



## ASSESSMENT OF KNOWLEDGE & SKILLS OF STAFF INVOLVED IN PROVIDING ROUTINE NEW-BORN CARE AT VARIOUS PUBLIC HEALTH FACILITIES OF RAJKOT DISTRICT

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### ABSTRACT

**Background:** The first hour after birth have a major influence on the survival, future health and well being of a newly born infant. The care health care providers give during this period is critical in ensuring infant survival.

**Aim:** to evaluate the knowledge and skills of health care providers, regarding routine newborn care.

**Methods:** It was a cross sectional observational study conducted during August 2013 to October 2013 at 36 Government health facilities of Rajkot district. Study participants were doctors and nursing staff working at different level of Newborn care facilities. Pre-tested semi-structured questionnaire was used for data collection. Their skills were assessed by simulation on a mannequin.

**Results:** Less than one third of the staff knew all the signs of attachment for breast feeding. It was noted that the staff members trained in New-born care (NBC) services demonstrated better skills for neonatal resuscitation, prevention of hypothermia, breast feeding skills, etc than those untrained in the same. There was positive co-relation between duration of work experience and skills score.

**Conclusions:** The knowledge and skills of health staff in routine NBC was not satisfactory. Experienced and staff trained in routine New born care services, had higher skills for the same.

**Key-words:** Assessment, Health staff, Knowledge, Routine newborn care, Skills

### INTRODUCTION

Of the 3.1 million newborn deaths that occurred globally in 2010, a quarter to half of them occurred within the first 24 hours after birth. <sup>1</sup> India carries the single largest share (around 25-30%) of neonatal deaths in the world. Neonatal deaths constitute two-thirds of infant deaths in India; 45% of the deaths occur within the first two days

of life. It has been estimated that about 70% of neonatal deaths could be prevented if proven interventions are implemented effectively with high coverage. <sup>2</sup>

The infant mortality rate in India has remained almost unchanged since the early nineties, and the near-static rate of neonatal mortality, despite introducing several primary care-based strate-

gies and programs at the national level.<sup>3</sup> The rate of decline in neonatal mortality rate in India is slow (38/1000 live births in 2004 to 29/1000 live births in 2013).<sup>4</sup>

A neonate experiences rapid change of physiology at birth and during initial few days of life. This is the period when many infants would fall sick and may even die. New-born care (NBC) is therefore very important and can lay a good foundation for healthy childhood.<sup>5</sup> Common causes of neonatal mortality in India are hypothermia, asphyxia, sepsis and respiratory distress; many of which are preventable.<sup>6</sup>

The first hour after birth have a major influence on the survival, future health and well being of a newly born infant. The health care providers have an important role at this time. The care they give during this period is critical in helping to prevent complications and ensuring infant survival. The four basic needs of all babies at the time of birth are: Warmth, Normal breathing, Mother's milk and Protection from infection. As these basic needs indicate, a baby's survival is totally dependent upon caregivers. Therefore it is important to provide proper care to all the neonates immediately after birth. All newborns require essential newborn care to minimize the risk of illness and maximize their growth and development. This care will also prevent many newborn emergencies.<sup>7</sup> So, in order to improve the newborn survival, Government of India (GOI) has launched Navjat Sisu Suraksha Karyakram (NSSK)<sup>8</sup> and Facility Based Newborn Care (FBNC).<sup>9</sup>

There are lots of studies describing New-born care practices by the community but there is paucity of literature regarding studies assessing knowledge and skills of service providers.<sup>10-12</sup> Correct knowledge regarding routine NBC and expertise in these skills will lead to provision of quality NBC services thereby ensuring the survival of newborn. Hence it is very important that the staff members who attend the deliveries are aware of routine care of newborn and competent in skills required for NBC. So, in this context the present study was conducted to evaluate the knowledge and skills of health care providers, regarding routine NBC.

## MATERIAL AND METHODS

It was a cross sectional observational type study conducted during August 2013 to October 2013 at various government health facilities of Rajkot district. Only those facilities where facility based

Newborn Care Corner (NBCC) were available, were taken up for study. Out of 46 Primary Health Centres (PHC) in Rajkot district, ten PHCs were 24 x 7 as per list provided by Jilla Panchayat Rajkot. All these 24x7 PHCs had NBCC and were included in the study. All 15 CHC/FRUs of Rajkot district had NBCC and were included in the study. Similarly all the five sub district hospitals having NBCC or New Born Stabilization Unit (NBSU) and district hospital / medical college hospital having NBCC, NBSU or Specialized New Born Care Unit (SNCU) were included in the study.<sup>9</sup>

Study participants were doctors and nursing staff working at different level of Newborn care facilities. All doctors, nurses / Auxiliary Nursery Midwives (ANMs) / Female Health Workers (FHWs) who were involved in facility based newborn care and were working at different levels of government health facility were informed about date of visit and were asked to remain present at the time of visit. After explaining clearly the purpose of the study, their verbal consent was taken and only thereafter they were further questioned regarding routine newborn care, following which their skill was assessed for the same.

