

Original Research Article

Inpatient care of sick newborns in special new born care units in Odisha

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ABSTRACT

Background: Inpatient care assessment of sick newborns in Special New Born Care Units (SNCUs) in Odisha is vital for feedback and improvement. This study aimed to characterize the quality of care provided by SNCUs in selected districts in Odisha during 2020-2022.

Methods: Using secondary data from 10 SNCUs of District Hospitals in Odisha over a three-year period (2020–2022), we performed a cross-sectional descriptive analysis on all admitted neonates. Age, gender, birth weight, admission indication, maturity, mortality profile, referral, and admission pattern were all profiled. Excel 2021 was used to extract the data, and Excel and Epi Info were used for analysis.

Results: Of the 50226 babies admitted to SNCUs, 24383 (48.5%) were inborn. Males made- up 58.4% of the infants. 995 babies (2.0%) weighed less than 1000 grams, while 58.5% of neonates had low birth weights (less than 2500 grams). Prematurity (n=4363, 8.7%), low birth weight (n=6757, 13.5%), refusal to feed (n=5327, 10.6%), neonatal jaundice (n=9616, 19.1%), and perinatal asphyxia (n=14421) account for 28.7% of hospitalizations. Of the total, 4.1% left the SNCU against medical advice, 9.7% died, 11.3% were referred, and 74.8% were discharged. The leading causes of death were preterm birth, infection, hypoxic-ischemic-encephalopathy (HIE), and birth asphyxia. The Composite SQCI performs satisfactorily (0.60-0.66) over the course of the twelve quarters

Conclusion: Birth asphyxia is the primary cause of illness and mortality in neonates. Early referrals, effective intervention, and excellent prenatal care are essential to prevent it.

Keywords: Special new born care units, Birth asphyxia, Neonate, Low birth weight

INTRODUCTION

District and sub-district hospitals built special newborn care units (SNCUs) to treat small and sick newborns, including all forms of newborn care except for assisted ventilation and major surgeries, due to the yearly delivery load exceeding 3000. A unique institution with 12 or more beds is called a special newborn care unit (SNCU). Staff nurses, physicians, and support staff who have received the required training to offer services around-the-clock operate it, which is adjacent to the labor room. These units contain admission and discharge

requirements to guarantee optimal service use, bed strength, and services.^{1,2}

Special newborn care units (SNCUs) have increased dramatically across the country. The use of facility-based Newborn Care (FBNC) has grown significantly in India's healthcare system during the last ten years. The NICU is situated at the tertiary level (level 3 of the Indian health system hierarchy), while the SNCU is designed for Level 2 facilities-district or civil hospitals-that do not provide pediatric surgery or ventilation. Despite advances in infrastructure, over a million infants are admitted each year to the 894 SNCUs established in district and state

hospitals.³ The services provided at each level depend heavily on the institutional capacity, referral routes, skilled labor supply, and infrastructure. The case fatality rate for neonates admitted to hospitals has decreased as a result of SNCUs. Human resources and infrastructure continue to confront difficulties. Hospitals provide specialized or intensive neonatal care to more than 30 million newborns every year. These newborns can lead healthy lives if they receive high-quality inpatient care at the right time and place, including family-centered care and follow-up care.⁴

Assessments of SNCUs' performance in terms of care quality, organization, and procedure should be conducted in order to encourage improvements and raise accountability.^{5,6} In 75 high-burden countries, reducing the quality gap is estimated to prevent 1325 million neonatal deaths, 5,31,000 stillbirths, and 113,000 maternal deaths yearly.⁷ High-quality inpatient treatment can save Millions of inpatient newborns.⁸

A review estimates that failure to improve birth outcomes will lead to 116 million deaths.⁹ However, in resource-constrained environments, the health system often encounters bottlenecks, such as a shortage of medical staff, equipment, and knowledge of how to care for small, ill infants.^{10,11} System and procedure quality enhancement through the regularization of health program data is urgently needed to meet patient and program requirements.¹²

Measurement of the quality of healthcare services in SNCUs is necessary for feedback and improvement. Only 53% of neonatal units have the required number of doctors, and less than half have the required number of nurses, indicating a serious shortage of human resources.¹³ At the point of care, compliance varies despite the availability of evidence-based guidelines.¹⁴

With assistance from UNICEF, the Government of India launched "SNCU online," a web-based data administration and tracking system, at each SNCU in 2011. This initiative is still being implemented at all SNCUs in India and Odisha. When so many infants are admitted and treated, a huge quantity of data is generated, including demographic information, vital and anthropometric statistics, admission requirements, treatment profiles, outcome status, bed occupancy, and more.

