



Evaluation of New born Stabilization Units in the Health Facilities in Uttarakhand, India

Anusha Sharma¹; Meenakshi Khapre²; Surekha Kishore³

Financial Support: National Health Mission (NHM), Uttarakhand.

Conflict of Interest: None declared

Copy Right: The Journal retains the copyrights of this article. However, reproduction is permissible with due acknowledgement of the source.

How to cite this article:

Sharma A, Khapre M, Kishore S. Evaluation of New born Stabilization Units in the Health Facilities in Uttarakhand, India. Natl J Community Med 2020;11(4):166-170

Author's Affiliation:

¹MPH Student; ²Assistant Professor; ³HOD and Professor, Dept. of Community and Family Medicine, AIIMS, Rishikesh

Correspondence

Anusha Sharma
sharmanusha04@gmail.com

Date of Submission: 03-04-2020

Date of Acceptance: 16-04-2020

Date of Publication: 30-04-2020

ABSTRACT

Background: Our country is adding to one-fifth of live births globally and an enormous number of neonatal deaths (<25%). In India, although the number of new-born stabilization units (NBSU) reported operational is increasing but there is lack of clarity of the role of NBSUs as well as suboptimal utilization and quality of services in these units.

Material and method: A cross-sectional study was conducted from December 2017 to Jan 2018 in health facilities with functioning NBSUs in three blocks of Haridwar and two blocks in Tehri.

Results: Out of total 2602 deliveries, 221 neonatal admissions were reported with an average length of stay at the hospital in most of the centres was one and a half-day. There were a limited number of trained doctors and nurses in the health facilities. The maximum deficit was found with the availability of resuscitator and oxygen cylinder (80%) followed by a digital thermometer (75%).

Conclusion: To ensure essential care to the new-borns by keeping quality at the centre it is important to focus upon adequate number of medical staff, properly functioning equipment, continuous supply of medicines, regular training sessions and appropriate referral mechanism to higher centres.

Keywords: Neonatal mortality, Newborn care, Newborn Stabilization Units, Health facility, Utilization, India.

BACKGROUND

World widely, 2.5 million children died in the first month of their life in the year 2017, according to WHO. This equates approximately to 7000 newborn deaths every day that amounts to 47% of all under the age of five-year deaths.¹ A large number of neonatal deaths (75%) occurs during the first seven days of life. Our country adds to one-fifth of live births globally and greater than 25% of the neonatal deaths. Nearly, 0.75 million neonates died in India in 2013, the highest for any country in the world.²

Preterm birth complications and infections were identified as two important cause of neonatal death according to the systematic analysis of caus-

es of childhood mortality in 2013, whereas, nationally representative mortality survey reported pneumonia and diarrhoeal disease accounted for half of the total deaths at the age of one to five years.^{2,3}

In 2011 operational guidelines were devised to plan out appropriately functioning new-born care corners (NBCCs) at all the delivery points in a district, special new-born care units (SNCUs) at the district level and NBSUs at the first referral units. These guidelines aim to properly conduct the planning, establishment, functioning and regular monitoring of the new-born care facilities.^{4,5}

The NBSU is a facility which should be situated within or in close vicinity of the maternity ward. In

these units, the sick new-borns and the ones having low birth weight are taken care of. Along with the presence of a new-born care corner, each Community Health Centre (CHC) / First referral unit (FRU) should have a new-born stabilization unit. These facilities should be atleast 4 bedded with 24-hour uninterrupted power supply and running water supply. Equipment like radiant warmers, phototherapy unit, resuscitator, laryngoscope set (neonate), foot-operated suction pump, thermometer and syringe hub cutter is very important. One doctor and four full-time nurses who are trained in Facility-based integrated management of neonatal and childhood illnesses (F-IMNCI) should be posted in the NBSU.⁵

In Uttarakhand, 30 new-born stabilization units are functional, according to the Uttarakhand Health and Family Welfare Society.⁶ Though several new-born stabilization units reported operational is increasing it has been observed from field visits and reports that there is lack of clarity of the role of new-born stabilization units, suboptimal utilization and quality of services in these units. The reporting is irregular and inadequate with only in-born and outborn admissions. Immense focus needs to be put on the capacity building and strengthening of health care system.⁷

Therefore, employing this study we aspire to understand the functioning of new-born stabilization units in terms of the various services provided, infrastructure, manpower and human resources, the number of admissions, referral made, and the aseptic measures followed.

