Internship Training

At

CIVIL HOSPITAL SIRSA

"Functional assessment of sick New-born care units in Haryana"

By

Saroj Mann

PG/14/054

Under the guidance of

Ms. Divya Aggarwal

Post Graduate Diploma in Hospital and Health Management

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IIHMR gave me a platform and desired skills where I was able to perform and complete my research.

It was a great learning experience.

SAROJ MANN

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ABBREVIATIONS

C-PAP	Continuous- Positive Airway Pressure
DEO	Data Entry Operator
FBNC	Facility Based Newborn Care
F-IMNCI	Facility Based Integrated Management of Neonatal and Childhood Illness
IUGR	Intrauterine Growth Restriction
IEC	Information Communication and Education
JSY	Jannani Suraksha Yojana
KMC	Kangaroo Mother Care
LAMA	Leave Against Medical Advice
LBW	Low Birth Weight
MOHFW	Ministry of Health and Family Welfare
NBCC	Newborn Care Corner
NBSU	Newborn Stabilization Unit
NICU	Newborn Intensive Care Unit
NMR	Neonatal Mortality Rate
NSSK	Navjaat Shishu Surakshya Kariyakarm
NHM	National Health Mission
OBC	Other Backward Class
RDS	Respiratory Distress Syndrome
SC	Schedule Caste
ST	Schedule Tribes
SNCU	Sick Newborn Care Unit
UNICEF	United Nations Child's Fund

ABSTRACT

Background: Neonatal mortality in India is high (25-30% of global NMR) and stagnant. There has been an increased emphasis on institutional birth, which demands improvement in facility based newborn care and client satisfaction. Public facilities provide newborn care at every point of childbirth. Newborn Care Corners (NBCC) at every point of childbirth, Newborn Stabilization Units (NBSUs) at Community Health Centers, Special Newborn Care Units (SNCUs) at district hospitals. SNCU units undergo several issues like deficiency of human resource, lack of adherence to protocols, overload of admissions, and shortage of equipments and take no notice of client satisfaction. The aim of the study was to assess the functioning of sick newborn care units in Haryana.

Methods: The study was conducted in 4 districts (Bhiwani, Sirsa, Rewari, Hisar) of Haryana. Parameters selected for study were admission criteria, human resource availability, adequacy of equipments, adherence to hygiene and sanitation protocol, facilities available to beneficiaries and outcome of newborn after successful discharge from SNCU units. Tracking of 545 newborn who were admitted in SNCU during the study period (1st august 2017- 30th october 2017) was done through phone calls to observe the outcome and the reason behind quitting of facility follow up. Structured interviews of 44 parents were conducted to understand the level of satisfaction regarding facilities available

Results: Among admitted newborns, cases of neonatal jaundice and sepsis were high. Only 20 % doctor posted in SNCU were trained in FBNC, NSSK and Observership in regional centres while almost 80% nurses were trained. Standard format for equipment calibration and repair and for cleanliness were not formed. Bed occupancy rate, ranged from 56% in sirsa to 77% in hisar. Lack of dummies to teach mothers about KMC and proper attachment during feeding. Hygiene and sanitation protocol were not followed by staff according to guidelines. First, follow up visit attended by 42 % newborns in which approximate 27 % attended because they had some problem. Level of satisfaction among parents was more in Hisar and least in Sirsa and Rewari.

Conclusion: Two third admitted newborns were suffering from neonatal jaundice and sepsis. Facility for breast-feeding and KMC were not adequate. There was a lack of data about instrument management. Human resource available in sufficient number but lack of training was an issue. Hygiene and sanitation protocol were not followed properly. There was a need of awareness regarding facility follow up to reduce dropouts. Overall, patient satisfaction score was less for hygiene and sanitation and behaviour of staff. There is a scope of improvement for proper functioning of sick newborn care units.

1. INTRODUCTION

A great number of Children die before celebrating their 5 birthday, about 3.3 million die during the neonatal period. The majority almost 3 million of these die within one week and 2 million of them die on their first day of life (SNCU Tool, IPGMER Kolkata). According to WHO neonatal mortality rate can be defined as death of newborn during first 28 days (0-27 days) per 1000 live births. It can be further categories as early and late neonatal mortality.

Globally, the neonatal mortality rate reduced from 36 deaths per 1000 in 1990 to 19 in 2015(WHO). Approximately 99 % newborn deaths occurred in developing countries. India alone contributes 25-30% of neonatal deaths globally with a rate of 28 deaths per 1000 live births (SRS, 2016).

Main causes reported worldwide for neonatal mortality are preterm (40.8%), intrapartum complication (27%), congenital disorder (10.6%), sepsis (8%), others (7.3%), pneumonia (4.8%), tetanus (1%) and diarrhoea (0.3%) (Oza et al, 2015) but in India most dominant causes are infections, birth asphyxia, and prematurity, which contribute to 32.8%, 22.3%, and 16.8% of the total neonatal deaths, respectively (SNCU Tool, IPGMER Kolkata) (Rakholia et al, 200) (Shaziya et al 2016). Almost 3 million babies can be saved by facility based or home based newborn care. It has been estimated that 70% deaths could be prevented if proven interventions are implemented effectively with high coverage. In India, the public health care system provides Facility-based newborn care (FBNC) under NHM by establishing Newborn Care Corners (NBCC) at every point of childbirth, Newborn Stabilization Units (NBSUs) at Community Health Centres, Special Newborn Care Units (SNCUs) at district hospitals and neonatal intensive care unit (NICU) at tertiary level for surgical interventions.

Presently, more than 500 SNCUs established in different parts of the country to provide facility based newborn care. They are established on the bases of “Purulia model” (Mahore, 2015). SNCU contributes to a 20% reduction in neonatal mortality between 2008 and 2013. Studies show that shortage of beds which results in sharing of beds by neonates, scarcity of trained staff, maintenance of equipment were the main problems in SNCUs(Oza et al, 2015) (Shaziya et al, 2016) (Neogi et al, 2014) (Malhotra et al, 2014) (Neogi et al, 2011) (Neogi et al, 2014). Lack of adherence to the admission and discharge guidelines and avoidance of hygiene protocol were also identified as rising problems. SNCU helps in reduction of NMR, however data to track performance, ensure accountability and initiate action is lacking (Neogi, 2013)

In India, one time establishment cost of a 12 bedded sick new born care unit is around 41,00,000 INR which includes resources like ancillary services, drugs, consumables, investigation etc. The running cost (excluding salaries of staff) comes to be 10, 00,000 INR. The average cost of treatment of per neonate is INR 4581, while per bed-day cost of treatment is 818 INR. Level 2

care of newborn comprises 0.8% of the country's health budget. Health outcomes highly depend upon monetary inputs (Neogi, 2013).

Patient satisfaction is one of the established parameter to measure success of the services being provided in the hospitals. Improved socioeconomic status, increase in institutional deliveries and cash benefits given to beneficiaries has led to high expectations and demands from consumers of hospital services. For a health care organization to be successful monitoring of customer's perception is a simple but important strategy to assess and improve their performance. Once the patient come to the hospital and experience the facilities, they may become either satisfied or dissatisfied. Human satisfaction is a complex concept that is related to a number of factors, including lifestyle, past experiences, future expectations and the value of both individual and society. Studies show that there is no evidence regarding levels of satisfaction of beneficiaries towards services provided to them (Ngaiyaye et al, 2016) (Yaman et al, 2014) (Wigert et al 2006).

In 2014, UNICEF in partnership with the Madhya Pradesh government developed an online monitoring system that records information related to mother and care in the SNCU and auto generates a follow up visits at designated intervals. This data help staff, managers and policy makers take evidence-based decisions. It was scaled up nationwide in 2015 because it is user friendly and feasible.

To achieve set goals for the reduction of neonatal mortality and increasing institutional delivery under government schemes like JSY, it demands more facility based care. A study shows that within 1 year of functioning, there had been a reduction in neonatal mortality rate among admitted cases by 4-40% across the SCNUs (Neogi et al, 2011). There is also a huge financial cost involved in setting up of SNCUs. An amount of 40-60 lakhs required to establish a single unit of SNCU. MOHFW spent 0.8% of the total health budget for their universilization (Malhotra et al, 2014). Therefore, it makes it obligatory to estimate the functioning of existing SNCUs to improve the cost –effectiveness and quality of care provided to beneficiaries.

Haryana successfully reduced infant mortality rate from 41 per 1000 live births in 2013 to 36 in 2016. However, neonatal mortality was generally stagnant (28/1000 live births in 2012 to 26/1000 live births in 2016 (SRS 2016). According to a study, 42,856 neonates require SNCU services in 1 yr but available services were only provided to 15,067 neonates while the actual capacity of SNCUs was to treat only 14,640 neonates (HSHRC Bulletin, 2014).

This study was conducted in four districts (Bhiwani, Rewari, Hisar and Sirsa) of Haryana. To focus on the goal of reducing neonatal mortality NHM establish three tier system to provide facility based newborn care. Studies were conducted to assess the functioning of SNCUs in different parts of country. Different studies point out on different type of problems related to functioning of SNCUs. However, no valid data is available on outcome of the newborns who are successfully discharged from SNCU and services available to the mother of sick newborn and level of satisfaction regarding the same services.

Hence, the aim of study is ‘Assessment of Sick Newborn Care Units in 4 districts hospitals of Haryana’.

Objective:

To assess the functioning of sick newborn care units in 4 district hospitals of Haryana.

Sub-objective:

- To assess the functioning of SNCU unit according to facilities and services available to sick newborns.
- To find the criteria of admission, morbidity and mortality among the sick newborns admitted in SNCUs.
- To find the outcome of newborns discharged from SNCUs successfully.
- To find the facilities available to the mother of sick newborn and level of satisfaction regarding these facilities.