In order to improve the quality of care at SNCUs, the data is routinely added to the SNCU web program. The SNCU quality of care index (SQCI), a simple, focused, and concentrated Microsoft Excel-based tool, was created to solve the challenges of efficiently utilizing the data to enhance treatment quality.

To address the challenges of properly using the data to improve quality of care, a committee of national child health specialists created the SNCU quality of care index

(SQCI) using the pool of SNCU data. In 2016, the national government proposed expanding its use. There are currently 44 SNCUs in Odisha State, and web-based data administration is being used at every unit.

Study objective

Using the seven quality of care indices, the study aimed to characterize the quality of care provided by SNCUs in selected districts in Odisha, during 2020–2022.

METHODS

We used information from the SNCU online database (<https://sncuindiaonline.org>) to do a cross-sectional descriptive analysis on all newborns who were treated at SNCUs in ten aspirational districts of Odisha during the three calendar years 2020–2022. The profile of hospitalized neonates and their results were among the data collected. Seven indices were used to calculate the SNCU Quality of Care Index (SQCI), and the SNCUs' performance was evaluated in accordance with the results. SQCI was computed as scores, and the main conclusions were summed together as proportions. We analyzed the data using Microsoft Excel (2021). Necessary permission for the study and ethical clearance was obtained from the Dept. of Health & Family Welfare Govt. of Odisha.

Study setting

Special Newborn Care Units situated at the District Hospitals of 10 Aspirational Districts of Odisha — Nuapada, Rayagada, Nabarangpur, Kandhamal, Kalahandi, Malkangiri, Balangir, Dhenkanal, Koraput, and Gajapati.

Inclusion criteria

All newborns admitted in the 10 SNCUs from January 2020 to December 2022 are included in the Study.

Exclusion criteria

All newborns admitted in the 10 SNCUs from January 2020 to December 2022 are included in the Study, so there is no exclusion.

RESULTS

SQCI (special new born care unit quality of care index)

The GOI advises using the Special New Born Care Unit Quality of Care Index (SQCI) as a decision-making tool to generate seven different indices on significant variables for analyzing clinical practice gaps, mortality outcomes, and the best use of services in SNCUs.¹⁴ It accomplishes this by utilizing SNCU web data that is currently accessible. Using precise measures for evaluating the level of care, a team of national experts in

neonatal and pediatric health developed the instrument. Indicators of optimal service utilization include bed occupancy, avoiding unnecessary admissions, and admitting small infants. Admissions of inborn children with birth asphyxia (which indirectly suggests a lack of resuscitation abilities) and the utilization of antibiotics can be used to measure the adequacy of clinical practices.

Table 1 shows the SNCU quality of care index (SQCI) calculation. Table 2 shows the purpose of the SQCI indices and performance grading. The Table 3 shows the profile of neonates admitted to the 10 SNCUs in Odisha's aspirational districts is displayed in of the 50226 neonates hospitalized, 25259 (50%) were younger than one day, and 20881 (58%), were female. There are 25843 (51%) admissions to out born units and 24383 (49%) admissions to inborn units. There were 14708 (28%), preterm infants. 995 newborns (2%) were under 1000 grams, while 29401 babies (59%) were low birth weight babies (less than 2500 grams).

The reasons for admission of the neonates

Perinatal asphyxia (14421, 29%), neonatal jaundice (9616, 19%), low birth weight (6757, 13%), refusal to feed (5327, 11%), and prematurity (less than 34 weeks, 4363, 9%), were the top five reasons for admission.