MATERIAL AND METHODS

A cross-sectional evaluative study was conducted in the health facilities in Haridwar and Tehri with functional new-born stabilization units. The study was carried out for a duration of two months in December 2017 to Jan 2018. The questionnaire was pre-validated by the experts.

Two districts of Uttarakhand i.e. Haridwar and Tehri were allotted by National Health Mission, Uttarakhand under innovative project Medical College as Knowledge partner. There are six blocks in Haridwar and three blocks in Tehri region with new-born stabilization unit facility. Of these, three blocks from Haridwar and two from Tehri were selected randomly.

The evaluation of the new-born stabilization units was done according to the Operational Guidelines on Facility-based new-born care (FBNC).⁸ Structured data collection tool was developed according to these guidelines. The information included the utilization of services (last year data on the number

of deliveries, neonatal admissions), Length of stay (calculated as the sum of days divided by the total number of new-born in the last three months), Human resources and Infrastructure (Availability of doctors and nurses; adequacy and availability of essential equipment, their functional status and reported breakdown time in months), and adherence to Aseptic practices. For aseptic practices the nursing staff was observed while handling the neonates in the new-born stabilization unit and pretested composite score was calculated.⁹

Composite Asepsis score

Factors	Points
24-hour running water	2 points
Elbow-operated wash basin in the NBSU	1 point
Availability of soap in the NBSU	1 point
Practice of hand-washing before entering the NBSU	2 points
Practice of hand-washing after touching every baby	2 points
Practice of wearing gowns in the NBSU	1 point
Practice of wearing slippers in the NBSU	1 point
Practice of wearing mask and caps in the NBSU	1 point

NBSU: New-born Care Corners

Neonatal admission rate is calculated as the percentage of neonatal admissions to total deliveries conducted in NBSU. Percentage of neonatal referred is calculated from total neonatal admissions.

Bed occupancy rate was calculated as the number of beds effectively occupied (bed-days) for new-born care divided by the number of beds available multiplied by 90 days (3 months).

The deficit in equipment is calculated as the proportion of current availability of equipment to the total recommended quantity.

Data analysis:

Data were analysed using IBM SPSS Statistics 23. Data is represented in the actual number and percentages using graphs and tables.

RESULTS

Evaluation of NBSUs in two districts i.e. Haridwar and Tehri was carried out. As adherence to the standard guidelines is very important for ensuring optimal care at the facilities, therefore, the performance evaluation was done based on operational guidelines of Facility-Based New Born Care.⁸

The total number of blocks with NBSUs in Haridwar is 6 and 3 in Tehri. Total five NBSU, three from Haridwar and two from Tehri were surveyed.

(i) Input: Manpower - Table 1 shows the number of total and trained doctors in Facility-based integrated management of neonatal and childhood illnesses (F-IMNCI). All the health facilities had one trained doctor except Community health centre (CHC) no 4. Table 2 depicts a shortage of staff nurse i.e. less than 4 in two centres.

The staff in these healthcare facilities was adequate and trained but do not feel competent in handling neonates because of the lack of hands-on training. Home-based newborn care (HBNC) training for resuscitation is going on for Staff nurse and is quite useful. However, if only one Medical Officer is posted in the centre then despite the training, he is reluctant to admit the newborn. Staff was not clear of Standard Operating Procedures related to NBSU admissions and there were gaps in knowledge and practice in neonatal skills.

Table 1. Availability of total and trained doctors at different health facilities

Facility	Total doctors	Trained doctors (%)
PHC I	2	1 (50)
CHC I	2	1 (50)
CHC II	4	2 (50)
CHC III	2	2 (100)
CHC IV	3	0 (0)

Table 2. Availability of total and trained nurses at different health facilities

Facility	Total nurses	Trained nurses (%)
PHC I	4	2 (50)
CHC I	3	3 (100)
CHC II	4	4 (100)
CHC III	3	2 (66.6)
CHC IV	4	2 (50)

Table 3. Availability of equipment and breakdown rate in the last six months at different centres.

