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Table 3: Personal history of the Children and their mothers

Variables	Categories	Count	Percentage
Birth order of the admitted child	1	14	37%
	2	22	58%
	3	2	5%
Immunization status of the child	partial	1	3%
	full	37	97%
Breastfeeding history	Not breastfed	2	5%
	*EBF <6 month	31	82%
	*EBF for >6 month	5	13%
Started complementary feeding	before 6 months	16	42%
	after 6month	22	58%
History of IFA intake by mother during last pregnancy	Infrequently	7	18%
	Only 6 months before delivery	24	63%
	6 months before and after delivery	7	18%

**Exclusive breast feeding-EBF*

Table 4: The Relationship Between Exclusive Breastfeeding and Child Z Scores Upon Admission

	Z score			
Breastfeeding status	**<-3**		**<-4**	
	Count	**row%**	**Count**	**row%**
Not breastfed	0	0.00%	2	100.00%
*EBF <6 month	23	74.20%	8	25.80%
*EBF for >6 month	5	100.00%	0	0.00%

**Exclusive breast feeding-EBF*

The **Table 4** shows a significant positive association between the longer duration of breastfeeding and better z-scores at admission was noted ($\chi^2 = 7.39$, $p = 0.025$).

During the admission ***(Figure 2),*** medical history assessments focused on the child's primary symptom, often neglecting standard pre-admission guidelines. For example, children with ARI were routinely questioned about cough and recent food intake, but broader history topics, such as diet and breastfeeding, were covered in fewer than 70% of cases. The duration of stay was not significantly associated with the presenting clinical complains.

Exit indicators provide information about the proportion of patients completing the treatment successfully or not successfully (recovered, defaulter, death). They are calculated as a percentage of the total number of exits (discharges) during the reporting month. Exit indicators in **Table 5** shows 97% of patients completing treatment and no deaths. Only 3% of patients were defaulters, well within the acceptable 15% threshold. Patients showed weight gain averaging 11± 6 g/kg/day, which exceeds the minimum standard of 8 g/kg/day. The mother of the defaulting female child disclosed that she abstained from taking vitamin and iron tablets during pregnancy due to cultural beliefs that they could induce abortion. She departed the center prematurely, citing a social event in their village. The admitted child was the third-born, aged 8 months, with two older siblings alive. The mean weight, length, and MUAC at admission were 6.9±2.5 kg, 75.6±14 cm, and 10.2±4.2 cm, respectively.

Table 5: Outcome (Exit) indicators[6]

Indicators	Observed value	Acceptable	Alarming
Recovery rate (total recovered/total exit) (%)	97%	>75%	50%
Non recovery rate (non-recovered/total exit) (%)	0%		
Defaulter rate (total default/total exit) (%)	3%	<15%	>15%
Death/case fatality rate (total death/total exit) (%)	0%	<10%	>15%
Average daily weight gain (g/kg/day)	11±6	>8 g/kg/day	<8 g/kg/day
Average length of stay (mean ± SD)	<3week	<4 week	>6 week

Table 6: Relation of Weight gain to Duration of stay in the facility

Duration of stay	Good (≥10)		Moderate (5–<10)	
(days)	Count	Column %	Count	Column %
<7	0	0%	0	0%
>14	19	91%	9	100%
Jul-14	2	10%	0	0%

Citation: Priti Pratyasha, D Shobha Malini, Sasmita Kumari, Amita Patnaik, Sarojini Kesh, Durga Madhab, Sithal Dalai. A Cross-sectional Study on Effectiveness of Nutritional Interventions done in Nutritional Rehabilitation Centre at a Tertiary Care Hospital in Southern District of Odisha. Fortune Journal of Health Sciences. 7 (2024): 725-732.