The outcome of the admitted neonates

Of the 50226 neonates hospitalized, 37594 (75%) were released once they were well, 5666 (11%) were sent to a higher medical facility for better care, 4883 (10%) expired, and 2083 (4%) were left in the SNCU against medical recommendation.

The reasons for the death of the admitted neonates

The top five causes of death for the admitted neonates were birth asphyxia (1459, 30%), neonatal sepsis (684, 14%), hie of newborn (499, 10%), prematurity (28–37 weeks; 485, 10%), and low birth weight (1000–2499 gm; 462, 9%). of the 50226 admitted neonates, 4883 (9.7%) died.

The reasons for referral of admitted babies to higher centre

5666 newborns, or 11% of the 50226 hospitalized neonates, have been referred to more advanced facilities for treatment. Birth asphyxia (1520, 27%), neonatal haemorrhage (771,14%), neonatal sepsis (720,13%), low birth weight (i.e., 1000–2499 gm, 520,9%), and congenital malformation (453,8%) were the top five reasons for referral.

This table summarizes the performance of each indicator across the specified quarters using symbols to indicate their performance levels. The Table 4 illustrates the Quarter-wise performance of all seven metrics. The composite SQCI performs satisfactorily (0.60-0.66) over the course of the twelve quarters. both the "mortality in normal-weight babies index" and the "rational admission index" performed well. the "index for rational use of antibiotics," "low birth weight survival index," and "optimal bed utilization index" all displayed a combination of sound and satisfactory performance, while the "inborn birth asphyxia index" displayed satisfactory performance. The low-birth-weight admission index, which indicates poor performance.

Table 1: SNCU quality of care index (SQCI) calculation.

S. no.	Indices	Definition	Numerator (N)	Denominator (D)	The formula forthe Index
1.	Rational admission index	The proportion of newborns dischargedwithin 24 hours	No. of newborns discharged in ≤24 hours	Total number of newborns discharged	1– (N/D)
2.	Index for rational use ofantibiotics	The proportion of newborns with sepsis received antibiotics	Number of newbornsreceived antibiotics-number of newborns diagnosed as sepsis	Total admissions	1– (N/D)
3.	Inborn birth asphyxiaindex	Proportion of inborn admitted as Birth Asphyxia	Number of inborns admitted to SNCU withbirth asphyxia	Total number of inborn admissions	1– (N/D)
4.	Index for mortality in normal weight babies	The proportion of deathsin inborn infants' weight 2500 g or more against total admissions of inborn infants' weight 2500 g or more	No. of deaths in inborn weight 2500 g or more	Total admissions of inborn weight 2500 gor more	1– (N/D)
5.	Low-birth-weight admission index	The proportion of low-birth-weight newborns less than 1800 were admitted to	No. of newborns withbirth weight less than1800 g	Total number of admissions	N/D

Continued.

S. no.	Indices	Definition	Numerator (N)	Denominator (D)	The formula for the Index
		the unit	admitted		
6.	Low-birth-weight survival index	The proportion of low-birth-weight babies between 1000 and 1800 g survived	No. of newborns with birth weight between 1000 and 1800 g discharged alive	The total number of newborns with birthweights between 1000 and 1800 g admitted	N/D
7.	Optimal bed utilization index	The average number of newborns admitted per bed per month	Total admissions	Total number of beds × 6 × no. of months	1-1 N/D = 1 - (1 average admission) Average admission = (total admissions / total number of beds × 6 × no. of months) admissions per bed per month is considered the desirable number. The proportion of average admission will mostly be in the range of 0-2. Where the proportion exceeds 2, then the default value will be 0.2.