Name of the equipment	Equipment (a)	Recommended quantity /centre (b)	Total quantity Recommended (c)	Deficit in equipment (a/c)	Breakdown time in months
Radiant warmer	5	3	15	66.6%	2
Phototherapy	4	1	5	20%	0
Electronic baby weighing scale	5	1	5	0	0
O2 Concentrator	4	Not required	Not required	NA	1
Oxygen cylinder	3	3	15	80%	0
Generator	5	1	5	0	0
Resuscitator	2	2	10	80%	2
Laryngoscope set	5	2	10	50%	0
Suction foot	2	1	5	60%	0
Digital thermometer	5	4	20	75%	0
Syringe Hub cutter	5	1	5	0	0

Table 4. Comparison of the number of deliveries with neonatal admissions rates, the average length of stay and bed occupancy rate.

Name of facility	Total deliveries	Neonatal admission (admission rate)	Neonates referred (% of neonatal admission)	The average length of stay in days (SD)	Bed occupancy rate
PHC 1	147	30(20.4%)	1(3.3%)	0.9(0.4)	2%
CHC 1	711	27(3.8%)	13 (48%)	1(0.6)	1.8%
CHC 2	754	65(8.6%)	59 (90%)	2.2(0.8)	8.9%
CHC 3	440	42(9.5%)	1(2.3%)	2.9(0.9)	8.6%
CHC 4	550	57(10.3%)	22 (38.6%)	1.2(0.4)	3.9%
Total	2602	221(8.5%)	96(43.4%)	1.6 (0.6)	5 %

Infrastructure- 4 bedded set up was present in all the health facilities evaluated. Floor area and the structure were as per the guidelines but there were two exit doors in some NBSUs.

Equipment and drugs- Table 3 shows the current availability of equipment, deficit as per recommendation and breakdown rate. The maximum deficit was found with the availability of resuscitator and oxygen cylinder (80%) followed by a digital thermometer (75%). Phototherapy unit was not available in one centre. Reported breakdown time

in the last six months was approximately 2 months for radiant warmer and resuscitator.

All essential drugs were available in the facilities but irregularity in the supply of the drug was noticed because of lacking inventory management.

Transport - Free transport was not timely available because of which the patients referred to other facilities had to make their transport arrangements most of the times.

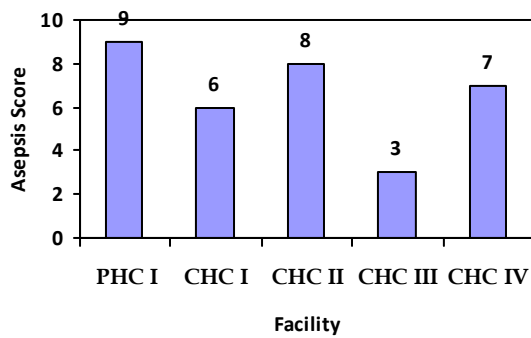


Fig. 1 Total asepsis score at different facilities

(ii) Process: Compliance to asepsis precautions- Figure 1 below illustrates the composite asepsis score in different facilities. Out of 10, scoring range from 3-10 (total score 11). In two facilities, there was no handwashing area adjacent to the labor room. In all the facilities hand washing after touching every baby was not practised. Wearing a mask was not strictly followed.

Understanding of roles and responsibilities- There was no clarity among staff concerning criteria of admission and discharge.

Record keeping and reporting- Record keeping was not as per guidelines. Reporting was being done quarterly and not monthly.

Referral- There was a problem in referral linkages to the higher centre due to long-distance and inability of staff to assure service at the next referral centre.