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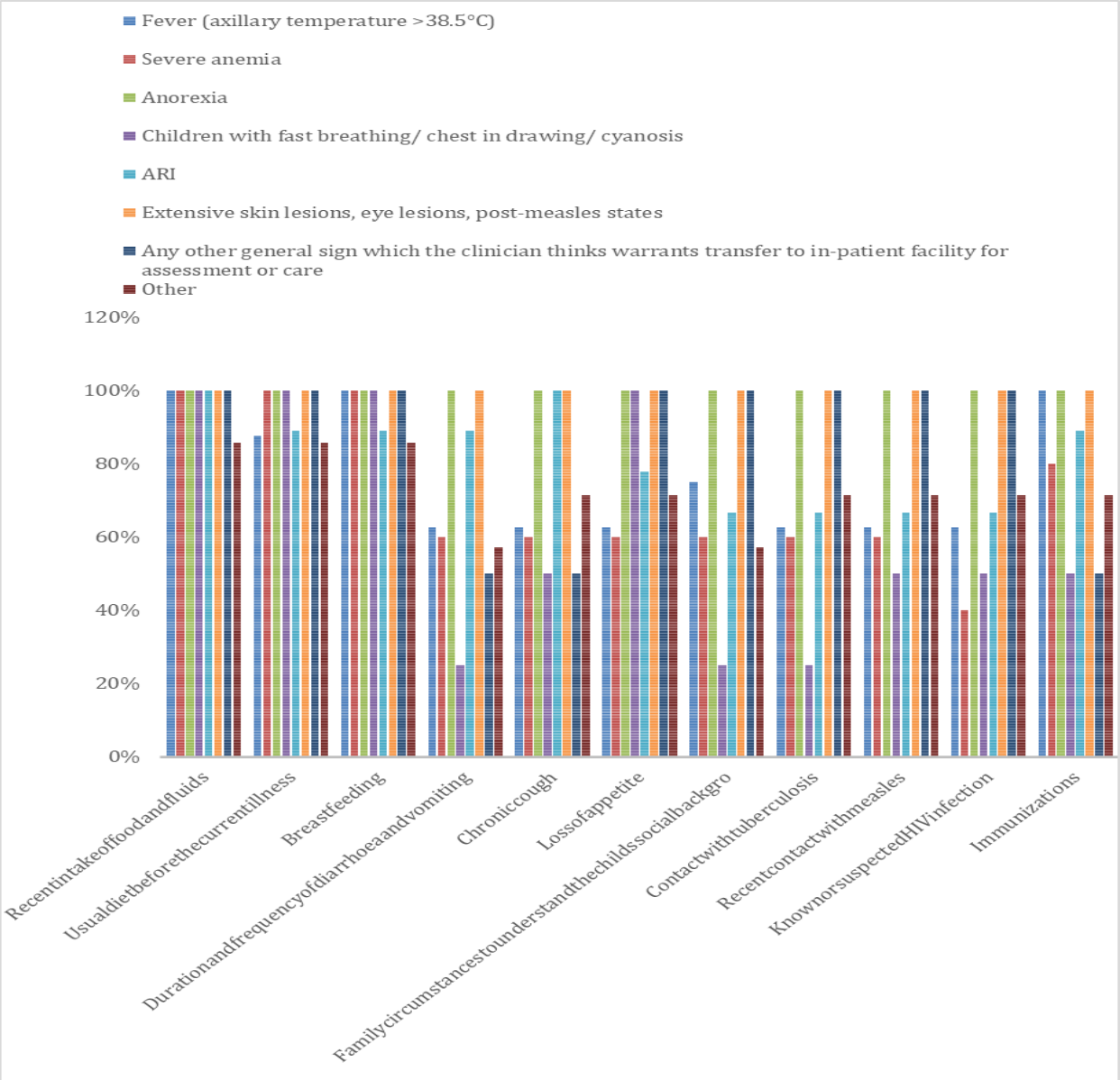

Figure 2: Comparison of history taken with the presenting complain during admission[6]

Statistically significant weight gain **(Table 6)** was associated with longer stays (p = 0.0015), and MUAC improved steadily from admission to follow-up.