2. REVIEW OF LITERATURE

India carries the single largest share 25-30% of neonatal deaths in the world. Nearly half of the death occurs within the first 2 days of life. About 4 million babies die each year worldwide in the first month after birth and India alone accounts for 0.76 million neonatal deaths. Major reasons of neonatal deaths are birth asphyxia, sepsis, LBW and prematurity. The global prevalence of LBW neonates is 15.5% and in India 27% of live birth are LBW. LBW comprises about 30% of SNCU admission, half of Perinatal and 1/3rd of neonatal deaths (Shaziya et al, 2016). The greatest success of life saving intervention occurs when hospital and community based activities are interlinked. It has been estimated that 70% deaths could be prevented if proven interventions are implemented effectively with high coverage. These interventions included exclusive breast feeding, warmth and prevention of infection. A combination of universal outreach and community care intervention at 90% coverage has been estimated to avoid 18-37% of neonatal deaths. These interventions include family care of the newborn, essential newborn care, resuscitation of the newborn, care for LBW and emergency newborn care.

On 18th Sept 2014, India Newborn Action Plan was launched in response to the Global Newborn Action Plan. INAP lays out a vision and a plan for India to end preventable newborn deaths, accelerate progress, and scale up high-impact yet cost-effective interventions. INAP has a clear vision supported by goals, strategic intervention packages, priority actions, and a monitoring framework. For the first time, INAP also articulates the Government of India's specific attention on preventing still births., it is expected that all stakeholders working towards improving newborn health in India will stridently work towards the attainment of the goals of "Single Digit Neonatal Mortality Rate by 2030" and "Single Digit Still Birth Rate by 2030" (Indian Newborn Action Plan, 2014). For achieving this goal of single digit neonatal mortality government of India, focus on strengthening of facility based newborn care as well as community-based care. To reinforce the facility based newborn care, government provide newborn care centre at every birth point i.e. NBCC at the point of birth, this area is mandatory for all health facilities where deliveries are conducted. NBSU in close proximity to ward where immediate care to sick and LBW is provided for short duration. SNCU, which provide special care (except assisted ventilation and major surgeries) for sick newborns. Any facility more than 3000 deliveries per year should have a SNCU in hospitals.

Health outcomes highly depend upon monetary inputs. To improve the cost –effectiveness, the outcome of admissions should be analyzed. In India bulk of admissions were because of birth asphyxia, LBW & sepsis. Birth asphyxia can be very well tackled at NBCC (Neogi, 2013)

In India: Number of beds proposed by National Neonatal Forum. It is based on the number of deliveries taking place in the district hospital, the proportion of babies who would require special care and average length of stay in hospital (7 days) and takes into account that 30% of babies would be born outside of hospitals. Calculations made on the assumption that on an average

3000 deliveries per year are conducted in the district hospital. As under JSYS institutional deliveries increases, so there is a need to calculate bed requirement based on current deliveries.

A study conducted by Sutapan Bandyopadhyay Neogi reveals that increase in admission in SNCU and shortage of bed handled by accommodating more than one neonate on each bed. The primary reason for this was increasing demand on community side and improve neonatal outcome through facility-based care. The study also focuses on the fact that discharge and admission criteria were not followed strictly, which result in premature discharge of babies, which affect their outcome adversely (Neogi, 2014)

Studies done in different settings uncover the problems faced by facilities like lack of trained staff, lack of adherence to the hygiene protocol, repair and maintenance of equipment, validation of data available were major concern. To track the newborn after discharge from SNCU units NMH joined with UNICEF to create an online portal. SNCU (Special New Born Care Unit) online project is the joint venture of UNICEF and State Government to protect Newborn Babies by providing specialized care after birth and until the neonatal period, especially to reduce the mortality of sick neonates. Special Newborn Care units are established at District level, these units are connected to this Web Application hence to the central database.

Salient features of web application.

- Vital basic information (Address and Mobile No. etc.) of admitted newborns.
- Detailed information about admitted neonates and their mother.
- Outcome and Treatment Profile.
- Strong community and facility follow-up tracking system.
- Reports and analytical graphs on 250+ parameters.

This portal contains the largest database of newborn babies for Ministry of Health and Family Welfare Department. This size of the application is grown in just 3 years. To date it contains almost 0.3 million newborn babies' records and their analytical data. Presently, it is functional in all established SNCUs units in public facilities.

Maternal and newborn bonding can be improved through breastfeeding and skin-to-skin contact and kangaroo mother care. It creates confidence; improve self-esteem of mother and making them feel close and responsible to take care of newborn. If staff updates them about condition of newborn time to time it helps in reducing anxiety and encourage them to participate in decision-making.

Most common problems experienced by parents seemed to be the negative attitude of the health care personnel's , unfavorable hospital conditions, extensive procedures , insufficient information about their newborn and visit restrictions posttraumatic stress disrupts parents lives as well as infant life in negative manner it may disturb physical and developmental and behavioral outcome of their high risk newborn. This negative effect of parents can negatively

affect family process and can cause neglect of other children in the family. Attitude and the way health professional communicate to the parent about diagnosis or condition of baby affect psychologically. a study done in turkey reveals that parents were not aware about the diagnosis of their newborn or get inappropriate information regarding their newborn health status.

3. METHODOLGY

Design:

This study was a Cross-sectional study (quantitative study) carried out in four districts of Haryana.

Setting:

Haryana is a north Indian state with population of 27.76 million (eighth populous state). It is one of the wealthiest states and has the third highest per capita income in the country. The state is divided into four divisions for administrative purpose: Ambala, Rohtak, Gurugram and Hisar. Within these, there are 22 districts, 62 sub-divisions, 83 tehsils, 47 sub-tehsils and 126 blocks. Common characteristics of population are given in following table:

For administrative purpose Haryana is divided into 4 divisions following are the common characteristics of population with 53.77 lakhs of male and 46.6 lakhs female population.

Population:

Sick newborn who were admitted in SNCUs during study period i.e. August 2017- September 2017 and 45 family members attending them in facility.

Sample size:

545 newborns were admitted in SNCUs in 3 months (August, September and october). 45 of beneficiaries (mothers and attendants) were interviewed to know about facilities available to them

satisfaction and all successfully discharged newborns were tracked through phone calls to see the outcome.

Sampling method:

4 districts were selected through convenience sampling out of total 21 Districts of Haryana 4 SNCUs which covers 1 9% of the total.

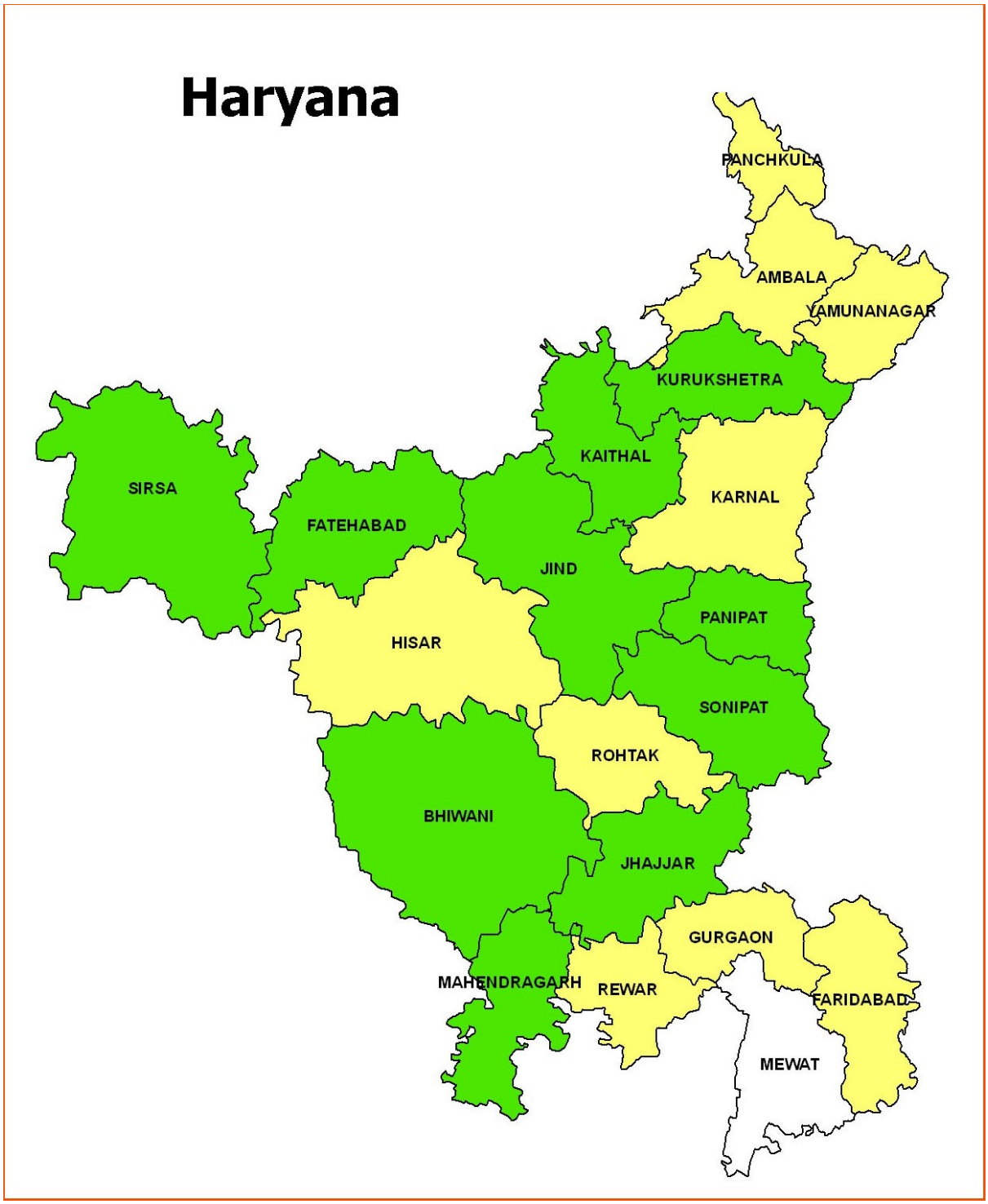

Figure 1: Map of Haryana showing study area

Participants

The study population comprised the neonates admitted in sick newborn care unit and their parents attending them. The study included those neonates who were admitted in the hospital between 1st august 2017 to 30th october 2017. Around 545 newborns were staying in the hospital between the dates the study was conducted. Structured interview of around 45 parents were conducted. , however, as pa rents /attendants were part of the study design, those parents were excluded those

were not willing to participate and staying in the city or not using facilities available in the facility because of some reason.