(iii) Output: Table 4 shows that in five health facilities, out of total 2602 deliveries, 221 neonatal admissions were reported (8.49%). The average length of stay at the hospital in most of the centres was one and a half-day. The neonates referred in the last one year was highest in Community health centre 2 i.e. 59 (90%) and lowest in Primary health centre 1 (PHC1) i.e. 1(3.3%). Bed occupancy rate was 5%. The most common reason for admission in new-born stabilization unit was Low birth weight and prematurity followed by asphyxia, respiratory distress, congenital malformations and sepsis.

DISCUSSION

This study is a cross-sectional assessment of the facilities where NBSU is present. Total five such facilities were evaluated, three in Haridwar and two in Tehri. In Uttarakhand, NBSUs are present in a total of 30 facilities. The NBSUs should be located within or close to the maternity ward and the new-borns not well and found to have low birth weight are taken care of.^{6,10} Establishment of the stabiliza-

tion units at the first referral unit is very important to facilitate care and resuscitation of new-borns, care of low birth weight new-borns, early initiation of breast feeding and referral to higher facilities.¹¹

The health facilities should be well equipped, but it is equally important to stress upon the availability of competent and well trained staff members.¹² According to March 2017 report by Uttarakhand department of health and family welfare, the total number of designated medical officers were 24 and designated staff nurse was 106.⁶ In the present study we found that in one of the facility there was no trained doctor. The importance of hands-on training was also identified; because of deficiency in this aspect, the staff was not confident while handling neonates. A study conducted in 19 NBSUs and 47 NBCC across six Indian states found that there were gaps in the knowledge and practice skills in providing neonatal care as there was lack of training plan at each level in the states.¹⁰ In another study conducted in rural Uganda across 20 health facilities found that to strengthen the healthcare system in providing essential care to the new-borns it is important to impart quality training to doctors and nurses.¹³ Giving rewards to the staff who are working in the rural areas and also giving them remuneration based on their skills.¹⁴

In this study, we found that four bedded set up was present in all the facilities. The total number of beds in 30 facilities were 121, as per the quarterly month reporting system as reported by Uttarakhand department of health and family welfare (March 2017).⁶ Deficiencies were seen with regard to many of the equipment such as the radiant warmers, phototherapy units, oxygen cylinders, resuscitator, laryngoscope, suction foot and a digital thermometer. These findings indicate that both availability, as well as maintenance of the equipment, should be regularly monitored. It is equally important to strengthen inventory management to ensure a continuous supply of drugs and medicines. In the present study, we came across the irregularity in the continuous chain of supply of drugs.

The record-keeping was assessed by checking the registers at the respective facilities and it was found that records were not complete and not in accordance with the national guidelines. The reporting to higher facilities was done quarterly rather than monthly reporting. Similar findings were seen in the rapid assessment study where the record-keeping was irregular.¹⁰

The total number of deliveries reported in the present study were 2602, out of which 221 neonates were admitted to the new-born stabilization unit. According to the quarterly month report out of 2739 live births, 735 neonatal admissions were

made to NBSU. Varying proportion of neonatal referral was found in the present study, ranging from 3% to 90%, whereas according to the quarterly report 556 referrals were made.⁶

One of the most important functions of the NBSU in the care of new-borns to prevent the occurrence of infection but in the present study, there was poor adherence to asepsis control. Similarly in the rapid assessment study, irregular infection control protocol was followed along with inadequate aseptic techniques.¹⁰

Another important finding is the inappropriate referral linkage to higher facilities because of which many new-borns are not able to receive timely care. The whole continuum of care is being curbed because of weak linkages of special newborn care units (SNCUs) with NBSU and NBCC.¹⁵

Future scope of the study

This study enlightens the functioning of new-born stabilization units and the various loopholes in this respect. Due to time constraints, we were not able to cover all the facilities, therefore, more extensive studies need to be conducted to delineate the various factors affecting the functioning of new-born stabilization units. Handholding from the experts of the medical college regarding the management of cases needs to be researched and a feasible option should be incorporated for quality functioning of new-born stabilization units.

CONCLUSION

The study is an attempt to address the potential challenges in the functioning of the new-born stabilization units. It is of utmost importance to have an adequate number of trained medical staff, properly functioning equipment, continuous supply of medicines, regular training sessions and appropriate referral mechanism to higher centres. There is an immense need to understand that the increasing number of new-born stabilization units should be in pace with the quality of care provided to the new-borns.

