

Original Research



Who needs more support from health care workers to take care of the newborn in Sri Lanka?

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Abstract

Background: Sri Lanka reports the lowest neonatal mortality in South East Asia region, but it has been stagnant for the last decade. Moreover, neonatal morbidity is on the rise. New strategies to further reduce neonatal mortality and improve morbidity statistics should focus on more disadvantaged mothers and areas of low knowledge on newborn care, as these endanger the survival and quality of life of the newborn. Identifying who needs more care on which areas is fundamental in bridging this gap.

Objective: To assess the knowledge and associated factors on evidence-based interventions on newborn care among postpartum mothers

Methods: This cross-sectional study was conducted among 422 postpartum mothers with newborn babies in postnatal wards at a tertiary maternity care institution. The participants were interviewed consecutively using a pre-tested questionnaire, which was checked for judgmental validity. Knowledge was assessed on interventions identified by the World Health Organization and UNICEF to improve the survival and quality of life of newborn at the community level. Areas of low knowledge were assessed by the percentage of knowledge scores. Participants were dichotomized into 'good' and 'poor' levels of knowledge by the median knowledge score. Associations with low level of knowledge were evaluated using univariate as well as multivariate analysis, for which p value of 0.05 was considered as the level of significance.

Results: Mean age of the mothers was 29.7 (SD=5.6) years. The mean overall knowledge score was 72.7%. Knowledge was poor on interventions related to demand feeding and basic emergency care. Good level of knowledge was associated with having more than one child ($p<0.001$), secondary education ($p<0.001$) and attending antenatal parent-educational classes ($p=0.002$).

Conclusions: Most mothers possessed good overall knowledge, but knowledge was poor in a few important areas. Mothers of newborn who are primiparous, less educated and do not participate in antenatal parent-educational classes were at higher risk, implying that these mothers need more support from the health staff to avert preventable neonatal morbidities.

Keywords: newborn care, maternal knowledge, postpartum mothers, community care, South Asia

Introduction

Newborns undergo dramatic changes following birth, in order to adapt to a new external environment. As a result, the newborn is highly vulnerable for its survival during the period of first month, and mostly during the first 24 hours (1). Despite the emphasis given on many international strategies to avert preventable neonatal mortality including sustainable development goals, 2.9 million newborns die every year, accounting for 44% of the under-five global child mortality (2). Sri Lanka is performing substantially better than its neighbours with regard to newborn health, the current neonatal mortality rate of Sri Lanka being 6.5 per 1000 live births and the lowest for South East Asian Region (3). However, reduction of the neonatal mortality has been stagnant over the years while the neonatal morbidity is on the rise (4).

In Sri Lanka, public health midwife (PHM) who is the trained health care provider visits postnatal mothers at home to deliver care for mothers and newborns. However, the national data records that only 77.3% postnatal mothers had received postnatal care by a PHM. This indicates that one in four mothers may have to take care of their newborn without the assistance of a health care provider at domiciliary settings within the critical first 10 days after delivery (4). Therefore, it is extremely important that mothers and primary care givers are knowledgeable and have right attitudes in caring for the newborn. This is also acknowledged in “Every Newborn Action Plan”, the joint venture of the World Health Organization (WHO) and United Nations Children’s Fund (UNICEF) to end preventable newborn deaths, as given in their fourth objective “to harness the power of parents, families and communities” (5).

It is essential that current level of mothers’ knowledge is assessed in empowering families further on newborn care. Literature around the world reports diverse findings on mothers’ knowledge influencing the newborn care, in addition to their level of education, age, socio-economic background and parity. Many studies reported from the Asian region including India (6-8), Pakistan (9) and Iran (10) highlight low levels of maternal knowledge on newborn care. In contrast, Sri Lanka has reported good levels of maternal knowledge on new born care, due to the higher educational level among females in the country and many other associated factors (11-12). However, the knowledge assessed across these local studies does

not comply with all the evidence-based interventions proposed by the WHO and UNICEF (13). This poses difficulty in scheduling programmes to upgrade mothers’ knowledge on these interventions.

This study describes postnatal mothers’ knowledge on evidence-based interventions on the care of newborns at home and barriers for having a low level of knowledge on newborn care. Public health programs can focus on such identified poor knowledge components and barriers to improve the mortality and morbidity of newborns.