The study sample include 545 newborns admitted in SNCU and 45 parents or attendants with them and meeting the criteria below

1. Had a newborn admitted in SNCU
2. Over the age of 18 yrs
3. Not suffering from any psychiatric disorder.
4. Not staying in the city during study period.

Study carried out in following steps:

Table 4: Study plan

SNo.	Activity	Time duration
Step 1	Collection of data on selected indicators from online portal and hospital records	july 2017- september 2017
Step 2	Tracking of newborn discharge from SNCUs	august 2017- october 2017
Step 3	Structured interview of mothers or attendants of sick newborns admitted in SNCU	august 2017- october 2017

Step 1

Different indicators were selected from literature like admission criteria, infrastructure, equipments, human resource, hygiene and sanitation, duration of stay, morbidity profile, mortality profile, reason of discharge from SNCU.

1) Admission criteria in SNCU

Data for criteria of admission in SNCUs was extracted from online portal, hospital records and validate with discharge slip to observe the admission according to gender, social caste and type of admission and morbidity profile

2) Infrastructure

Data was extracted from hospital records and observations to know the bed availability, bed occupancy and facilities provided to mother of sick newborns like separate room for breast feeding and KMC with curtains and chairs, dummies for KMC so that counselor or ANM teach them the procedure properly.

3) Equipments

Data related to equipment was extracted from online portal and biomedical engineer records to check the availability and number of functional instrument and those required restoration. Calculate Down time of radiant warmer.

4) Human resource

Data related to human resource was extracted from online portal to find the number of doctors and nurses posted in SNCU, type of job they have, doctor to patient bed ratio, nurse to patient bed ratio and their training status.

5) Hygiene and sanitation

Hygiene and sanitation information was gathered through observations. The status of Hygiene & Sanitation was observed on 3 different days and crosschecked with the cleanliness checklist filled by hospital staff.

6) Duration of stay

Data related to duration of stay collected from online portal, which was crosschecked with discharge slip to find the type of cases referred from SNCU to NICU or higher care center. To find any discrimination based on caste.

7) Morbidity profile

Data was collected from online portal and validate using manual records and admission slips to find the pattern of morbidity in different districts.

8) Record maintenance

Patient entries in online portal were crosschecked with hospital record to find any missing entry or duplication of data.

9) Reason of discharge

To find the proportion of newborns that were successfully discharged from SNCU, died during treatment, leave against medical advice (LAMA) and referred to higher care center

Step 2

Tracking of newborn discharge from SNCU successfully

Tracking of around 545 newborns was completed through phone calls after successfully discharged from SNCU units. To find the status of newborn health and reminder calls received by beneficiaries to visit facility for first follow up. To find the reason of facility follow up drop out.

Step 3

Patient satisfaction

Structured exit interview of 44 mothers or attendants of sick newborns were conducted. Purpose of study was explained before carry out interview. Consent for participation in the study taken from each participant. Its principle was to know the facilities they were getting in the hospital and level of satisfaction towards these services. To find patient satisfaction a quality index was designed.

Quality Index

An index was created using 4 parameters namely:

1. Privacy
2. Cleanliness
3. Doctor Patient relationship
4. Staff Relationship

Under each head, several sub divisions were created. These subdivisions are as follows:

1. Privacy :
   In this researcher consider privacy given to the mother while feeding i.e. weather a separate room provided or not. Other factor that was entry of male in breast feeding room to cross check the response of mother and satisfaction of beneficiary regarding privacy.

2. Cleanliness:
   In this focus was hand washing before touching baby, access to clean toilets and bathrooms and level of satisfaction regarding cleanliness in ward where baby is was admitted.

3. Doctor patient relationship
   Aspects considered were understanding of instructions given by doctor, response given by doctor regarding their queries; clarify condition of baby and level of satisfaction regarding suggestions given by doctor.

4. Staff patient relationship

   It include factors like support provided by staff to the mother while feeding,

Likart scale was used which is divided into five categories. The scoring of scale was as follows:

1. Strongly agree
2. Agree
3. Uncertain
4. Disagree
5. Strongly disagree

Questions were designed in such a way that lower the number in response higher the satisfaction. The maximum frequency score was considered representing the response of each sub division. Now an average of these scores was taken which then represented response of beneficiary regarding each parameter.

Tools used

The tools used for this study were Standard operational guideline for SNCU adopted by NHM Haryana. Online data management software developed by UNICEF and NHM Madhya Pradesh and validation of this record with the help of manual hospital records available. Newborn tracking through phone calls to observe the outcome and reason behind facility follow up drop outs. Structured exit interviews for beneficiaries (mothers or attendants) to know their level of satisfaction regarding facilities available to them.

Ethical approval

Ethical approval obtained before commencement of project from Ethical Committee of IIHMR Delhi.

Administrative approval was taken from host organization NHM Haryana and discussed with deputy director child health, chief medical officers, nodal officers and SNCU in-charge of all four facilities before carry out the study.

Plan for analysis

Secondary data was collected from online portal and validation done with the help of hospital documents like discharge slip, OPD registers. Primary data collected through structured exit interviews of beneficiaries was arranged in excel sheets. Unique identification number was allotted to each respondent. First alphabet represent name of district followed by two digits. SPSS software was used for descriptive analysis. Satisfaction level of patient was calculated through quality index.

5. FINDINGS

The evaluation was carried out in four SNCU units across four districts of Haryana over a period of 3 months. For assessment, standard guidelines and protocols, which were adopted by NHM Haryana, were followed. Following indicators were considered in the functional assessment of SNCU units.

1. Admission criteria of SNCU units
1.1 Admission according to gender
1.2 Admission according to the morbidity profile
1.3 Admission according to social caste
1.4 Type of admission

2. Infrastructure provided
2.1 Bed availability
2.2 Bed occupancy rate
2.3 Facility for breastfeeding
2.4 Facility for KMC

3. Equipments availability
3.1 Availability of essential equipments
3.2 Adequacy of equipments

4. Human Resource available
4.1 Doctor : Patient
4.2 Nurse : Patient
4.3 Counsellor
4.4 Type of position -permanent, contractual, vacant, in-position
4.5 Training of FBNC, NSSK, Observership in regional centres

5. Duration of Stay

6. Type of discharge from SNCU units

7. Mortality profile of sick newborns admitted in SNCU unit

8. Record maintenance

9. Hygiene and sanitation

10. Facilities available to the beneficiary and their level of satisfaction

11. Outcome of those newborns that were discharged from SNCU unit successfully

1. Admission criteria of SNCU units

During the study period of 3 months, i.e. August,september and October total 545 newborns were admitted in the SNCU units of all four districts.

1.1 Admission according to gender

Among the total 545 admissions number of male and female newborns were 321(59%) and 224 (41%) respectively (fig 2). Male admissions were more as compared to females in all districts. In Sirsa and Rewari number of males was almost double of females.

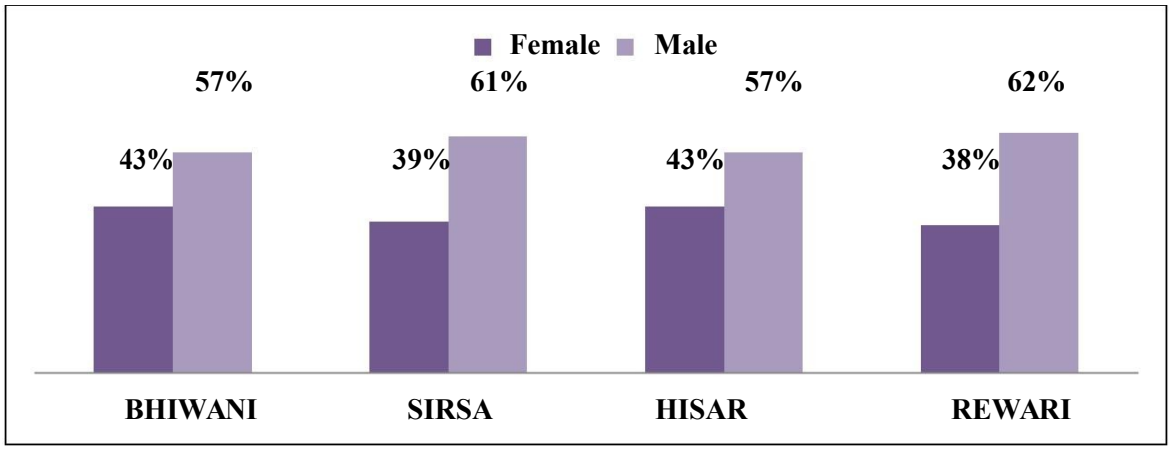

Figure 2: Admission in SNCU according to gender of admitted newborns

1.2 Admission according morbidity profile

Major cause of admission were neonatal jaundice (35%) followed by neonatal sepsis (30%), RDS of newborn (16%), birth asphyxia (10%) and LBW (8%) among total admitted newborns (fig: 3). While newborns suffering from hypothermia, acquired pneumonia, any other diagnosis, convulsions of newborn, meningitis were less than 1%. Cases of neonatal jaundice were higher in HISAR 62% of total admissions, whereas in SIRSA cases of neonatal sepsis were high i.e. 49% (fig:4).