Acknowledgement

The authors are thankful to the National Health Mission (NHM), Uttarakhand for funds and granting permission for the study.

REFERENCES

1. WHO | Neonatal mortality [Internet]. WHO. [cited 2019 May 24]. Available from: http://www.who.int/gho/child_health/mortality/neonatal_text/en/
2. Liu L, Oza S, Hogan D, Perin J, Rudan I, Lawn JE, et al. Global, regional, and national causes of child mortality in 2000–13, with projections to inform post-2015 priorities: an updated systematic analysis. *The Lancet*. 2015 Jan; 385 (9966):430–40.
3. Basanni DG, Kumar R, Awasthi S, Morris S, Paul V, Shet A, et al. Causes of neonatal and child mortality in India: a nationally representative mortality survey. *The Lancet*. 2010 Nov; 376(9755):1853–60.
4. Chauhan M, Sharma J, Negandhi P, Reddy S, Sethy G, Neogi SB. Assessment of newborn care corners in selected public health facilities in Bihar. *Indian J Public Health*. 2016 Oct 1;60(4):341.
5. Facility Based Newborn Care (FBNC) Operational Guide Guidelines for Planning and Implementation.pdf [Internet]. [cited 2019 May 16]. Available from: <http://www.nihfw.org/Doc/>
6. MOHFW. Welcome to Uttarakhand Health & Family Welfare Society [Internet]. [cited 2020 Jan 20]. Available from: <https://www.ukhfws.org/detail.php?logtype=55&tokenID=111>
7. Rai SK, Kant S, Srivastava R, Gupta P, Misra P, Pandav CS, et al. Causes of and contributors to infant mortality in a rural community of North India: evidence from verbal and social autopsy. *BMJ Open* [Internet]. 2017 Aug 11 [cited 2020 May 7];7(8). Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC5577880/>
8. MOHFW. Govt of India. Facility Based Newborn care Operational guide [Internet]. MOHFW, Govt of India; 2011 [cited 2019 Sep 6]. Available from: http://164.100.130.11:8091/rch/FBNC_Operational_Guideline.pdf
9. Neogi SB, Malhotra S, Zodepy S, Mohan P. Assessment of Special Care Newborn Units in India. *J Health Popul Nutr*. 2011 Oct;29(5):500–9.
10. Prabhakar DPK. Rapid Assessment of NBSU and NBCC. :27. [cited 2020 Jan 20]. Available from: https://www.nhm.gov.in/images/pdf/nrhupdates/2nd_child_health/nbsu_assessment_pkp.pdf
11. UNICEF. Toolkit for Setting Up Special Care Newborn Units, Stabilisation Units and Newborn Care Corners [Internet]. [cited 2020 May 7]. Available from: https://nrhm.gujarat.gov.in/images/pdf/unice_scnu_toolkit.pdf
12. Malhotra S, Zodepy SP, Vidyasagaran AL, Sharma K, Raj SS, Neogi SB, et al. Assessment of essential newborn care services in secondary-level facilities from two districts of India. *J Health Popul Nutr*. 2014 Mar;32(1):130–41.
13. Namazzi G, Waiswa P, Nakakeeto M, Nakibuuka VK, Namutamba S, Najjemba M, et al. Strengthening health facilities for maternal and newborn care: experiences from rural eastern Uganda. *Glob Health Action* [Internet]. 2015 Mar 31 [cited 2020 May 7];8. Available from: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC4385205/>
14. Moxon SG, Lawn JE, Dickson KE, Simen-Kapeu A, Gupta G, Deorari A, et al. Inpatient care of small and sick newborns: a multi-country analysis of health system bottlenecks and potential solutions. *BMC Pregnancy Childbirth*. 2015 Sep 11;15(Suppl 2):S7.
15. Neogi SB, Khanna R, Chauhan M, Sharma J, Gupta G, Srivastava R, et al. Inpatient care of small and sick newborns in healthcare facilities. *J Perinatol*. 2016 Dec;36(S3):S18–23.