The values of indices will always range from 0.01 to 1. For the Optimal Bed Utilization Index, we presume that the desired number of admissions per bed per month is 6; hence, any value above or below 6 will be viewed negatively and reflected in the index as such. The denominator will comprise the maximum number of newborns who can be admitted, that is, the number of beds multiplied by the number of months multiplied by the 6 newborns per bedtime. Indicators with higher values indicate poor performance, such as the rational admission index for the rational use of antibiotics, inborn birth asphyxia index, and index for mortality in normal weight babies (e.g., a higher percentage of newborns discharged within 24 hours is undesirable). Therefore, the value is deducted from 1 to make it a positive value. For instance, if 10% of all admissions result in a discharge within 24 hours, the value will be $1 - 0.1 = 0.9$, and the ratio of "Number of deaths in inborn infants with weight 2500 g or more / total admissions of inborn infants' weight 2500 g or more" will be multiplied by 9.99. Consequently, 1% death equals 9.99 points on the overall index. All 7 indices are multiplied to create a composite index, which is then used to calculate the geometric mean by taking the product's square root × 7. SNCU performance index = (rational admission index × index for the rational use of antibiotics × inborn birth asphyxia index × index for mortality in normal weight babies × low birthweight admission index × low birthweight survival index × optimal bed utilization index) $^{1/7}$.¹⁴

Table 2: Purpose of the SQCI indices and performance grading.

S. no.	Index	Purpose of the index (what it tells)
1.	Rational Admission Index: Proportion of newborns discharged within 24 hours	Assesses whether SNCU is adhering to the proportion of possibly unnecessary admissions by looking at the discharge within 24 hours
2.	Index for Rational Use of Antibiotics: Proportion of newborns with sepsis received antibiotics	Assesses the rational and judicious use of antibiotics only in babies diagnosed with sepsis in the SNCU units
3.	Inborn Birth Asphyxia Index: Proportion of newborns admitted as birth asphyxia	Assesses the proportion of inborn admitted with birth asphyxia. It reflects the quality of intranatal care and management of asphyxia in the labor room
4.	Index for Mortality in Normal Weight Babies: Proportion of death that takes place in inborn with a weight 2500 g or more	The index assesses the quality of care being provided in the SNCUs. It depicts the proportion of deaths that occur in inborns admitted with birth weight more than and equal to 2500 g
5.	Low Birth Weight Admission Index: Proportion of low-birth-weight babies (<1800 g admitted to the unit)	This index assesses the proportion of admission of low-birth-weight babies < 1800 g admitted to the unit. As per admission protocol, SNCU level II units cater to all babies with birth weights between 1200 and 1800 g

Continued.

S. no.	Index	Purpose of the index (what it tells)
6.	Low Birth Weight Survival Index: Proportion of low-birth-weight babies(1000-1800 g survived)	This index assesses the optimal feeding, hygiene, and warmth provided to LBWs inside SNCUs for survival. LBW survival has been a proxy indicator for the clinical practices followed inside SNCUs since LBW babies require special feeding assistance and management
7.	Optimal Bed Utilization Index	This index calculates the average number of newborns admitted per bed per month in an SNCU. This index depicts SNCUs with overcrowding or underutilization of beds based on the available bed strength—the average number of newborns admitted per bed per month. Desirable admissions in SNCUs are 6 patients per bed per month (assuming 5-day stays per baby)
Performance grading of the indices		
Performance grading		Range of index values
Excellent		0.80-1.0
Satisfactory performance		0.60-0.79
Needs improvement		0.40-0.59
Poor		0.00-0.39

Table 3: Profile of admitted neonates (n=50226).

Person characteristics	Number	Proportion
Age group		
Less than one day	25259	50%
1 to 3 days	12065	24%
4 to 7 days	5426	11%
More than 7 days	7476	15%
Gender		
Male	29310	58%
Female	20881	42%
Agender	35	0%
Delivery location		
In born	24383	49%
Out born	25843	51%
Maturity		
Pre-term	14708	29%
Full-term	33846	67%
Post-term	1672	04%
Birth weight		
ELBW (<1000 gm)	995	2%
VLBW (1000-1499 gm)	5321	11%
LBW (1500-2499 gm)	23085	46%
Normal (2500 gm+)	20825	41%

Table 4: Quarter-wise performance of all seven indicators.