There was consistent increase in mean Length, MUAC and Weight of the children over the study cycle since admission till 4th follow up (**Figure 3**). Till the time of discharge, the mother's counselling about further family planning, awareness regarding danger signs requiring immediate follow up and information regarding the special medications for the child were only 8% (3), 3% (1) and 37% (14) respectively. Inquiry into specific problems about the past diet 47% (18), foods available at home that can be used 74% (28) and counselling on the medications to be continued at home 63% (24) were also below satisfaction level. Mother's perception showed no statistically significant association with socio-demographic variables such as mother's education, socio-economic status, area of residence, etc.

The qualitative findings gathered from interviews with both mothers and staff at the NRC highlighted several challenges and experiences (**Table 7**). Institutionally, the staff discussed issues such as early discharge without proper follow-up and bed shortages, particularly during peak months. "We have to bring in extra mattresses, and mothers sleep on the floor with their children," shared the nutritionist. Financial assistance to mothers was consistent, with Rs. 100/ day provided during their stay, but no compensation was

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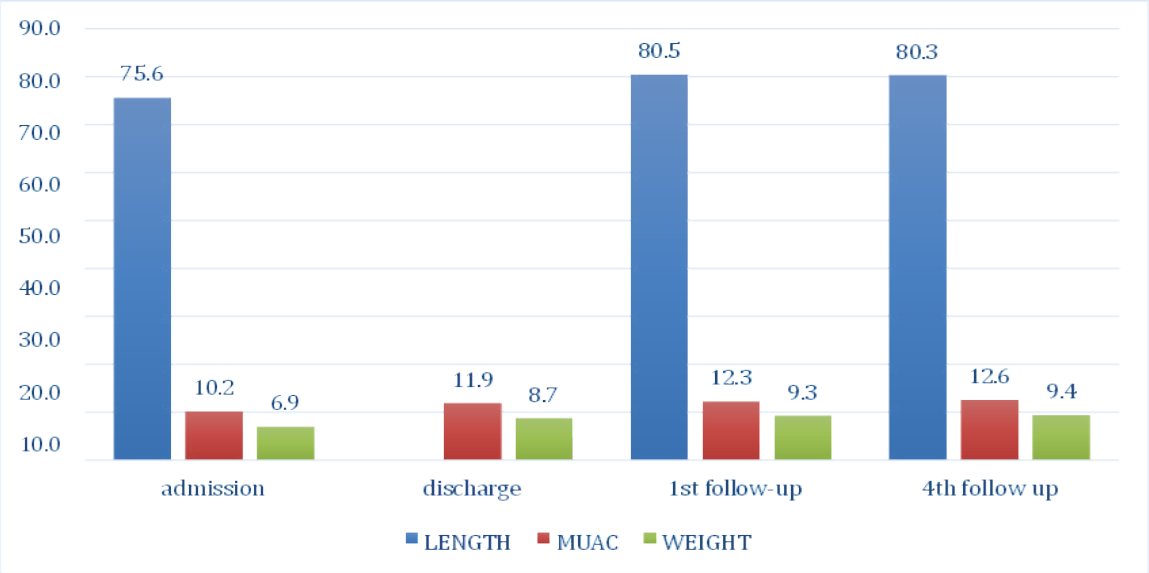

Figure 3: Change in the mean value of various anthropometric measurements over the study period

Table 7: Themes and subthemes emerged from the qualitative data

Serial number	Themes	Sub themes
a	Institutional Data (Interview with the Counsellor cum Nutritionist)	1. Early discharge 2. Bed shortage 3. Financial assistance 4. Cognitive and sensory development 5. Counselling
b	Food Preparation (Interview of Cook cum Attendant)	1. Role overlap 2. Diets 3. Food preparation and recipes 4. Feeding time 5. Staff shortage
c	Patient satisfaction (mother's interview)	1. **Maternal health and nutrition** Challenges in Breastfeeding Lack of Prenatal Care and Nutrition 2. **Child Health and Well-being** • Growth development issue • Pre-existing health conditions • Feeding difficulties • Successful treatment 3. **Health system and accessibility** • Hygiene • Communication barrier due to illiteracy

given if the child was discharged early without a 15% weight gain. Concerns about insufficient play stations were raised by the nutritionist: "We've brought it up, but no real action has been taken." Food preparation faced staff shortages, with attendants doubling as cooks and working without breaks. "We prepare F-100 and other meals, but we're short on hands," the attendant explained. Feeding times and meal quality were maintained, but the staff shortage caused strain. From the mothers' perspectives, they expressed concerns about their children's health, with one saying, "My baby doesn't show any growth or strength." Another mother mentioned difficulties with feeding, explaining, "At home, my child wasn't eating properly, and the same continued here." While some noted improvements, such as reduced vomiting, others shared dissatisfaction with the overall care: "My child's health worsened, and we had to take him to another doctor."