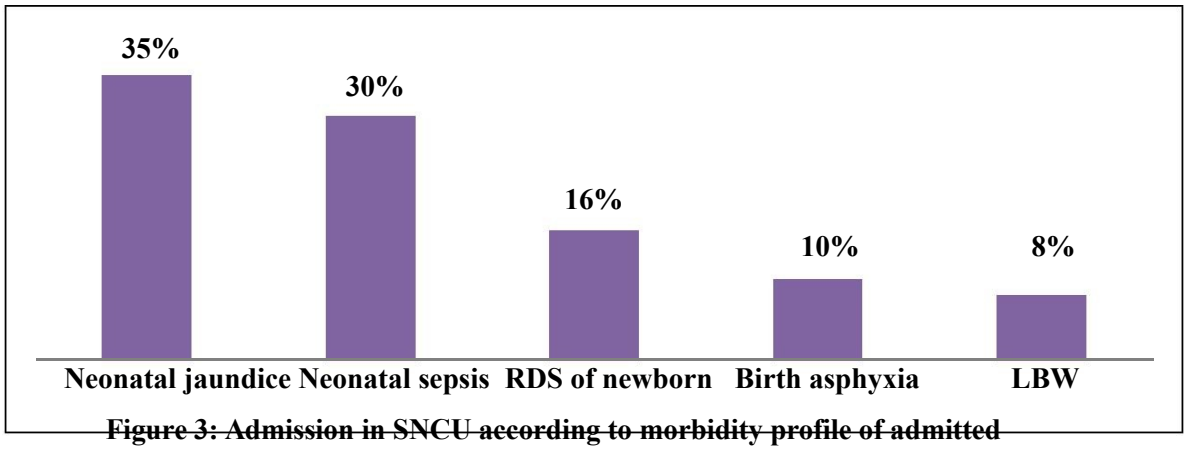

Figure 3: Admission in SNCU according to morbidity profile of admitted newborns

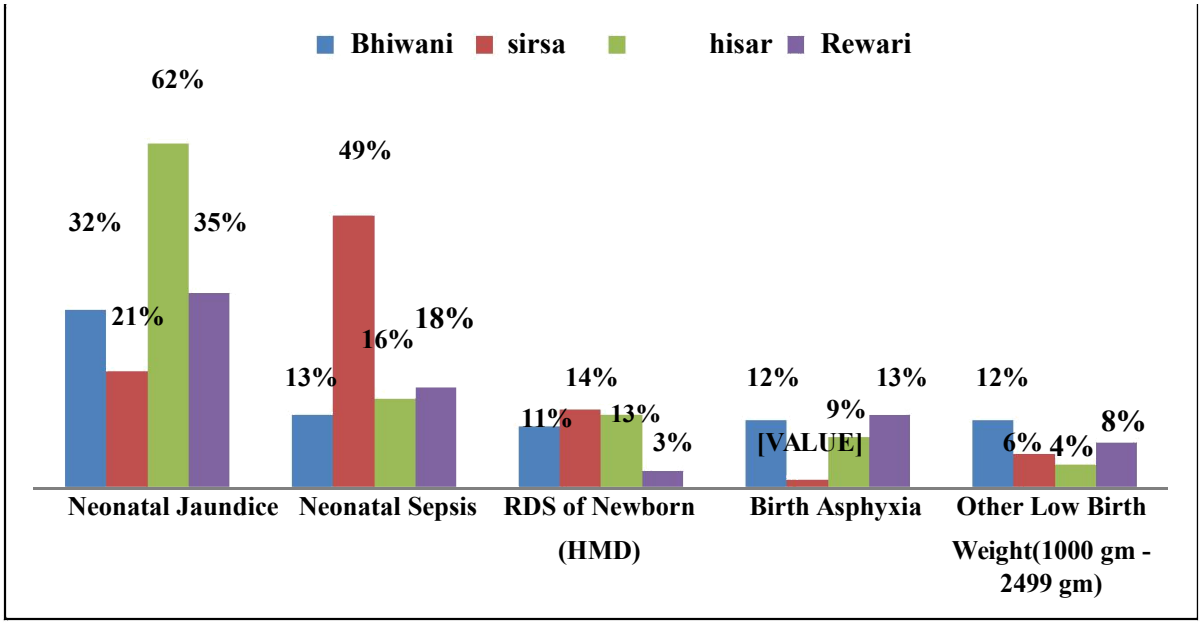

Figure 4: District wise morbidity profile of admitted newborns

1.3 Admission according to category caste

As observed from data available that 55 % newborns admitted to SNCU units were belonging to general caste and rest 45% admitted newborn were from other caste categories (OBC, SC, ST) (table: 5). Highest number of admission from general category i.e. 98% were found in Hisar district whereas highest number of admision of other caste were found in Rewari district i.e. 71%. In Bhiwani and Sirsa district admission of other caste were more than general category (fig: 5).

Table 5: Admission in SNCU according to category caste of admitted newborns

SNo.	Caste	Bhiwani	Sirsa	Rewari	Hisar	Total	%
1	GEN	65 (46%)	42(36.8%)	36 (27.6%)	157 (98%)	300	55
2	OBC	47 (33%)	30 (26.3%)	49 (37.6%)	2 (1.2%)	128	23.4
3	SC	29 (20.5%)	30 (26.3%)	45 (34.6%)	1 (0.6%)	105	19.2
4	ST	0 (0)	12 (10.5%)	0 (0)	0 (0)	12	2.2
5	Total	141	114	130	160	545	-

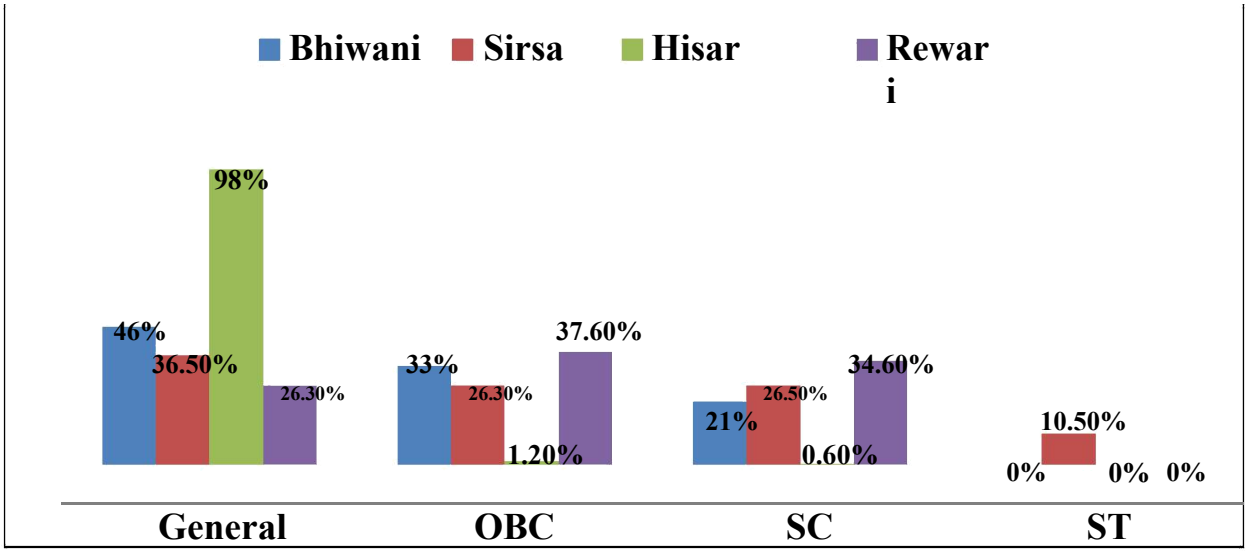

Figure:5. Admission according to caste

1.4 Type of admission

Those newborns who were born in district hospitals were considered as inborn while those who were referred from other goverenment facilities were counted under outreach community facility referred and other than these such as referred from private clinic or home delivery were considered as other health facilities. The number of newborns who were born in district hospital and shifted to the SNCU unit were more than those who were referred from an outreach community facility or other health facility (fig:6). Approximately 53 % inborn newborns were shifted to SNCU unit because of several reasons, whereas sick newborns who were referred from other health facility and community were 16% and 31% respectively.