Year	QTR	Compo site SQCI	Rational admission index	Index for rational use of antibiotics	Inborn birth asphyxia index	Mortality in normal-weight babies index	Low birth weight admission index	Low birth weight survival index	Optimal bed utilization index
2020	Q1	★★★★ ★☆☆ (0.60)	★★★★★☆☆ (0.78)	★★★★★☆☆ (0.68)	★★★★★☆☆ (0.67)	★★★★★☆☆ (0.95)	★★★☆☆☆☆ (0.26)	★★★★★☆☆ (0.61)	★★★★★☆☆ ☆ (0.53)
	Q2	★★★★ ★☆☆	★★★★★☆☆ (0.81)	★★★★★☆☆ (0.59)	★★★★★☆☆ (0.68)	★★★★★☆☆ (0.94)	★★★☆☆☆☆ (0.24)	★★★★★☆☆ (0.65)	★★★★★☆☆ ☆ (0.57)

Continued.

Year	QTR	Compo site SQCI	Rational admission index	Index for rational use of antibiotics	Inborn birth asphyxia index	Mortality in normal- weight babies index	Low birth weight admission index	Low birth weight survival index	Optimal bed utilization index
		(0.60)							
	Q3	★★★ ★☆☆ (0.61)	★★★★★ (0.76)	★★★★★ (0.58)	★★★★★ (0.67)	★★★★★ (0.93)	★★★☆☆ (0.27)	★★★★★ (0.60)	★★★★ ☆ (0.67)
	Q4	★★★ ★☆☆ (0.63)	★★★★★ (0.79)	★★★★★ (0.62)	★★★★★ (0.69)	★★★★★ (0.94)	★★★☆☆ (0.27)	★★★★★ (0.68)	★★★★ ☆ (0.65)
2021	Q1	★★★ ★☆☆ (0.66)	★★★★★ (0.79)	★★★★★ (0.73)	★★★★★ (0.71)	★★★★★ (0.95)	★★★☆☆ (0.28)	★★★★★ (0.65)	★★★★ ★ (0.74)
	Q2	★★★ ★☆☆ (0.64)	★★★★★ (0.79)	★★★★★ (0.70)	★★★★★ (0.68)	★★★★★ (0.94)	★★★☆☆ (0.24)	★★★★★ (0.62)	★★★★ ★ (0.80)
	Q3	★★★ ★☆☆ (0.62)	★★★★★ (0.81)	★★★★★ (0.71)	★★★★★ (0.68)	★★★★★ (0.96)	★★★☆☆ (0.24)	★★★★★ (0.62)	★★★★ ☆ (0.60)
	Q4	★★★ ★☆☆ (0.61)	★★★★★ (0.82)	★★★★★ (0.74)	★★★★★ (0.72)	★★★★★ (0.96)	★★★☆☆ (0.25)	★★★★★ (0.66)	★★★☆☆ ☆ (0.44)
2022	Q1	★★★ ★☆☆ (0.61)	★★★★★ (0.82)	★★★★★ (0.72)	★★★★★ (0.68)	★★★★★ (0.94)	★★★☆☆ (0.26)	★★★★★ (0.67)	★★★☆☆ ☆ (0.47)
	Q2	★★★ ★☆☆ (0.59)	★★★★★ (0.83)	★★★★★ (0.69)	★★★★★ (0.67)	★★★★★ (0.93)	★★★☆☆ (0.22)	★★★★★ (0.68)	★★★☆☆ ☆ (0.45)
	Q3	★★★ ★☆☆ (0.61)	★★★★★ (0.83)	★★★★★ (0.72)	★★★★★ (0.69)	★★★★★ (0.93)	★★★☆☆ (0.23)	★★★★★ (0.66)	★★★★ ☆ (0.54)
	Q4	★★★ ★☆☆ (0.60)	★★★★★ (0.81)	★★★★★ (0.71)	★★★★★ (0.72)	★★★★★ (0.96)	★★★☆☆ (0.23)	★★★★★ (0.63)	★★★☆☆ ☆ (0.51)

Legend: ★★★★★=0.80-1.00 (Excellent), ★★★★☆=0.60-0.79 (Satisfactory), ★★★☆☆=0.40-0.59 (Needs Improvement), ★★☆☆☆=0.00-0.39 (Poor).

