

**ASSESSMENT OF FACILITY-BASED MANAGEMENT OF
CHILDREN WITH SEVERE ACUTE MALNUTRITION AT TAPI
DISTRICT, GUJARAT**

**Dissertation
At
ICDS, Gujarat**

**By
Chetna Chaudhary**

**Under the guidance of
Dr. Seema Mehta**

**MBA Hospital & Health Management
2013–15**


**Institute of Health Management Research
Jaipur
2015**

TO WHOMSOEVER MAY CONCERN

This is to certify that Dr. Chetna Chaudhary, student of MBA Hospital and Health Management (2013-2015) from The IIHMR University, Jaipur has undergone internship training at ICDS, Gujarat from 5th March, 2015 to 5th May, 2015.

The Candidate has successfully carried out the study designated to her during internship training and her approach to the study has been sincere, scientific and analytical.

The Internship is in fulfillment of the course requirements.

I wish her all success in all her future endeavors.



Col, (Dr.) Ashok Kaushik
Dean, Academics and Student Affairs
The IIHMR University, Jaipur



Prof. Seema Mehta
Associate Professor
IIHMR University, Jaipur



ICDS Branch, District Panchayat Tapi

Block – 9, Ground Floor, Green Building Complex, Panvadi- Vyara
Dist. Tapi, Gujarat, INDIA. Pin/Zip - 394650 Ph. 02626 - 224577



Reg. No. : 26

Date :- 13 / 5 / 2015

The certificate is awarded to

Dr. Chetna Chaudhary

In recognition of having successfully completed her Internship in

ICDS, Tapi District, Gujarat

And has successfully completed her Project on

Assessment of Facility-based management of children with Severe Acute Malnutrition (SAM) at Tapi District, Gujarat

She came across as a committed, sincere & diligent person who has a
strong drive & zeal for learning

We wish her all the best for future endeavors.

DR. K.T. CHAUDHARI

Program officer
ICDS Society
Tapi district

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This is to certify that the dissertation titled **Assessment of Facility-based management of children with Severe Acute Malnutrition at Tapi District, Gujarat** submitted by **Dr. Chetna Chaudhary**.

Enrollment No. 18-1435, under the supervision of Professor **Seema Mehta** for award of MBA Hospital and Health Management of the university carried out during the period from **March 5, 2015 to May 5, 2015** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Chetna

Signature

Chetna Chaudhary

MBA-18

IIHMR University, Jaipur

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **Assessment of Facility-based management of children with Severe Acute Malnutrition at Tapi District, Gujarat** is submitted by **Dr. Chetna Chaudhary** (Enrollment No 1435) 18th Batch under the supervision of **Prof. Seema Mehta, Associate Professor, The IIHMR University, Jaipur**, for award of MBA Hospital and Health Management of the university carried out during the period from **March 5, 2015 to May 5, 2015** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this or any other Institute or other similar institution of higher learning.

Signature

Dr. Chetna Chaudhary
18thBatch (1435)
MBA Hospital and Health Management
2013-2015

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Dr. Chetna Chaudhary
18thBatch (1435)
MBA-Hospital and Health Management

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List of Abbreviations

CHC- Community Health Centre
CMTC- Child Malnutrition Treatment Centre
ICDS- Integrated Child Development Scheme
IIHMR- Institute of Health Management and Research
MUAC- Mid-upper Arm Circumference
NRC – Nutritional Rehabilitation Centre
PHC- Primary Health Centre
SAM – Severe Acute Malnutrition
WFH- Weight for Height

DISSERTATION

Assessment of Facility-based management of children with Severe Acute Malnutrition at Tapi District, Gujarat

1.1 Abstract

A facility-based cross-sectional study was conducted for 2 months at 1 nutritional rehabilitation centre(NRC) and 5 child malnutrition treatment centers(CMTC) in Tapi district of Gujarat with an objective of assessing the effectiveness of these centers in improving the nutritional status of malnourished children. Assessment was done on the basis of availability of Infrastructure, Human resources, equipments and output indicators.