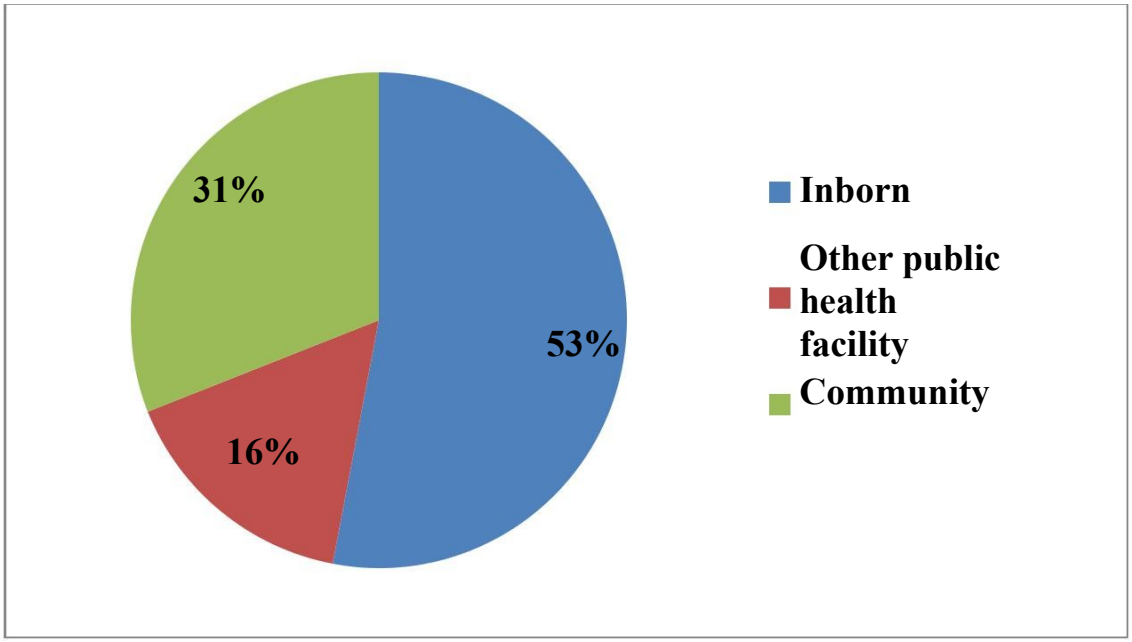

Figure 6: Admission in SNCU according to type of admission

2. Infrastructure provided

2.1 Bed availability

Bed availability is a crucial factor, which is decided according to the number of deliveries performed in the district hospital. The minimum number of beds for a SNCU at district hospital is 12 if district hospital conducts more than 3000 deliveries per year, 4 beds should be added for each 1000 additional deliveries. In selected district hospitals, around 3000 deliveries were conducted every year except sirsa, where around 2500 deliveries were conducted, and hisar conducted maximum number of deliveries among all facilities (around 4000 per year).

As recommended by NHM operational guidelines, 12 beds should be provided in the district hospital. Bhiwani and Rewari contain 18 beds each, while hisar contains 25 beds and sirsa had the least number of beds i.e. 8 according to delivery load.

2.2 Bed occupancy rate

It indicates the number of hospital beds occupied by patients expressed as a percentage of the total beds available in the ward. According to NHM bed occupancy rate is calculated by following formula:

{(Total admission in SNCU in the period/no. of days in the period)* Average duration of stay-in days}/Number of beds in SNCU]*100

Bed occupancy rate ranged from 56% in sirsa to 77% in hisar.

2.3 Facility for breastfeeding

All four facilities providing separate rooms for breastfeeding, but the dimensions varied. The breastfeeding room of Rewari provided only one chair and there was no room for a bed. Other three districts provide 3-6 bedded room with curtains to provide privacy while mothers feeding their babies. Every facility was equipped with refrigerator for storage of expressed milk and hot plate in case required.

2.4 Facility for KMC

All facilities except hisar were deficient of separate room for KMC with chairs for mothers. KMC room was under construction in Bhiwani . Lack of dummies to teach mothers about KMC and proper attachment during feeding.

3. Equipments availability

A checklist of essential equipment was derived from the NHM operational guideline for SNCUs. There were other instruments also available which were not included in the checklist like flux meter, formalin vaporizer, T-Piece Resuscitator, Bubble C-PAP and Flow Meter etc. which was additional advantage for all facilities.

3.1 Availability of essential equipments

The online portal contains detailed availability of instruments in the facilities, which contains number of instruments recommended by NHM operational guidelines and instrument available in the facility in functional form. The list was not updated regularly and non-functional instruments were not mentioned clearly.

3.2 Adequacy of equipments

Each facility contained an adequate number of instruments according to records that were available, however, there were no standard formats available to calculate the duration required to repair an instrument. Similarly, information was not available regarding calibration and management of instruments installed in the SNCU units.

4. Human Resource available

In human resource area of interest were doctor and nurse ratio to patient's bed, presence of counselor, data operator, type of post and their training.

4.1 Doctor: Patient's bed

According to NHM guidelines recommended doctor to patient's bed ratio is 1:4, which is 1:3 in all districts except Rewari where it is 1:4.5(table: 6).

4.2 Nurse: Patient's bed

According to NHM guidelines nurse to patient bed ratio has to be 1:1.2 and it ranges from 1:1.1 to 1:2.5 in all four districts (table: 6).

Table 6: Doctor and nurse ratio to the patient's bed in all four SNCU units

SNo.	District	Doctor: patient's bed ratio	Nurse: patient's bed ratio
1	Bhiwani	1:3	1:1.6
2	sirsa	1:3	1:1.1
3	hisar	1:3	1:2.2
4	Rewari	1:4.5	1:2.5

4.3 Counselor

One counselor is posted in each SNCU unit to counsel mother and her family about breastfeeding, KMC, cord care and nutrition. Rewari and Sirsa had a male counselor while in Bhiwani and Hisar female counselor were posted

4.4 Type of position -permanent, contractual, vacant, in-position

Number of doctors posted in SNCU unit were more than sanctioned post(table: 7), whereas number of nurses and other staff like counselors and data operators were according to post sanctioned for the unit. More than 60% doctors are working on contractual basis while all nurses and other staff, including counselors, DEOs , guards and sweepers all were working on temporary basis

4.5 Training of FBNC, NSSK, Observership in regional centre

Among all doctors posted in SNCUs 20% doctors were trained in FBNC, NSSK and Observership in regional centres (table: 7) while almost 80% nurses were trained (table: 8). More than 60% doctors were working in the SNCU units for more than 2 years, but they have never undergone any type of training.

Table 7: Type of position and training of doctors in all four SNCU units

SNo.	Districts	Total no. of doctors posted	Contractual	Permanent	NSSK trained	FBNC trained	Regional Observership
1	Bhiwani	6	4	2	2	1	0
2	Sirsa	6	*	*	2	1	1
3	Hisar	8	5	3	2	2	2
4	Rewari	4	3	1	1	1	1

(* data not available)

Table 8: Training of nurses in all four SNCU units

SNo.	Districts	Total no. of nurses posted	NSSK trained	FBNC trained	Regional Observership
1	Bhiwani	10	9	10	7
2	Sirsa	7	2	6	2
3	Hisar	10	7	9	6
4	Rewari	8	8	8	8

5. Duration of Stay

Average duration of stay was different for each unit. It was less in Sirsa (2.4 days) and in Rewari (3.4 days) while higher in Hisar and Bhiwani (6.8) (6.3) respectively (fig: 7). Major reason that increased the duration of stay were LBW, prematurity, IUGR, sepsis and neonatal jaundice.

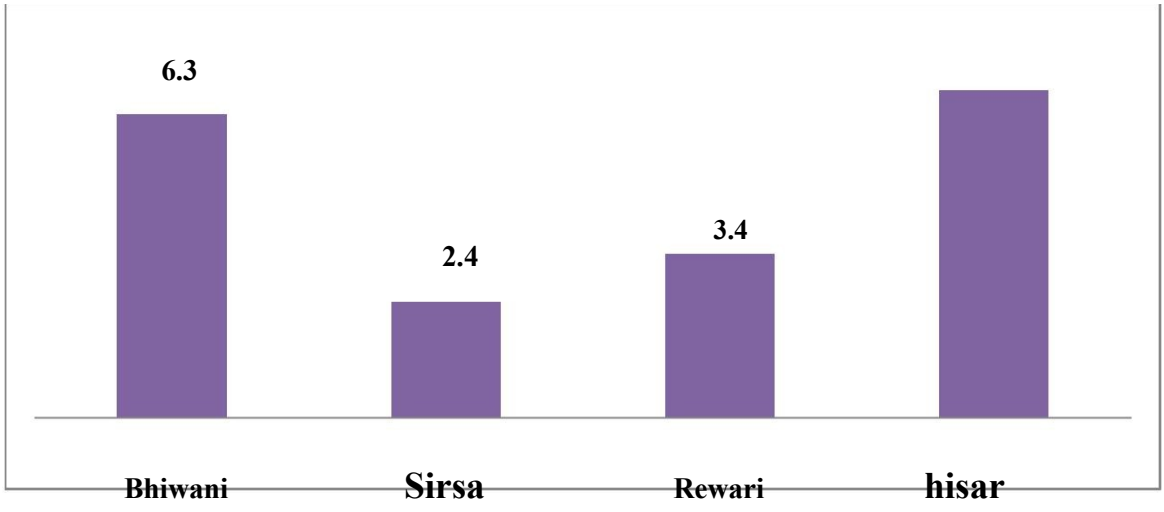

Figure 7: Average duration of stay of newborn in SNCU unit (in days)

6. Type of discharge from SNCU units

Discharge from SNCU unit can be a successful discharge, referred to higher facility, LAMA and death of the newborn. Highest percentage of discharge was found in Hisar (91%) followed by Bhiwani (86%), Sirsa(78%) and Rewari (71%). Number of referred cases and LAMA were higher in Rewari 17.6% and 10.7% respectively while least referred cases were found in Bhiwani (11%) and hisar (6%) (fig: 8). Only two babies could not able to survive in hisar and Bhiwani district each.