Methods

We carried out a hospital-based, cross-sectional study in all five postnatal wards at the Castle Street Hospital for Women (CSHW), the premier maternity hospital located in Colombo district. The study population consisted of mothers who delivered at CSHW during the period from August to October in 2014. Mothers were recruited from all postnatal wards by non-probability consecutive sampling using labour room registers. Mothers who have had still births or early neonatal deaths; whose newborns were admitted to neonatal intensive care unit or special baby care unit; and diagnosed with psychiatric illnesses or mental retardation were excluded from the study. The sample size decided was 422 based on an expected proportion of 64.4% of mothers having satisfactory overall knowledge on newborn care according to a local study (8), with a precision of 5%, an alpha value of 1.96 and 10% non-response rate.

A pre-tested, interviewer-administered questionnaire which was subjected to judgmental validation was used for data collection. The knowledge component of the questionnaire was developed based on the evidence-based interventions identified by the WHO-UNICEF joint guidelines for newborn care, published in 2009 (13). The core knowledge that a primary care giver of a newborn should have in order to care for the baby was extracted from the guidelines, and was transformed into questions, which could be easily understood by a lay person. Content validity of the initial questionnaire was further improved by a panel of experts consisting of consultant neonatologists, consultant community physicians, nurses and public health midwives working in postnatal units. The final construct assessed mothers’ knowledge on five sub-components recognized by the WHO-UNICEF joint guidelines on newborn care

namely, breast feeding, hygienic care, prevention of hypothermia, immunization, and identification of danger signs (13). Upon recommendations by the expert panel, two more sub-components to assess mothers' knowledge on basic emergency care and health care services available to them at the state sector were added to the questionnaire. There were 50 questions on the knowledge category under these seven sub components. Data were also collected on basic socio-demographic and other potential factors associated with maternal knowledge on newborn care, and seven statements to assess mothers' attitudes towards newborn care based on the consensus of the expert panel. Having obtained informed written consent, two female doctors administered the questionnaires to mothers in local languages (Sinhala and Tamil) before they were discharged from the postnatal wards.

Data analysis was carried out using Statistical Package for Social Sciences (SPSS) software version 20. Open ended questions were coded appropriately and equal weightage was given to all the questions to make the total score as 50. This final score was multiplied by two to make the final score of 100 marks. An arbitrary scoring system was developed to describe the participants' level of knowledge as follows. Above or equal to 75 marks was termed 'Good', 74-50 marks as 'Satisfactory' and below or equal to 49 marks as 'Poor'. Each health favourable response to attitudinal statements was given 5 marks and each health unfavourable response was given zero marks, bringing the total to 35 marks. Participants who possessed a final score above 25 out of 35 were considered as having 'health favourable attitudes'.

The study sample was further dichotomized by the median overall score into 'good' and 'poor' knowledge categories to assess the associated factors. Factors associated with knowledge and attitudes were tested for statistical significance using prevalence odds ratio (OR) and 95% confidence interval (CI). Finally, to account for the confounding effects, associations were tested using multivariate regression.

Results

All eligible mothers consented to participate in the study, giving a response rate of 100%. As shown in Table 1, the study sample ranged from 19 years to 44 years. Their mean was 29.7 years (SD=5.7). Even though 85.8% mothers (n=362) had attended antenatal

health education sessions, where health professionals educate pregnant women on newborn care, only 24.6% (n=89) of them had attended all three classes as expected.

Figure 1 displays the differences between the median scores of different subcomponents assessed under overall knowledge. Mean score of the composite variable 'overall knowledge' was 72.7 out of 100, and median was 74.0%. Among the sub-components assessed within overall knowledge, identification of danger signs recorded the highest median score of 81.3%, while knowledge on basic emergency care was very poor with a median score of 47.2%.

After dichotomizing the sample into 'good' and 'poor' knowledge levels by the median knowledge score of 74 out of 100. Findings of key interest were the associations of good knowledge with being educated above GCE O/Level ($p<0.001$), having more than one child ($p<0.001$) and attending antenatal parent craft classes conducted by health professionals ($p=0.002$) (Table 2). Predictors of good maternal knowledge on newborn care were confirmed based on the multivariate analysis (Table 2). All the variables identified with a p value less than 0.2 in the univariate analysis were included in the model. The analysis retained being educated above GCE Ordinary Level ($p=0.002$), having more than one child ($p=0.02$) and attendance at antenatal parent craft classes ($p=0.001$) as predictors of good maternal knowledge. Maternal age, preparedness for pregnancy, family income, structure of the family and antenatal complication were not predictive of maternal knowledge.

