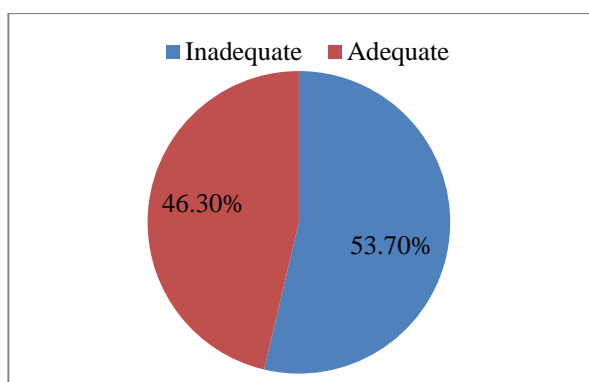


Figure 3. Distribution of respondents by level of practice regarding essential new born care (n=354).

Figure 3 shows that 164 (46.3%) respondents had inadequate practice regarding essential new born care while 190 (53.7%) had adequate practice.

Table 5. Association of level of knowledge and practice (n=354).

Level of knowledge	Level of practice		Total	Statistics
	Inadequate (%)	Adequate (%)		
Inadequate	126 (60.0)	84 (40.0)	210 (100.0)	$\chi^2=38.811$ df=1 p<0.001
Adequate	38 (26.4)	106 (73.6)	144 (100.0)	

Table 5 shows that level of practice was associated with level of knowledge. Respondents who had inadequate knowledge had significantly more inadequate practice than others ($p<0.001$).

4. Discussion

The National Neonatal Health Strategy and Guidelines for Bangladesh recommend a set of essential newborn care practices. Essential newborn care focuses on the use of clean instruments to cut the umbilical cord, applying nothing to the cord, immediate drying (within five minutes) keeping the baby warm, delaying bathing to 72 hours after birth, and initiating breastfeeding within 1 hour of delivery (NIPORT, 2014). Majority of the rural mothers had heard about essential new born care from health personnel (76.0%) and mass media (60.7%). Maintaining a neutral thermal environment is one of the key physiologic challenges that a newborn must face after delivery. Thermal care is central to reducing morbidity and mortality in newborns (Newborn Thermoregulation: A Self-Learning Package, 2013). Out of the 354 postnatal mothers, 86.4% knew that baby should be kept warmth by wrapping with dry cloth. Other studies also reported that most of the mothers knew this fact (Meseka *et al.*, 2017; Berhea *et al.*, 2018). Mothers of the present study had lacking in knowledge regarding the fact that the baby should be nursed in same room with mother as 41.8% mothers knew it while 84.5% Ethiopian mothers knew this (Berhea *et al.*, 2018). Only 11.0% mothers knew that baby should be kept in skin to skin contact immediately after delivery to maintain thermoregulation. Others studies also reported unsatisfactory results regarding this issue. Study conducted in Bangladesh reported that only 8.1 percent knew about Kangaroo method for thermoregulation (Alam *et al.*, 2008). Studies conducted in Africa reported that 33.3% to 50.8% mothers had knowledge regarding this issue.

Newborn cord care practices may directly contribute to infections, which account for a large proportion of the 4 million annual global neonatal deaths (Alam *et al.*, 2008). One fourth of the study participants (26.3%) knew that the umbilical stump of baby not be covered a cloth/bandage. Study of Meseka *et al.* (2017) also reported low knowledge in this issue. Majority of the (76.3%) respondents knew that the umbilical stump should not be soiled which was consistent with other study (Berhea *et al.*, 2018).

In this study majority of the mothers had knowledge regarding exclusive breastfeeding and when to start immunization. This result is comparable with other study (Berhea *et al.*, 2018).

Majority of the mothers had knowledge regarding signs of eye infection which matched other study. But mothers had knowledge gap regarding eye care as 41.2 % knew that one should not use any substance like Kajol to eyes and 31.1% had knowledge on using eye ointment immediately after birth. Study conducted in India also found low level of knowledge regarding eye care as 22.0% knew that one should not use Kajol to eyes (Srinivasa *et al.*, 2018).

Most of the mothers (91.7%) knew that vomiting / diarrhea is a danger sign for child. Other mentionable danger signs were yellowish discoloration of eyes, palms, and sole, abdominal distention, difficulty in breathing, inability in feeding and fever. Consistent results were observed in other studies where mothers also mentioned vomiting / diarrhea, difficulty in breathing, inability in feeding and fever (Ekwochi *et al.*, 2015; Berhea *et al.*, 2018).

The practice of cord care of the rural mothers were quite satisfactory as majority of the mothers (76.0%) washed the cord with clean water and soap, dry thoroughly when soiled. Out of the 354 post natal rural mothers, majority (59.3%) had inadequate knowledge regarding essential new born care. In India, majority of the mothers found to have average knowledge regarding this issue (Mohini and Shetty, 2017). In Pakistan, the knowledge of postnatal mothers on ENC was found poor (Gul *et al.*, 2014). In Sri Lanka, majority of the mothers lack adequate knowledge (Priyadarshanie and Pethiyagoda, 2015). In Ethiopia, majority of the mothers also had inadequate knowledge regarding essential new born care (Berhea *et al.*, 2018; Berhan and Gulema, 2018).

Majority of the mothers had adequate practice though majority had inadequate knowledge regarding essential new born care. There is a link between knowledge and practice. It is essential to have adequate knowledge to do adequate practice. But sometime people may have adequate practice without having adequate knowledge. This

practice may develop by seeing other people or family member to do that (Ramachadran and Dharmalingam, 1976).

The present study revealed that mothers who had adequate knowledge about essential newborn care had adequate practice on essential newborn care which was consistent with the study of Mersha *et al.* (2018).

5. Conclusions and Recommendations

Majority of the mothers had inadequate knowledge regarding essential new born care while less than half had adequate knowledge and had inadequate practice regarding essential new born care while more than half had adequate practice

Considering the average level of knowledge and practice regarding essential new born care, the following recommendations are put forward:

- Special emphasis should be given to improve thermal care by Kangaroo care for the newborn and to encourage immediate and exclusive breastfeeding.
- Post Natal Care service should be strengthened.
- Health education and behavioral change communications on essential newborn care are recommended. Health workers should give special emphasis on naval care and early breast feeding.
- Mass media coverage is needed regarding essential new born care to improve maternal knowledge and practice.
- To improve the quality and access to maternal health services, home visit using the rural health extension workers should be encouraged.

Conflict of interest

None to declare.

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