Seven vital skills pertaining to resuscitation, prevention of infection and hypothermia were assessed through simulation on a mannequin. Each correctly performed skill, was given a score of two, while a score of one or zero was awarded to partially correct or incorrect demonstration of skill, respectively. The final score of skills for each participant was presented as percentage of the maximum score. Since all the skills described were very simple to perform yet vital for the survival of the newborn, we had classified the staff members as having at least 85% or more of the total score for skills. Ethical clearance was taken from the Institutional Ethical Committee of the college to conduct the present study.

Thirty-six health facilities (NBCC - 32, NBSU - 2, SNCU - 2) were included in the study. From these 36 facilities, 34 doctors, 57 staff nurses, 6 ANMs and 4 resident doctors of Pediatrics department were included in the study, so a total of 101 health personnel were studied. Pre-tested semi-structured questionnaire was used for data collection. Their skills were assessed by simulation on a mannequin. The data was entered and analyzed in Epi Info version 3.5.1. (CDC, Atlanta) software<sup>13</sup> and appropriate statistical tests

were used. Mann Whitney U test was applied online.<sup>14</sup>

## RESULTS

All the 32 health facilities visited had NBCC facility while NBSU was available only in two of the five sub-district hospital. Similarly the staff members of both the SNCU of the district level hospitals were also included in the study. Table 1 shows that on an average about 50 – 70 % of the

staff members dealing with new-born care (NBC) services were trained in NSSK. While it was surprising to find that very few or almost none of the staff were trained in Facility Integrated Management of Neonatal and Childhood Illness (FIMNCI)<sup>15</sup> or FBNC. These trainings form the backbone to successful management of new-born health conditions indicating the urgent need for the same. Nearly 90% of the staff involved in new-born care had more than a year's experience.

**Table 1: Training status and work experience of various health personnel in delivery of newborn care services**

Designation	Pediatrician	Resident (Paediatrics)	MO* (MBBS)	MO (AYUSH) †	Staff Nurse	ANM‡	Total
No.(%)	05 (5.0)	04 (4.0)	25 (24.8)	04 (4.0)	57 (56.4)	06 (5.9)	101(100)
<b>Training status</b>							
NSSK§	01 (20.0)	04 (100)	13 (52.0)	03 (75.0)	42 (73.7)	05 (83.3)	68 (67.3)
FIMNCI	01 (20.0)	00 (0.0)	07 (28.0)	00 (0.0)	07 (12.3)	01 (16.7)	16 (15.8)
FBNC**	01 (20)	00 (0.0)	00 (0.0)	00 (0.0)	00 (0.0)	01 (16.7)	02 (1.9)
<b>Duration of involvement in Newborn care services</b>							
< 1 year	00 (0.0)	01 (25.0)	04 (16.0)	00 (0.0)	05 (8.7)	01 (16.7)	11 (10.9)
1 – 5 years	03 (60.0)	03 (75.0)	19 (76.0)	03 (75.0)	24 (42.1)	04 (66.7)	56 (55.4)
5 – 10 years	01 (20.0)	00 (0.0)	01 (4.0)	01 (25.0)	14 (24.6)	01 (16.7)	18 (17.8)
> 10 years	01 (20.0)	00 (0.0)	01 (4.0)	00 (0.0)	14 (24.6)	00 (0.0)	16 (15.8)

\*MO – Medical Officer; †AYUSH – Ayurveda, Yoga and Naturopathy, Unani, Siddha, Homeopathy (Practitioners of alternate system of Medicine; ‡ANM – Auxilliary Nurse Midwife; §NSSK – Navjat Sisu Suraksha Karyakram; || FIMNCI – Facility Integrated Management of Neonatal and Childhood Illness; \*\* FBNC – Facility Based Newborn Care

**Table 2: Distribution of respondents according to their knowledge about various aspects of routine newborn care**

Knowledge regarding	Paediatrician (n=5)	Resident (Paediatrics) (n= 4)	MO (MBBS) (n= 25)	MO (AYUSH) (n= 4)	Staff Nurse (n= 57)	ANM (n= 6)	Total (n= 101)
Minimum temperature of delivery room	02 (40.0)	02 (50.0)	11 (44.0)	02 (50.0)	19 (33.3)	03 (50)	39 (38.6)
Timing of switching on warmer	01 (20.0)	03 (75.0)	11 (44.0)	00 (0.0)	28 (49.1)	00 (0.0)	43 (42.6)
Placing baby immediately after normal delivery	05 (100)	04 (100)	20 (80.0)	04 (100)	44 (77.2)	06 (100)	83 (82.2)
Eye care of newborn at birth	05 (100)	04 (100)	16 (64.0)	02 (50.0)	41 (71.9)	03 (50)	71 (70.3)
Signs of good attachment for BF	04 (80.0)	01 (25.0)	06 (24.0)	00 (0.0)	17 (29.8)	01 (16.7)	29 (28.7)