All the facilities had adequate infrastructure with uninterrupted 24 hour water and power supply and adequate number of human resources according to the guidelines given by Ministry of Health and Family Welfare, but in terms of training status, only Three facilities (50%) had medical officers (MO's) who are trained in Facility Based Care of Severe Acute Malnutrition and no unit had staff nurse or nutritionist trained in SAM. Staff knowledge was found to be adequate in all the facilities. All the facilities were well-equipped according to the guidelines, with only Geyser and Room thermometer lacking in all the facilities. Kitchen and pharmacy supplies were in adequate stock. Registers and Monthly Progress Report and Quarterly Progress Report were maintained by the staff according to the given format from NRHM.

Severe acute malnutrition (SAM) is defined as very low weight-for-height/length (Z- score below -3SD of the median WHO child growth standards), a mid-upper arm circumference <115 mm, or by the presence of nutritional edema. Data of 107 children with SAM aged between 6-59 months admitted in NRC and CMTCs during December, 2014 to February 2015 was analyzed retrospectively. Admission and Discharge criteria were according to the Operational Guidelines on Facility Based Management of Children with SAM given by Ministry of Health and Family welfare.

The mean age (SD) of the patients was 28.01 months and 58 percent of the admitted children (107) were girls. A majority of the admitted children belonged to Scheduled Tribes (88%) and 90% was below poverty line (BPL). A total of 100 children were included in the analysis: 42 boys and 58 girls were analyzed for effect of nutritional interventional measures on weight gain as 7 children did not stay at the centers for the entire duration of 14 days. Of them, two children were referred and five children dropped out.

Children were typically admitted for 21 days and discharged irrespective of their attaining/not attaining target weights. Twelve percent of the children had achieved target weight gain of 15% after 21 days and only 13% of the children who had come for third follow-up visit(n=84) had attained the target weight gain. There was no death reported in any of the facility. After three follow-up visits, only about half of the children had gained weight, rest had either lost weight or there was no change in weight at all.

It is evident from results, that these facilities have adequate infrastructure, equipment and knowledgeable staff and are effective in improving the condition of admitted children demonstrated by high survival rates, but there is low recovery rate(weight gain<15%) and effects are not sustained following discharge. This may be due to lack of parental awareness and dietary practices followed in tribal area hence, there is an urgent need to link these centers with community-based models for follow-up and improve nutritional counseling given to parents to maintain the weight gain achieved and therapeutic foods currently used need to be improved to ensure the full recovery of all children admitted.

1.2 Introduction

Globally under nutrition contributes to nearly 35% i.e. three million deaths of children below five years of age. ⁽¹⁾The World Bank estimates India is among one of the most burdened countries in the world for childhood malnutrition. The prevalence of underweight children in India is among the highest in the world, and is nearly double that of Sub-Saharan Africa with awful consequences for morbidity, mortality and efficient economic growth. ⁽²⁾

Severe acute malnutrition (SAM) defined as very low weight-for-height/length (Z- score below -3SD of the median WHO child growth standards), a mid-upper arm circumference <115 mm, or by the presence of nutritional edema, remains a major killer of children as mortality rates in children with severe wasting - a widespread form of SAM - are nine times higher than those in well-nourished children. ⁽¹⁾

The prevalence of Severe Acute Malnutrition (SAM) in children is very high in spite of overall economic development in India. The National Family Health Survey-3 (NFHS-3) conducted by Government of India (2005-2006) showed that prevalence of severe wasting is 6.4 percent among all children under-five years of age. The NFHS data on the nutrition status of children in Gujarat shows that 41.1% of under three and 45% under five children are under-weight. Amongst Under-three children 49.2% are stunted and 19.7% are wasted. Rate of under five children with ($<3SD$) weight for height which is a cut off for SAM is 5.8%.

In Gujarat, “Mission Balam Sukham” was launched with an aim to combat malnutrition across the state. It includes preventive as well as curative approach for management of malnourished children. Home or Community Based management focuses on preventive aspect and Inpatient or Facility Based management focuses on curative aspect. Facility-based management is provided by Nutrition Rehabilitation Center (NRC) as "Bal Sanjeevani Kendra at District hospital and Child Malnutrition Treatment Center (CMTC) as "Bal Sewa Kendra" at PHC/CHC/ Sub District level.

Under this program malnourished children with medical needs are enrolled residentially in the District hospital/CHC level for 21 working days where they are provided 6-8 times supervised diet, micronutrient supplementation and medicines. During this period mothers of malnourished children are also provided wage loss compensation for the period they stay in the facility.