DISCUSSION

Specific morbidities, deaths, and referrals of neonates hospitalized to SNCUs are reported in our study. During the study period (January 2020–December 2022), 50226 neonates (49% inborn and 51% outborn) were admitted to SNCU. Different findings were found in another study by Kumar R et al, in Uttarakhand, India (inborn 60.8%, outborn 39.2%). Mendu et al. reported inborn 82.76%, outborn 17.24%; Rahman and Begum reported inborn 64.7%, outborn 35.2% in Tezpur, Assam, India, Anupama et al. reported inborn 60.5%, outborn 39.5%; and Prasanna et al. reported inborn 58.5%, outborn 41.5 percent in Telangana state.¹⁵⁻¹⁹

The majority of admissions were for male babies (58%) as opposed to female babies (42%), which is relevant to research by Jena et al. and Shah et al, Kumar R et al. from Uttarakhand, India (59.54% vs. 40.46%), Rahman K

and Begum R from Tezpur, Assam (58.7% vs. 41.2%), Sharma AK and Gaur A from Gwalior, Madhya Pradesh (63.07% vs. 36.92%), Som et al, from Odisha (60.2% vs. 39.8%), and Modi et al, from Gujarat, India (56.36% vs. 43.63%), also showed similar findings.^{15,17,22-24} To completely understand the superior health-seeking behavior that male babies display, more research may be required.^{20,21}

In the current study, LBW newborns made up 59% of the total. The percentage of LBW admissions in earlier studies was 49.8% for Rahman K and Begum et al in Tezpur, Assam, 47.7% for Anupama D et al in Silchar, Assam, 61.5% for Sharma AK and Gaur et al in Gwalior, Madhya Pradesh, Shah et al (63.00%), Baruah and Panyang (66.10%), and 61.6% for Rakholia et al, in

Uttarakhand, India. The findings of all these studies are comparable to ours. In the current study, 67% of the

babies were term, whereas 29% were preterm.^{17,18,21,22,25,26} Birth asphyxia is responsible for 29% of the morbidities among the admitted neonates, with jaundice (19%), low birth weight <1800 gm (13%), refusal to feed (11%), and prematurity <34 weeks (9%). Asphyxia at birth occurs far more frequently than anticipated. The number exceeded the findings of earlier research by Baruah and Panyang et al (16.70%), Shah et al, (16.00%), and Ravikumar et al, (15.7%).^{15,21,25} To detect newborn asphyxia early on, strict intrapartum monitoring will be helpful. Poor prenatal care, delayed referrals of high-risk moms, restricted access to medical facilities, poor intranatal care, delayed Caesarean sections in situations of prolonged labor, and insufficient neonatal resuscitation are some of the causes of this. The factors mentioned above might be clarified by more research. Counseling families on physiological jaundice and the importance of continuing to nurse their infants is one of the most crucial strategies to reduce newborn jaundice.

The overall death rate was 10%, which was similar to studies by Rahman K and Begum et al (11.4%) in Tezpur, Assam, and Anupama et al, (12.37%) in Silchar, Assam. Prematurity, hypoxia ischemic encephalopathy (HIE), birth asphyxia, and sepsis were the main causes of newborn referral and mortality. The fact that all units provide Level II SNCU treatments and are directed to tertiary hospitals for ventilatory support or other procedures may be the reason for the referral rate of 11%.^{17,18} The paper has emphasized the use of the SQCI to improve the inpatient care of tiny and sick neonates. The majority of SNCUs frequently uses the SQCI tool. Nevertheless, the information is not utilized to make improvements. We tried to illustrate how to make use of the available data. The established framework will enable the authorities to identify the primary issues with care quality, discuss the findings during review sessions, and take the necessary action. Clinical practices will therefore be strengthened by mentoring and demonstrating a concerted effort. The data from this study could be used to inform state-level health policy and planning, as well as to identify critical initiatives that need to be implemented.

The parameters given do not immediately indicate the quality of care, therefore even while a vast amount of data is being created and preliminary analyzed, it is not being used optimally for taking action. SNCU Quality of Care makes use of information that is already there in SNCU Online. This composite index uses seven criteria to represent different aspects of SNCU care quality. In contrast to research by Shah et al and Jena et al, the majority of admissions were male babies (60.18%) as opposed to female babies (39.80%).²¹ There were no unnecessary admissions, as evidenced by the high ratings that each SNCU received on the reasonable admission indicator.