MO=Medical Officer

**Table 3: Distribution according to skills of respondents about various aspects of routine newborn care**

Correct simulation of skills regarding	Paediatrician (n=5)	Resident (Paediatrics) (n= 4)	MO (MBBS) (n= 25)	MO (AYUSH) (n= 4)	Staff Nurse (n= 57)	ANM (n= 6)	Total (n= 101)
Hand washing	3 (60.0)	2 (50.0)	7 (28.0)	2 (50.0)	26 (45.6)	6 (100)	46 (45.5)
Stimulation of baby	5 (100)	4 (100)	19 (76.0)	3 (75.0)	44 (77.2)	5 (83.3)	80 (79.2)
Umbilical cord cutting (at 2-3 cm)	4 (80.0)	1 (25.0)	10 (40.0)	2 (50.0)	19 (33.3)	3 (50.0)	39 (38.6)
Drying and covering of the baby	4 (80.0)	2 (50.0)	21 (84.0)	3 (75.0)	40 (70.2)	5 (83.3)	75 (74.2)
Recording body temperature of baby	2 (40.0)	4 (100)	6 (24.0)	2 (50.0)	10 (17.5)	3 (50.0)	27 (26.7)
Kangaroo Mother Care	3 (60.0)	4 (100)	12 (48.0)	3 (75.0)	43 (75.4)	3 (50.0)	68 (67.3)
Baby's positioning for Breast Feeding	4 (80.0)	1 (25.0)	17 (68.0)	3 (75.0)	39 (68.4)	5 (83.3)	69 (68.3)

Table 2 describes the knowledge of staff members regarding a few critical aspects of routine NBC. As per the guidelines of NSSK, <sup>8</sup> the temperature of delivery room to prevent hypothermia to the new-born must be above 25°C. Warmer must be switched on at-least half an hour prior to delivery. The baby must be provided Kangaroo Mother Care or placed under a warmer after drying immediately after delivery.

**Table 4: Distribution according to score obtained by health personnel in skill assessment (routine care)**

Health personnel	Score	
	≥85 (n=32)	< 85 (n=68)
Pediatrician	03 (60.0)	02 (40.0)
Residents (pediatrics dept)	01 (25.0)	03 (75.0)
Medical Officer (MBBS)	04 (16.0)	21 (84.0)
Medical Officer (AYUSH)	01 (25.0)	03 (75.0)
Staff Nurse	23 (40.4)	34 (59.6)
ANM	01 (16.7)	05 (83.3)

Figure in parenthesis indicate percentage

**Table 5: Difference between total skill's score obtained to designation and training status of Health staff**

Health Staff	Median of skill's score (range)	Mann Whitney U: Z value	P value
Doctor*	71.3 (00.0 - 100)	1.408	0.159
Other staff†	77.5 (37.5 - 97.5)		
Trained in NSSK‡	77.5 (37.5 - 100)	3.511	0.000
Untrained in NSSK	65.0 (00.0 - 100)		
Trained in FIMNCI§	82.5 (37.5 - 100)	1.584	0.113
Untrained in FIMNCI	72.5 (00.0 - 100)		

Since only two staff members were trained in FBNC||, no statistical test could be applied

\*Pediatrician, Residents, MO, AYUSH; † Staff Nurse, FHW; ‡NSSK - Navjat Sisu Suraksha Karyakram; §FIMNCI - Facility based Integrated Management of Neonatal and Childhood Illness; || FBNC - Facility based newborn care

The eyes of the new-born should be cleansed with a cotton swab, separate for each eye and dipped in normal saline or sterile water, from medial to lateral canthus. Currently, there is insufficient evidence to recommend the routine antibiotic prophylaxis for prevention of ophthalmia neonatorum in Indian settings. <sup>7</sup> About 50 to 70% of the staff members had correct knowledge about care of newborns eye at birth.

Table 3 assesses the skills of staff members regarding various aspects of routine NBC, simulat-

ing them on a mannequin. Correct hand washing skills, an important step to prevent infection amongst babies was correctly demonstrated by only 45% of the staff members. The umbilical cord should be clamped at 2-3 cm away from the abdomen using a commercially available clamp, a clean and autoclaved thread or a sterile rubber band. <sup>7</sup> Less than 40% of the staff members were able to properly clamp the cord at proper distance from the abdomen.