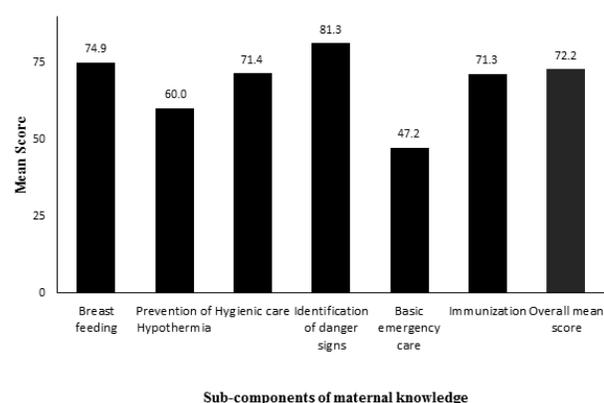


Figure 1. Median scores of the sub-components of maternal knowledge on newborn care practices

Table 1. Basic socio-demographic and pregnancy related characteristics of the study sample (N=422)

Characteristic	No.	%
Age (years)		
< 30	207	49.1
≥ 30	215	50.9
Parity		
1	67	15.7
2	263	62.5
3	78	18.5
>3	14	3.3
Ethnicity		
Sinhalese	362	85.8
Moor	35	8.3
Other ¹	25	5.9
Highest educational attainment¹		
≤ GCE O/Level	180	42.7
> GCE O/Level	242	57.3
State of employment		
Employed	114	27.0
Not employed	308	73.0
Monthly family income (Rs.)		
≤ 25,000	167	39.6
> 25,000	255	60.4
Family structure		
Extended family	201	47.6
Nuclear family	221	52.4
Pregnancy preparedness		
Yes	316	74.9
No	106	25.1
No. antenatal health education sessions attended (out of three)		
0	60	14.2
1	168	39.8
2	105	24.8
3	89	21.0
Antenatal complications		
Yes	82	19.4
No	340	80.6

¹ General Certificate of Education (Ordinary Level)

Table 2. Associations between level of knowledge of the study participants on newborn care and selected socio-demographic and pregnancy related factors

Factor	Total	Good knowledge No. (%)	Crude OR ³ (95% CI)	Adjusted OR ^{3,4} (95% CI)
Age				
< 30 years	353	314 (88.9)	1.6 (0.6-4.2)	-
≥ 30 years	69	64 (92.7)	1.0	
Parity				
First pregnancy	66	48 (72.7)	0.2 (0.1-0.3)	1.9 (1.1-3.6)
≥ More than one	355	330 (92.9)	1.0	1.0
Highest educational attainment¹				
≥ GCE O/Level	383	350 (91.4)	4.2 (1.9-9.1)	2.9 (1.5-6.0)
< GCE O/Level	39	28 (71.8)	1.0	1.0
Pregnancy preparedness				
Planned pregnancy	316	285 (90.2)	1.3 (0.6-2.5)	-
Unplanned pregnancy	106	93 (87.7)	1.0	
Participation at least one AN parent-craft classes²				
Yes	362	331 (91.4)	2.9 (1.4-6.0)	2.3 (1.5-3.7)
No	60	47 (78.3)	1.0	1.0
Monthly family income				
Rs. ≤ 25,000	167	142 (85.0)	2.2 (1.2-4.1)	-
Rs. > 25,000	255	236 (92.5)	1.0	
Family structure				
Nuclear	221	209 (94.5)	0.3 (0.2-0.6)	-
Extended	201	169 (84.1)	1.0	
Antenatal complications				
Yes	82	71 (86.6)	0.7 (0.3-1.4)	-
No	340	307 (90.3)	1.0	

¹General Certificate of Education (Ordinary Level); ²antenatal

³Odds ratio calculated compared to the reference category; ⁴significant associations given in bold letters

Discussion

Study participants displayed good overall knowledge on newborn care, which is similar to the results obtained in local studies (11-12). Common cultural practice of seeking professional antenatal health care and willingness to accept educational messages by health professionals may have resulted in consistently

high knowledge levels of mothers in Sri Lanka. Even if the overall knowledge level is consistently high in local studies, poor knowledge demonstrated on some common areas in the current study needs the urgent attention of policy makers. For example, knowledge on hypothermia prevention and basic emergency care should be included in the curriculum of the antenatal parent-craft classes.