SAM is a preventable and treatable cause of morbidity and mortality in children below five years of age. It has been established that early childhood nutrition is the single most important child survival intervention. ⁽³⁾To reduce morbidity and mortality among children with SAM, particularly those with medical complications, **facility based management** has been started with the objective to provide clinical management and to promote physical and psychosocial growth of these children.

The fourth goal of the Millennium Development Goals declared by United Nations is to reduce under-5 child mortality rate by two third from 1990 to 2015. It is not possible to

achieve the goal unless and until the issue of child malnutrition is brought forward and given more importance on social and political platforms

The objective of the study was to assess the effectiveness of facility-based care in providing therapeutic care and improving the nutritional status of children with SAM in Gujarat.

Facility-based management of SAM (NRC/CMTC)

Nutrition Rehabilitation Center (NRC)/Child Malnutrition Treatment Centre (CMTC) is a unit in a health facility where children with Severe Acute Malnutrition (SAM) are admitted and managed. Children are admitted as per the defined admission criteria and provided with medical and nutritional therapeutic care. Once discharged from the unit, the child continues to be in the Facility-Based management program till she/he attains the defined discharge criteria from the program.

Objectives of facility based management of SAM

- To provide clinical management and reduce mortality among children with severe acute malnutrition, particularly among those with medical complications.
- To promote physical and psychosocial growth of children with severe acute malnutrition (SAM).
- To build the capacity of mothers and other care givers in appropriate feeding and caring practices for infants and young children
- To identify the social factors that contributed to the child slipping into severe acute malnutrition.

Services provided at the facility:

- 24 hour care and monitoring of the child.
- Treatment of medical complications
- Therapeutic feeding.
- Providing sensory stimulation and emotional care.
- Social assessment of the family to identify and address contributing factors.
- Counseling on appropriate feeding, care and hygiene.

- Demonstration and practice- by -doing on the preparation of energy dense child foods using locally available, culturally acceptable and affordable food items.
- Follow up of children discharged from the facility

➤ **Criteria for admission for inpatient treatment**

For children 6-59 months

Any of the following:

- MUAC <115mm with or without any grade of oedema
- WFH < -3 SD with or without any grade of oedema
- Bilateral pitting oedema +/- (children with oedema +++ always need inpatient care)

With any of the following complications:

- Anorexia (Loss of appetite)
- Fever (39 degree C) or Hypothermia (<35 C)
- Persistent vomiting
- Severe dehydration based on history and clinical examination
- Not alert, very weak, apathetic, unconscious, convulsions
- Hypoglycemia
- Severe Anemia (severe palmar pallor)
- Severe pneumonia
- Extensive superficial infection requiring IM medication
- Any other general sign that a clinician thinks requires admission for further assessment.

A child with SAM and medical complications could come as a referral from a community health worker (ANM, AWW or ASHA) or from a peripheral health facility (PHC, CHC) or may come directly to the health facility (self referral). Each SAM child should be immediately screened to identify medical complications and its severity.

➤ **Criteria for discharge**

- Oedema has resolved
- Child has achieved weight gain of > 15% and has satisfactory weight gain for 3 consecutive days (>5 gm/kg/day)
- Child is eating an adequate amount of nutritious food that the mother can prepare at home
- All infections and other medical complications have been treated
- Child is provided with micronutrients and Immunization is updated

Where community based programme is well functioning, child can be transferred from facility based care to community based care for achieving target weight gain of 15%, based on the following criteria :

- Child has completed antibiotic treatment
- Has good appetite (eating at least 120-130 cal/kg/day)
- Has good weight gain (of at least 5g/kg/day for three consecutive days) on exclusive oral feeding
- No oedema
- Caretakers sensitized to home care and education has been completed and Immunization is up-to-date

INFRASTRUCTURE

Nutritional rehabilitation centre/ Child Malnutrition Treatment Centre is a special unit, located in a health facility(District Hospital and Community Health Centre) and dedicated to the initial management and nutrition rehabilitation of children with severe acute malnutrition(SAM). Children are admitted as per the defined admission criteria and provided with medical and nutritional therapeutic care. At a district hospital/medical college hospital, the NRC would have 10-20 beds and at a FRU/CHC, the CMTC would have 6-10 beds. The unit should be a distinct area within the health facility and should be in proximity to the pediatric ward/inpatient facility.