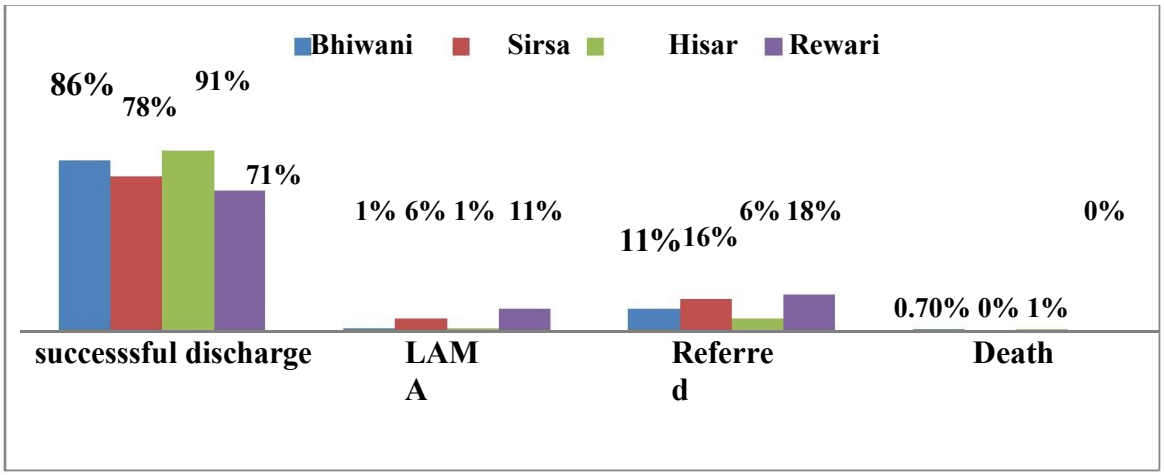

Figure 8: Type of discharge in different districts

7. Mortality profile of sick newborns admitted to SNCU unit

Two newborn could not survive in Hisar and Bhiwani district each. One of them died because of neonatal sepsis while reason for another newborn was not explained.

8. Record maintenance

Maintenance of record was done both manually as well as on online portal (designed by NHM and UNICEF). Data from online portal was validated with manual records like OPD register, discharge slip. Duplication of entries was less than 1%. Entries on the portal were done on the same day as observed. Green coloured SNCU follow up discharge card was provided to the patient, which have information regarding facility and community follow-ups. Record related to repair and maintenance of equipment was not available. Standard format for equipment calibration, repair and for cleanliness were not formed.

9. Hygiene and sanitation

Parameters considered were adherence to hygiene protocols and cleanliness in SNCU. It was observed that cleanliness protocols were not followed by staff like hand washing, wearing of gowns and sterilized slippers while visiting SNCU. Cleaning of mattress of radiant warmer, facemask, oxygen hood was not performed daily. Mopping of the floor was done three times a day.

Tracking of newborns discharged from SNCU

A total of 545 newborns were admitted during study period of 2 months. They were tracked to know their health outcomes and status of first follow up after one week of discharge. It was found that contact number of 6 % beneficiaries were not available. Phone calls were never received by 36% beneficiaries (fig: 9), 38% beneficiaries informed that their babies were healthy after discharge, 19% newborns were unhealthy and seeking medical assistance while 1% newborns passed after reaching the community (fig: 10).

Around 45% prefer private facilities for treatment over public health facilities because of unavailability of resources like a bed or dissatisfied from quality of care (fig: 11). First, follow up visit was attended by 42 % newborns (fig: 12) of which 27% attended because they had some problem such as cold, diarrhoea and feeding problems (fig: 13). Less than 15 % were given lactogen on doctor's advice while around 2% started with cow milk to feed their babies.

A green coloured SNCU follow up card was generated from the facility in which dates for one year follow-up were mentioned. Among all beneficiaries, 73% got green coloured follow up card and out of this, 41% were unaware about follow up facility given in district hospital. It creates a reduction in further follow-ups, which ultimately affect the health of newborn and validation of data.