Inborn birth asphyxia is a marker of the link between the mother and newborn units and documents resuscitation

efforts in the SNCU labor room. Overall, four SNCUs continued to operate adequately, whereas six SNCUs continued to operate effectively. Rational Use of Antibiotics shows whether the SNCU is overusing antibiotics, whether six facilities are satisfactory, whether three facilities perform well, and whether one facility performs poorly.

The SNCU's overall clinical procedures and care are shown by an infant mortality rate of more than 2,500 g, all institutions receive good ratings. Admissions with low birth weight are a sign of how well the SNCU is fulfilling its purpose.

There is poor performance in every study unit. A useful instrument for assessing the quality of newborn care services provided in Indian Special Newborn Care Units is the SQCI index. The index can assess other units for quality improvement or track a unit's performance over time. A collection of metrics called the Special Newborn Care Unit (SNCU) Quality of Care Indices (SQCI) are used to assess the standard of care given in SNCUs.

The SQCI instrument was used in a study by Harish Kumar et al, at 11 special newborn care units (SNCUs) in two Indian states (Odisha and Rajasthan). In a QI method, he discovered that the SQCI tool is a useful and replicable intervention. The comprehensive scores generated as part of the regular system indicate that, based on initial findings, it does strengthen the implementation of the programs at SNCUs.¹⁴ The implementation of SQCI throughout 18 SNCUs in aspirational areas of Jharkhand, Uttarakhand, Himachal Pradesh, Punjab, and Haryana is depicted in the USAID Vridhhi project by Saboth Md et al.²⁸ By enabling SNCU staff and program officers to use SQCI throughout a year, from April 2019 to June 2020, the goal was to produce evaluated quarterly reports for action with the aim of sustainability.

One serious problem with the SQCI tool is that it is not validated. During the index's development, a few SNCUs were independently assessed by trained neonatologists to get feedback on the reliability of the SQCI. Overall, the expert remark aligned with the findings of the SQCI approach. However, the reliability of the tool has not been evaluated. There is another problem with the scoring system. A score of 0.7 and 0.9 on the quality-of-care scale signify the same thing, yet there might be a big variation. Scores simply show how well a service parameter is performing. Likewise, these proxy indicators provide a general picture of the existing healthcare system constraints. Clinically, the indication may not provide all the information.

For example, depending on a child's condition at admission, a clinician might suggest an SNCU for primary care. We cannot say that the admission is illogical in this case. Just as antibiotics can be administered in appropriate circumstances, the doctor

may overlook the reason for the prescription. As a quality audit that addresses ways to improve health systems, the index should not be seen as the pinnacle of clinical quality of care metrics. To assess how quality improvement affects outcomes, future research should look at the tool's validity and reliability, the addition of indicators, and long-term evaluation. The study was conducted during the Covid Pandemic in 2020–2022. As a result, the study's conclusions could not be explained by the post-COVID period.

CONCLUSION

Perinatal asphyxia was the primary reason for admission to the SNCUs (14421, 29%), followed by newborn jaundice (19%) and LBW (13%). Therefore, it is necessary to do a thorough study on the health facility's readiness to handle perinatal asphyxia. Overall, the all-district Composite SQCI demonstrates satisfactory performance. Additionally, the performance in the twelve quarters is satisfactory. Gajapati had the lowest score (0.55) and Raygada had the greatest score (0.68) out of ten aspirational districts.

Recommendations

Over the course of three years, the LBW Admission (<1800 gm) Index has performed poorly; prevention and control are necessary. One useful instrument for raising the standard of care for babies in India is the SQCI. To find areas where treatment can be enhanced and to monitor advancement over time, it should be examined on a frequent basis. One of the main concerns of policymakers is the quality of services. Using SQCI makes it easier to use data for evidence-based decision-making by providing a methodical framework for analysis, monitoring, and evaluation.

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