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Hygiene was another concern, with one mother stating, "We were not provided with soap for handwashing, so I had to buy my own." Overall, while most mothers found the services adequate, they identified areas requiring improvement, particularly in staff availability, hygiene, and post-discharge care support.

Discussion

The study utilized various methods of data collection, including observations, informal discussions, questionnaires, and in-depth interviews, to triangulate data and mitigate biases arising from its limited duration and sample size. Findings revealed that while facility infrastructure adhered to established protocols, areas requiring improvement included adequate bedding, hygiene materials, and child-friendly environments. Despite sufficient space, the external surroundings lacked stimulation, adversely affecting children's cognitive development, an aspect often overlooked in prior studies[1,12–14]. Demographically, most patients came from marginalized communities, with a significant correlation between maternal education and family social status. Notably, 61% of patients belonged to Scheduled Castes and Tribes, echoing previous findings on early childhood malnutrition in such populations[3,13]. The study found that higher IFA intake during pregnancy was linked to better breastfeeding outcome not explored much previously. History taking during admission was not satisfactory with missing clues to important indicators like breastfeeding, immunization history etc. This has not been explored in previous studies[4,13–15].

Regarding clinical outcomes, the discharge criteria for infants and children were stringently followed, with an impressive 87% achieving targeted weight gain (>15%) upon discharge, surpassing recovery rates reported in prior literature[13]. Counselling on further family planning, awareness of danger signs, different playing methods for child's neuro cognitive and sensory-motor development were not much touch upon unlike the study by Tandon et al. that reported 3/4th of participant receiving the same[1,2]. Weight gain was positively associated with the duration of stay in the facility, but the duration of stay was not significantly associated with the presenting clinical complaints. The absence of follow-up arrangements in case of early discharge from the center and staff shortages further complicated care delivery, underlining the need for qualitative explorative studies on patient satisfaction, which remain under-researched [13–15]. The study's generalizability is limited by its single-centre scope and brief duration, highlighting the need for additional research in varied settings to confirm these results and address existing gaps. Interviews with relevant program managers and administrative staff could not be conducted due to lack of consent. However, a key strength of this study is its comprehensive assessment including the observation and interviews, and future research should take a broad approach, examining all aspects of the centre rather than focusing solely on exit indicators.

Conclusion

The comprehensive assessment of the Nutritional Rehabilitation Centre (NRC) shed light on both its strengths and areas for enhancement. Notably, the meticulous record-keeping, proficient food preparation, and positive treatment outcomes underscored the facility's competence. However, operational challenges such as inadequate discharge follow-up, seasonal bed shortages, and financial assistance discrepancies were identified, emphasizing the need for administrative improvements. Moreover, qualitative insights revealed concerns regarding hygiene, staff shortages, and maternal education gaps, calling for targeted interventions to enhance overall care quality. Addressing these issues, including bolstering staff numbers, improving hygiene infrastructure, and providing tailored maternal education, can significantly elevate the facility's effectiveness and ensure better outcomes for both mothers and children.

Acknowledgement

We would like to express our gratitude to the district administration and NRC staff for permitting us to carry out the study. Our heartfelt thanks also go to the parents and children for their patience and cooperation during the physical exams and interviews. Finally, we are grateful to ICMR for the scholarship program that provided undergraduate students with the opportunity to conduct research and gain valuable firsthand experience.

Source of funding:

Short-Term Studentship Program (STS) conducted by the Indian Council of Medical Research (ICMR ID: 2023-00051)

Conflicts of Interest

The authors declare that they have no conflict of interest.

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