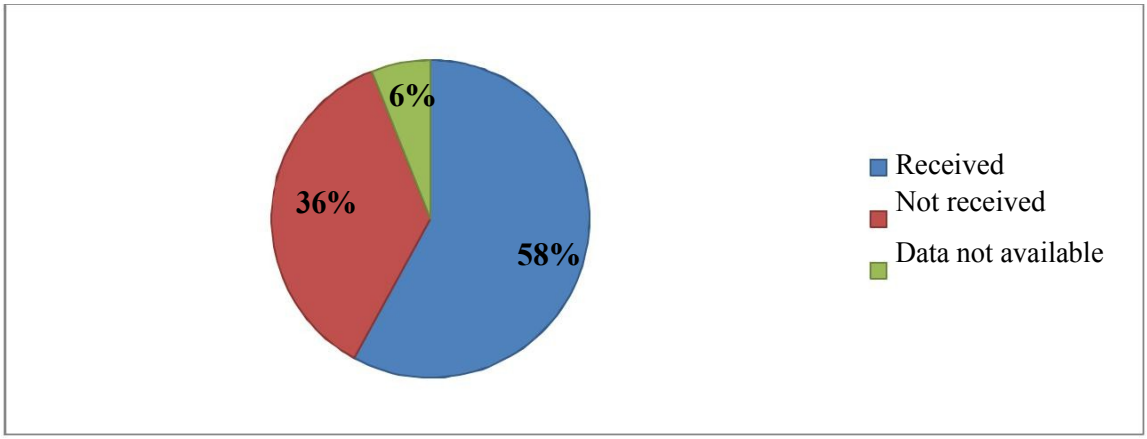

Figure 9: Call received by respondent

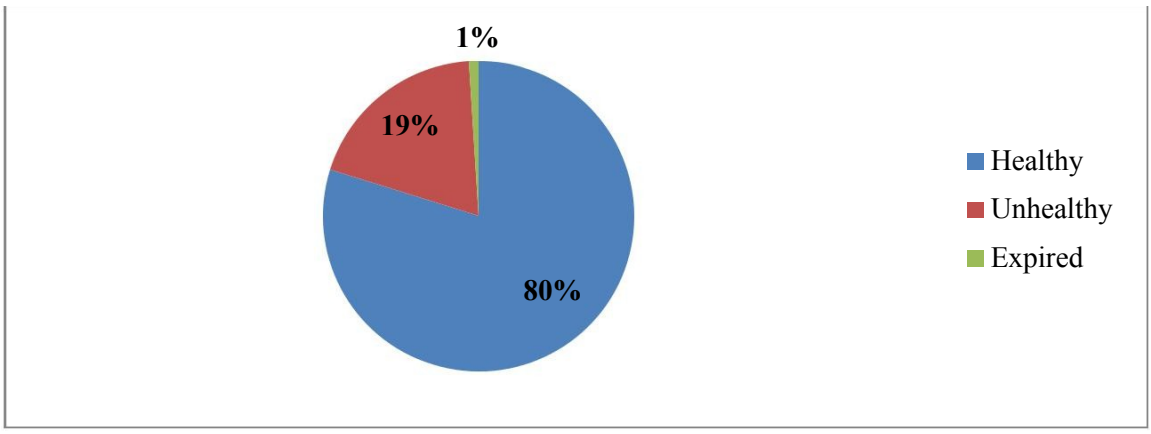

Figure 10: Health status of newborn after discharge from SNCU

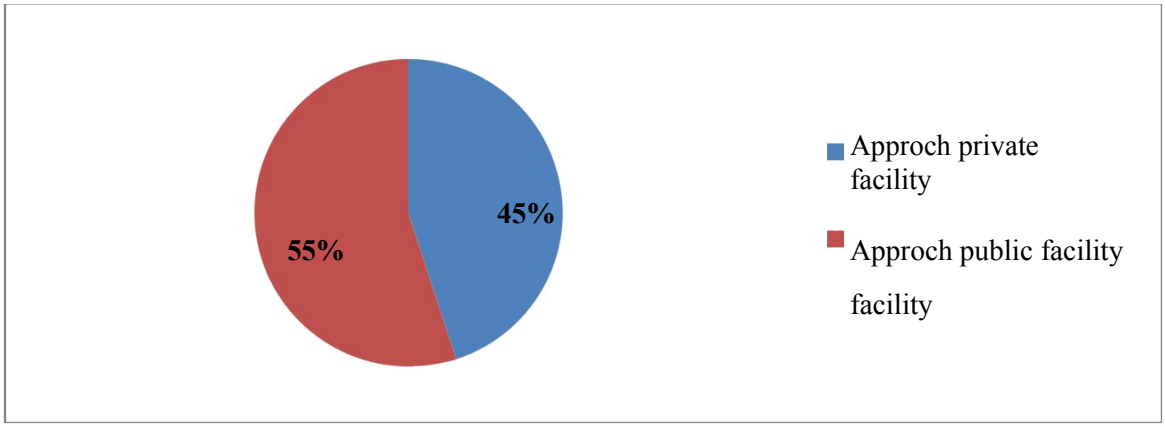

Figure 11: Approach to health facility after illness episode

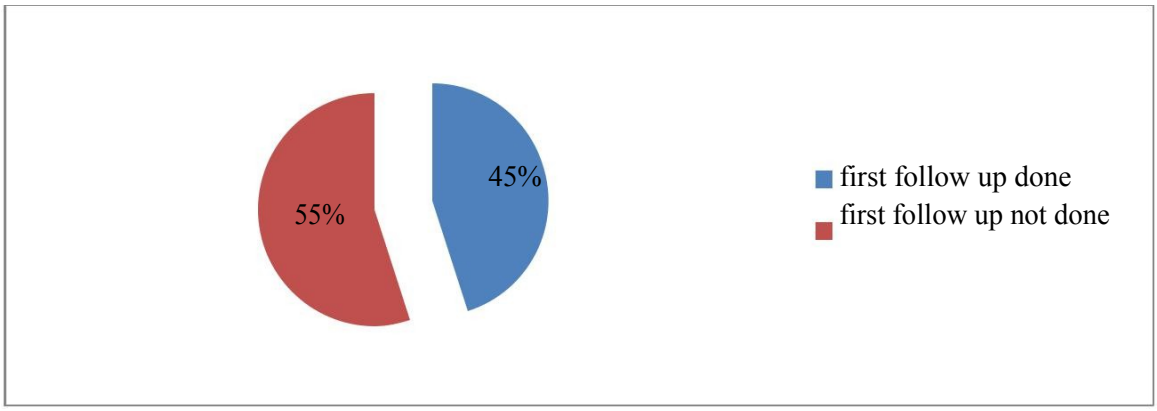

Figure 12: Percentage of people attended first facility follow-up

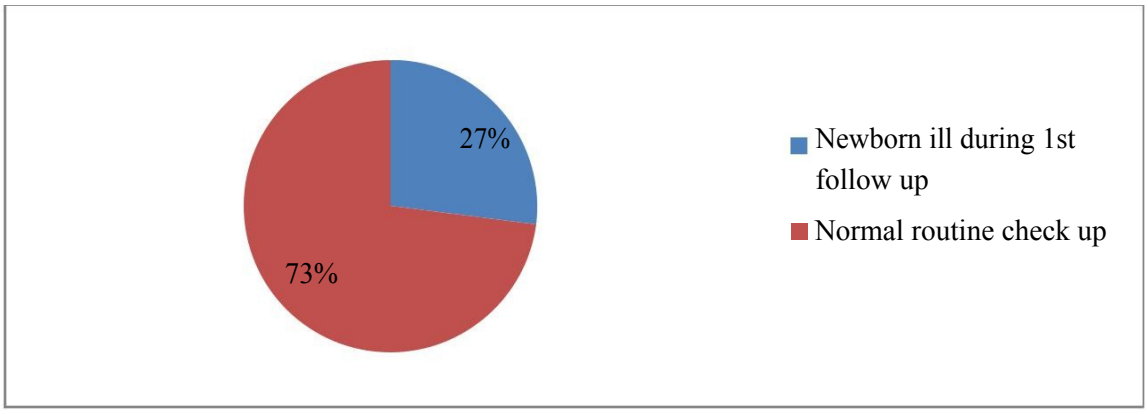

Figure 13: Health status of newborn during 1st facility follow up Facilities available to beneficiary

In facilities available to beneficiaries observed parameters were provision of privacy during breastfeeding, access to clean toilets and bathrooms, information given by counselor about newborn care. Almost half of beneficiaries never got a separate room for breastfeeding except Hisar. Two third beneficiaries able to access clean bathrooms and in Rewari mothers were not having bathrooms. None of them were getting warm water. Almost half among all

interviewed people were able to access clean toilets. Maximum knowledge were given about hand washing before touching baby followed by wrap the baby in clean cloth whereas, information like cleaning of utensils in boiled water before feeding was less and confined to only those who were giving external feed to their babies(fig: 14)

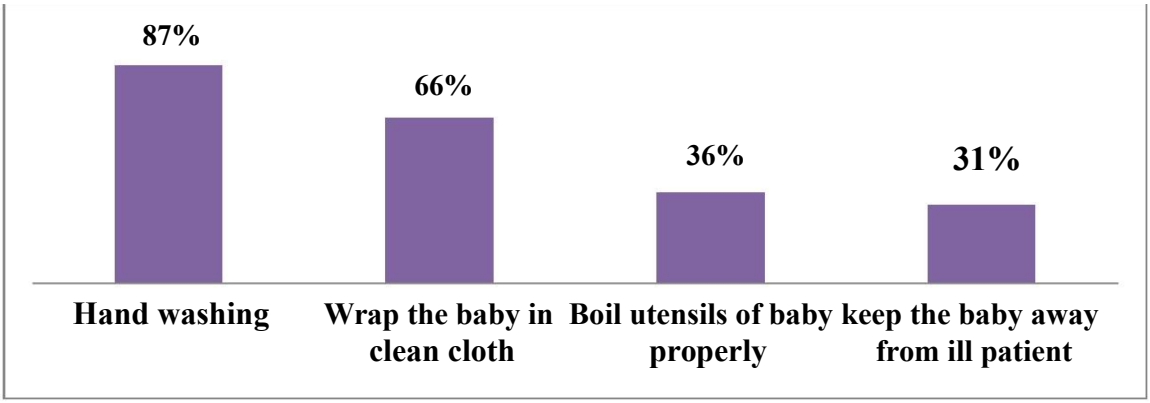

Figure 14: Information about hygiene and sanitation given by staff to

mother PATIENT SATISFACTION

To observe patient satisfaction four parameters were observed. These were privacy, cleanliness, doctor-patient relationship and staff-patient relationship. The outcome is discussed below:

1. Privacy

Highest satisfied patients were found in Hisar whereas Rewari has least number of beneficiaries who were satisfied with privacy provided to them during breastfeeding.

2. Cleanliness

Rewari have the highest number of patients who were unsatisfied because of cleanliness while other three districts hold the same level of satisfaction. Cleanliness in the ward was up to the mark, according to responses, but facility for hand washing and access to clean toilets was compromised.

3. Doctor – patient relationship

Level of satisfaction was lowest among Rewari patients towards doctors. Hisar has the highest number of satisfied patients while Bhiwani and Sirsa lie in-between them.

4. Staff patient relationship

Level of satisfaction of beneficiaries towards staff behaviour is not pleasing and Rewari scored highest for non-satisfaction whereas Hisar scored low which indicates the highest number of client satisfaction.

DISCUSSION

FACILITY ASSESSMENT

Admission criteria

The review of literature provides some insights about the conditions of facility based newborn care in India. Two third of total admitted newborns were males, in Sirsa and Rewari the number was almost double of admitted female newborns. In India, major causes of newborn admission in SNCU were sepsis, birth asphyxia and prematurity (SNCU Tool IPGMER, Kolkata) but in Haryana two third of admitted newborns were suffering from neonatal jaundice and sepsis whereas, cases of prematurity were very less. Admission of inborn patients was high due to inadequate working of NBCC which causes overload on SNCU units which results in avoidance of those who were in real need. In Haryana, almost half of total admitted newborns were inborn. Main reasons for such admissions were insufficient working of NBCC in the labour room, mother who was suffering from any complication during delivery and for observation.

Infrastructure provided

In this focus was given on bed availability, bed occupancy, breastfeeding room and KMC room. All SNCU units were full filling the criteria for different activities like breast feeding room, side lab, duty room for doctors and nurses, boiling and autoclaving

Bed availability was adequate according to guidelines, but it can be cost- effective if no. Of bed decided according to was according to morbidity profile and duration of stay of newborns in the facility instead of delivery load (Neogi, 2014).

In each facility, one separate room was provided to the mother to breastfeed their babies. Beds were available in the breastfeeding room except Rewari district, which results in transfer of baby in a ward with mother for feeding causes exposure of a newborn to the external environment.

None of the facility except Hisar have a separate room for KMC with chairs. Dummies for demo or any type of IEC material such as educational videos were not available in any facility to educate the mother, which can help in saving time of staff and it is feasible to repeat and understand by attendants.

Equipments availability

Information regarding equipments is available on online software, but the list about working status of instruments was not updated as well. It was very difficult to find the duration between lodgement of the complaint and repair done. No standard format or protocol was followed for periodic calibration of instruments like weighing machine; pedometer etc. Each facility has adequate number of essential instruments recommended in SNCU operational guidelines, which was an additional benefit.

Human Resource available

Parameter considered were doctor to patient's bed ratio, nurse to patient's bed ratio, their type of post and training. Numbers of doctors posted in SNCU units were more than post sanctioned for a particular unit while the number of nurses was as per norms. Facilities were deficient of human resource in SNCU units as mentioned in many studies, which was not an issue in Haryana. There was a lack of trained medical staff, according to adopted guidelines. One fifth of total doctors posted in SNCUs were trained while four fifth nurses were trained in FBNC however, there was no provision of evaluation. Less than one-fourth staff was permanent and remaining staff working on a contractual basis. Mostly Counsellor attended the facility follow up in supervision of doctors. They were trained to supervise "Yashoda" and breastfeeding; however, there is a need for capacity building mainly for male counselor. The issues were mostly related to behaviour of staff and limited access to doctors. That resulted in reduced levels of satisfaction among beneficiaries.

Duration of Stay

Average duration of stay in days was higher in Bhiwani and Hisar.. Duration of stay was high for those newborns that were diagnosed as LBW, prematurity, IUGR, sepsis and neonatal jaundice.

Type of discharge from SNCU units

Maximum numbers of admitted newborns were successfully discharged from SNCUs. Newborns referred to higher facilities were those who needed ventilation and surgical intervention. Cases of neonatal mortality during admission were negligible.

Record maintenance

The patient record is maintained in both ways, manual as well as in online software and updated regularly, whereas, documentation related to equipment, there maintenance and repair was not updated properly. Absence of record related to instrument calibration and other details like, procurement and contract details, repair makes it difficult to find down time and working life of any machine. Provision of green card at the time of discharge was not followed properly or if provided many of they were not aware about follow-ups, which ultimately results in failure to attend the facility, follow-ups.

Hygiene and sanitation

We see that the housekeeping protocols should be followed to reduce proliferation of microbes. Hygiene and sanitation protocol like hand washing, wearing of gown during SNCU visit was not followed, which can cause newborns to become more susceptible to nosocomial infections (Prabhakar P, et al, 2016) There was an absence of a visitor policy that allow timely management of visitors.

TRACKING OF NEWBORNS

Lack of tracking of newborns after discharge and facility follow up was not done in SNCU units (Neogi SB), whereas in Haryana tracking of the newborn was done till the first year of life through five facility follow- up but the dropout rate is very high. There is a reduction in facility follow up because of less awareness about its benefits among people.