The baby should be dried and cleaned at birth with a clean and sterile cloth. The cleaning should be gentle and should only wipe out the blood and the meconium and not be vigorous enough to remove the vernix caseosa (white greasy material on the skin). The vernix, protects skin of the infant and helps maintain temperature. Any wet linen should not be allowed to remain in contact with the infant. The infant may be placed on the mother's abdomen immediately after the birth to ensure early skin-to-skin (STS) contact with the mother. <sup>7</sup>

Nearly three fourth of the staff members were able to simulate proper drying and covering of the baby. Over 67% of them were also able to demonstrate correct positioning for KMC. However, only a quarter of them were able to correctly record the body temperature of the baby. Similarly, less than 70% of the staff members were aware of correct positioning of the baby for BF and knew all four signs of good attachment of the baby.

Table 4 classifies the staff members based on total score obtained for skills simulation. Since all the skills described above are very simple to perform yet vital for the survival of the newborn, we had classified the staff members as having at least 85% or more of the total score for skills. We found 60% of the paediatrician, 40% of the staff nurse, 25% of the residents and MO-AYUSH and 16% of MO-MBBS and ANM had scored more than 85%.

Table 5 shows the relation between training status of the staff members and the score obtained by them. It was noted that the staff members trained in New-born care services like NSSK had a significantly higher score than those untrained in the same. Similarly the staff members trained in FIMNCI had a higher score than those not trained in FIMNCI. However this difference was not significant.

A significant spearman's correlation of  $r = 0.207$ ,  $p = 0.038$  was observed for duration of involve-



ment in newborn care and total skill's score obtained in routine newborn care.

## DISCUSSION

Only 40% of the staff members had correct knowledge regarding minimum temperature of the delivery room or timing to switch on the warmer. However the good part is that over 80% of them were aware regarding providing KMC or placing the baby under the warmer immediately after delivery particularly for low birth weight babies. This is one of the most critical step to prevent hypothermia and thereby death of the baby [Table 2].

The skills of the staff members in preventing hypothermia in newborn as well as providing KMC were grossly inadequate [Table 3]. This is a great setback to successfully reducing the Infant mortality rate at par with that of developed countries.

There are several evidence-based low cost and universally applicable interventions available that can improve the survival of newborn babies. For example skin-to-skin contact between the mother and her baby immediately after birth improves mother-infant bonding, keeps the baby warm, and helps the mother to breastfeed her baby successfully.<sup>16</sup>

Early initiation and maintenance of exclusive breast feeding along with Kangaroo Mother Care to prevent hypothermia amongst newborns may play a significant role in reducing the morbidity as well as mortality of newborn babies.<sup>17 - 21</sup> There are several studies available predicting a decrease in neonatal mortality in range of 41 to 72% from universal coverage of these low cost interventions.<sup>22 - 24</sup>

The importance of BF lies far beyond just feeding the baby. It prevents malnutrition, promotes health and thereby enhances survival of the baby.<sup>7</sup> Only counselling for breastfeeding without any guidance and support for proper positioning and attachment of the baby is less likely to result into successful breast feeding practices.<sup>25</sup> The health provider should be proactive in supporting the mother to develop correct breast feeding practices. The lack of knowledge of staff members regarding signs of attachment and inability to simulate correct positioning of the baby for breast feeding highlights the reluctance of the staff members in this crucial step to promoting infant survival.

It was clear from table 4 that the score of paediatrician and staff nurse was more as compared to rest of the staff members. The comparison also highlights the weaker links in service delivery that needs to be strengthened to improve newborn survival further. However since the sample size of a few of staff members was very small, the data needs to be interpreted with caution.

Table 5 highlights the importance of training of staff members in NBC services particularly NSSK training. However in table 1 it was noted that only 67% of staff members were trained in NSSK. Also only a few (15%) were trained in FIMNCI and almost none (1.9%) had received training of FBNBC. These trainings are of pivotal importance in capacity development of health staff and thereby their contribution to the community in improving NBC services.

A randomised controlled trial in rural Zambia in 2011 showed around 45% reduction in neonatal mortality for home deliveries that were conducted by traditional birth attendants (TBA) who were given training in newborn care (viz. prevention of hypothermia and resuscitation procedures) as compared to those who were untrained for the same.<sup>26</sup>

## CONCLUSION

There was no major difference in the knowledge and skills amongst various cadres of health staff in regard to routine NBC. However considering the importance of care for newborn survival, the performance of health staff in routine NBC was far from satisfactory.

The staff members who were trained in routine NBC, particularly NSSK, performed significantly better in skills than those untrained. This highlights the need of training the staff members in requisite skills for NBC.

There was positive co-relation between duration of work experience and skills score which further stressed the importance of experienced staff in NBC.

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