Results on maternal knowledge on newborn care vary widely across global literature. Good knowledge among mothers is recorded constantly in local studies (11-12) and also in studies done in the South East Asian and African regions (6, 8, 10, 14). Poor knowledge is also much prevalent throughout the world (7, 9, 15). Heterogeneity of the knowledge construct assessed across studies might have played a key role for the discrepancy of these findings, in addition to the actual knowledge levels of mothers.

Mother's level of education, attending antenatal health education sessions and higher number of living children were shown to be associated with good level of knowledge independent of other factors. Level of education has shown contrasting results in previous local studies. Praneeth (2009) describes better educational levels to be linked with better knowledge of mothers in Sri Lanka, while Senarath and colleagues (2007) did not find the educational level of mothers to be linked with good level of knowledge. Findings from international studies also report incoherent results. Low level of education is proven to be a predictor for poor maternal knowledge in some studies (16-19), while some show no association (14). As one with good level of education is anticipated to have better knowledge on newborn care, methodological flaws might have affected the results of studies showing non-significant associations. Having more than one child is described to be associated with knowledge levels in many local as well as global studies (11, 14, 18) similar to the current study. This is an anticipated association, as a mother can be expected to gain knowledge with experience.

Similar to many other studies (14, 18-19), attending antenatal health education sessions was identified as a predictor of good knowledge levels. These results are compatible with expected improvement of mothers' knowledge following health promotion received at these sessions. However, the current study failed to detect a higher knowledge level among mothers who planned their pregnancies beforehand or those who received professional antenatal care. Likewise, Mangwi-Ayiasi et al (19) and Senarath (11) failed to demonstrate antenatal consultations with health professionals leading to improved maternal knowledge. This identifies the importance of educating mothers specifically on newborn care, rather than assuming that receiving professional antenatal care or preparedness of the mother for pregnancy and child birth implies one is knowledgeable in caring for their newborn.

Conclusions and Recommendations

Majority of mothers in the study sample had good overall knowledge on newborn care. However, knowledge on some essential areas such as prevention of hypothermia and basic emergency care which play a pivotal role in health outcome of the newborn was found to be low. As a result, inclusion of these subject areas in the curriculum of antenatal health education sessions is strongly endorsed by this study, in order to further improve the new born mortality and morbidity in the country.

This study also recognizes first pregnancy, low educational attainments and not attending parent-educational classes during antenatal period as barriers for the mother to provide better care for the newborn. It is essential that health care workers are made aware of these facts, with the view of paying special attention to such mothers during antenatal period. Furthermore, PHMs who provide domiciliary care for postpartum mothers and newborns should be instructed to prioritize visiting such mothers within first five days after the delivery without fail. In addition, this study strongly recommends encouraging pregnant mothers' participation at antenatal health educational sessions, which is the only modifiable factor to improve the care of newborns by the time they present to the health system with a pregnancy. How best to achieve this objective of improving participation of mothers in antenatal parent educational classes is another area for future research to explore.

Public health implications

Newborn mortality and morbidity indicators represent the quality of maternal and newborn health care system of a country. Stagnation of indicators reflects the necessity of revisiting the interventions. This study reveals areas of poor knowledge among mothers that are essential in caring for the newborn. Knowledge on these areas can be improved by incorporating the topics into the on-going antenatal parent craft classes conducted by public health teams working at grass root levels. This study also identifies types of mothers who need more support from health care providers to take care of the newborn. This knowledge will ensure provision of better care to those families for improving the equity of health services in return.

Author Declarations

Competing interests: The authors declare no conflicts of interest.

Ethical approval and consent to participate: Ethics approval for the study was obtained from the Ethics Review Committee of the University of Colombo and the Ethics Review Committee of the Castle Street Hospital for Women. Administrative permission was sought from the hospital director. All relevant consultant obstetricians and hospital matrons were informed of the study prior to data collection. Informed written consent was obtained from each participant. Data were collected anonymously and the interviews were carried out in a separate room to preserve the privacy of participants, with minimal disturbance to routine management of the mother and baby.

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Author contribution: SAH was the principal investigator of this study. She was involved throughout the study from formulation of the research questions, designing the methods, preparation and finalizing the data collection instrument, pre-testing and supervision of data collection, data analysis and the article writing. DR was the technical supervisor of this study. Her contribution involved supervision of all the steps from formulation of the research question up to the writing of the article, with her expert knowledge on public health and new born care in Sri Lanka.

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