Approximately two-third newborns were tracked rest were not acknowledged because lack of contact details, phone number was not mentioned and beneficiaries were not willing to attend calls. $1/5^{th}$ newborns were unhealthy after successful discharge from SNCU units. Almost half of them were re-treated in government facilities while the other approached to private because of less satisfaction towards facilities available in public hospitals. First facility follow up was attended by less than half newborns because of following reasons:

- The patient does not have a green card for follow up dates.
- The patient does not receive reminder calls from the facility.
- Beneficiary thinks their baby was healthy.
- Distance of district hospital from home was more so missed it.
- Cultural factors like mother went to paternal home or delivery performed in paternal city and after that, she moved to her in-laws, which make it difficult to track those newborns.

FACILITIES AVAILABLE TO PATIENT AND THEIR SATISFACTION LEVEL

Level of satisfaction was highest among those attendants of newborns admitted in hisar because leadership quality of SNCU in-charge who monitor and regulate all protocols properly. Major problems were the unavailability of wheelchairs for mothers while moving from ward to SNCU. The staff locked toilets in the night, which create a nuisance.

In district Rewari, there were trust issues between staff and beneficiaries. According to respondent staff rarely called them to feed their babies and never inform them about the condition of newborn. Contact with the doctor was also limited. Male counselors were not able to counsel mother and her family properly. Room provided for breastfeeding were very small and the level of privacy was unsatisfactory which causes difficulty to mother while feeding. Access to clean toilets and absence of bathrooms for bathing were major issues.

In sirsa district, the main issues were behavior of staff. Attendants of newborns were not informed about the condition of newborns and contact with doctors was limited.

In Bhiwani, rising issues were lack of space for hand washing, lack of proper counselling i.e. mothers were counseled for breastfeeding, but other parameters like hygiene and sanitation, KMC were not focused.

Figure 15 **Figure: 16**

Figure 15: Mother and her relative sitting in breast feeding room in Rewari district
Figure 16: A male standing outside breast feeding room in Rewari district

The overall patient satisfaction score was satisfactory. Major issues were lack of access to toilets and bathrooms, unavailability of facility of hand washing, the unconvincing behavior of staff. Beneficiaries were highly satisfied with cleanliness in their wards.

Suggested recommendations

Periodic reminder to beneficiary for follow-up needs to be improved and completed till the child becomes one year old. Lac k of response to the phone calls by beneficiaries was because of contact details saved in onli ne portal belongs to their relatives which cause inadequate transfer of information or father live s at different place. Placement of LED for mother education about newborn care in breastfeeding or KMC room to educate them. Provision of dummies should be there for educational demostration given by the counselor. There is a need of training for counselors which can help in their capa city building especially male counselors. It also reduces work load of nurses through task shifting. Partnership with NGOs to provide technical support in improving quality of care. If facility starts taking feedback from the beneficiary, it will help in improving services and ultimately the level of client satisfaction.

Limitations of research

The sample size of the beneficiary for structured interviews to know the lev el of satisfaction was inadequate. It was not possible to know the exact reasons for admission in S NCU.

Conclusion

Two third admitted newborns were suffering from neonatal jaundice and sepsis. Facility for breast-feeding and KMC were not adequate. There was a lack of data about instrument management. Human resource available in sufficient number but lack of training was an issue. Hygiene and sanitation protocol were not followed properly. There was a need of awareness regarding facility follow up to reduce dropouts. Overall, patient satisfaction score was less for hygiene and sanitation and behaviour of staff. There is a scope of improvement for proper functioning of sick newborn care units.

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ANNXURE

Informed consent form

S. No…..

Confidential-For research purpose only

Dr.Saroj Mann

PGDHM
IIHMR
DELHI

Good Morning Ma'am/sir, I am Saroj Mann. I am a student of PGDHM at International Institute of Hospital and Health Management. I am here to seek your cooperation for this study that aims to assess the Sick newborn care unit in this district . I would like to know about your perspectives

Your participation is very valuable in completing the study. However, your decision to participate is voluntary. If you do agree to take part, I would assure you that your name and identities will not be included anywhere in my study and in the information shared by you would be kept confidential. It would be only used for my study work. During the discussion, you will have the right to refuse to answer any question or to withdraw from the study at any point in time, should you wish to. However, I hope you will choose to participate in the study.

The participation in the study would mean spending about 15-20 minutes to give an interview.

Please feel free to ask me anything that you may want to know or you can call on the number given below to ask any query after participation.

In case of any other queries or clarifications, you may contact me on the following number:

Name- ……. Ph. No. …….....

If you have agreed to take part in the study, kindly sign the consent form to indicate so. Thank you.

Date- signature of participant

Date and signature of interviewer

(phone no.)

INTERVEIW OF FAMILY MEMBER / MOTHER OF SICK NEWBORN ADMITTED IN SNCU

Identification no. of participant: ……..

City: ……. Town: …….village: ……..... caste: ……

Date of interview: …….. Monthly income/ per annum - ……

Relation of respondent with sick baby: ……

Active phone no. : …….

Date of birth: ……. Age of baby (in hrs/days): ……

Gender of baby: …….. Problem with baby ……

Weight of baby at the time of birth: ……

Delivery place: Home delivery / Public facility /Private facility

Delivery mode: Normal / C-section / Forcep delivery

Referred: yes/ no (in patient / Outpatient)

Re-admission: yes/ no if yes, time duration between first and re-admission:

How many times mother breast feed the sick baby: ……..

¤¤ FACILITIES AVAILABLE:

A. PRIVACY:

Do you Know	Response
Are you provided with a separate room to breastfeed your baby?	Yes / no
Are the doors and windows of the room covered with a curtain?	Yes / no
While you breastfeed your child who all are allowed access in the room?	Yes / no
Is any male member of your family present in the room?	Yes / no
Are any other male members present in the room while you breastfeed?	Yes /no
Does any man enter in the room without permission of staff?	Yes /no
Does the hospital staff shout at you while giving instructions?	Yes/ no

B. EXPENDITURE ON DRUGS:

S.No.	Questions	Response
B1	Are the medicines prescribed by the doctor available at medical store of hospital?	a) All medicines are available
		b) Some are available
		c) None are available
B2	What is the amount of money that you have spent on the drugs after the child was admitted in SNCU?	a) <500
		b) 501-1000
		c) 1001-1500
		d) 1501-2000
		e) 2001-2500
		f) 2501-2600
		g) 2601-3000
		h) >3000
B3	Why you had to buy drugs from outside?	a) Not available at store
		b) Staff Not available at store
		c) Others
B4	Have you ever brought consumables like diapers, leads from outside?	a) Yes
		b) No

C. CLEANLINESS:

S.No.	Questions	Response
C1	Is your ward cleaned by hospital staff on regular basis?	Yes/No
C2	How many times a day was the ward cleaned?	
C3	Were you provided with adequate blanket and bed sheets by the hospital authorities?	Yes/No
C4	If yes, how frequently were they changed?	
C5	Are you being provided with access to clean toilets?	Yes/No
C6	Are you given access to clean bathrooms?	Yes/No
C7	Do you get warm water for bathing in winters?	Yes/No
C8	Is there anything in ward to maintain room temperature?	a) Room Heater
		b) Air Cooler
		c) AC
		d) Fan

D. TRANSPORTATION FACILITIES:

S.No.	Questions	Response
D1	Are you aware about the transport facility available to sick newborn?	Yes/No
D2	Did you use the transport facility to bring your child in this hospital?	Yes/No
D3	Were you charged money for using the transport facility?	Yes/No

E. INFORMATION GIVEN BY HOSPITAL:

Breast Feeding		
S.No.	**Do you Know**	**Response**
1	Position of mother	Yes/No
2	Proper attachment	Yes/No
3	How many times you should breastfeed the baby in 24 hours?	Day……../Night……..
4	How to hold baby after breastfeeding?	Yes/No
5	Method of expressing breast milk	Yes/No
6	Preparation of supplementary food	Yes/No
7	How to feed from katori-spoon feeding	Yes/No
8	What was the first feed given to your baby?	a) Mother's Milk
		b) Others
9	Do you feel breastfeeding is good for you?	Yes/No
9a	If yes how?	
10	What all things are you giving to your baby for feeding?	
11	Do you know till what time you should give only breast milk to your baby?	
KMC		
S.No.	**Information Given**	**Response**
1	Method of KMC	Right / Wrong
2	Duration of KMC	
3	Who all can give KMC to baby?	
Hygiene & Sanitation		
S.No.	**Information Given**	**Response (Yes/No)**
1	Washing hand before touching baby	
2	Clean and boil the utensils before feeding	
3	Wrap baby in clean and dry cloth	
4	Keep the baby away from ill people	

LIKERT SCALE FOR PATEINT SATISFACTION

Doctor-patient relationship						
S.No.	**Statement**	**Strongly Agree**	**Agree**	**Uncertain**	**Disagree**	**Strongly Disagree**
1	I can easily understand the instructions given by doctor					
2	Doctor always listen what I said					
3	Doctor always explain condition of my baby					
4	I am satisfied what doctor suggested					
Staff-patient relationship						
S.No.	**Statement**	**Strongly Agree**	**Agree**	**Uncertain**	**Disagree**	**Strongly Disagree**
1	Staff provide support during feeding					
2	I can easily understand their instructions					
3	I always obey their instructions					
4	Staff explains procedures every time before performing on my baby					
Cleanliness						
S.No.	**Statement**	**Strongly Agree**	**Agree**	**Uncertain**	**Disagree**	**Strongly Disagree**
1	I always wash hand before touching baby					
2	Toilets and bathrooms are neat and clean					
3	I am satisfied with the cleanliness in my ward where I am admitted					
Privacy						
S.No.	**Statement**	**Strongly Agree**	**Agree**	**Uncertain**	**Disagree**	**Strongly Disagree**
1	I get enough privacy while feeding my baby					
2	Male can enter in room frequently while feeding					
3	I am satisfied with the services getting in this hospital					