The NRC/CMTC should have the following:

- **Patient area** to house the beds;adult beds are kept so that the mother can be with the child.
- **Play and counseling area** with toys; audiovisual equipment like TV, DVD player and IEC material
- **Nursing station**
- **Kitchen and food storage** area attached to ward, or partitioned in the ward, with enough space for cooking, feeding and demonstration.
- **Attached toilet and bathroom facility** for mothers and children along with two separate hand washing areas

The approximate covered area of the NRC should be about 150 square feet per bed, plus 30% for ancillary area. A 10 bedded unit should have a covered area of about 1950 square feet; this will include the patient area, play and counseling area, nursing station, kitchen, storage space, two bathrooms and two toilets.

NRC/CMTC should have a cheerful, stimulating environment; it should be child friendly. Walls can be brightly painted and decorated. Ward should have sufficient space for all mothers/caregivers staying with the children to sit together and be given cooking and feeding demonstration.

The following civil work is required:

- **Floor surfaces:** Floor surfaces should be easily cleanable and should minimize the growth of microorganisms.
- **Walls:** As with floors, the ease of cleaning and durability of wall surfaces must be considered.
- **Water supply:** Unit should have 24 hour uninterrupted running water supply.
- **Power supply:** Unit should have a 24 hour uninterrupted stabilized power supply.
- **Lighting:** Should be well lit.
- **Ventilation:** Should be adequately ventilated, especially for the kitchen area.
- **Mosquito and fly screen:** Windows should be covered with mosquito and fly covers

HUMAN RESOURCES

The suggested staff requirement for the smooth functioning of a 10 bedded NRC/CMTC is as follows:

Staff Position	Numbers for 10-bedded unit
Medical officer (In charge)	1
Staff nurse	2
Nutritionist(contractual)	1
Cook-cum-care taker (contractual)	2
Attendant/cleaner (contractual)	1
Medical social worker	1

- ❖ **Medical Officers, Nurses and Nutrition Counselor:** working in the NRC/CMTC should be trained in Facility Based Care of Severe Acute Malnutrition
- **Medical officer:** The Medical Officer (MO) should be a qualified medical doctor (MBBS) trained in Facility based management of SAM. Medical Officer will be the overall in-charge of the unit and will be responsible for clinical management of children admitted in the NRC. The MO will examine each patient every day and will attend to emergency calls as per the need.
- **Nurse:** The nurses will be responsible for nursing care including weight record; measure, mix and dispense feed; give oral drugs; supervise intra venous fluids; assess clinical signs and fill the multi chart with all the routine information. The nurse will also counsel mothers/caregivers on the emotional needs of her child and encourage them to give sensory stimulation.
- **Nutrition Counselor:** The will function as a supervisor of the unit; trainer and counselor for the staff posted in the NR C as well as mothers/caregivers. S/he will chart out specific therapeutic diet plan for each child as per the guidelines in consultation with the Medical Officer. S/he will also be responsible for monitoring the preparation and distribution of feeds as per diet charts, maintaining NR C records in registers, preparing reports of the NR C and in diet and treatment sheets.
- **Cook cum Care taker:** The cook cum care taker will prepare special diet for children as prescribed by the medical officer under the supervision of the Nutrition counselor. The cook will also involve mothers and care givers of admitted children in preparation of food.
- **Attendant/Cleaner:** The cleaners are responsible for managing the cleaning duties and the provision of detergents, hand soaps, chlorine etc. Floors should be cleaned every day with soap and water. Toilets should be disinfected with 0.5% active chlorine solution.

- **Medical Social Worker:** The medical social worker should make a social assessment of the family and the community in which the child lives. If needed, she will work together with the family to advise them on their eligibilities and social rights in order to improve their living situation and prevent further malnutrition and impoverishment. She can facilitate linkages with local Anganwadi, Public Distribution System and public welfare schemes as may be relevant to the child and the family.

EQUIPMENTS:

List of Equipments and Supplies at NRC/CMTC:

SNO.	ITEM	QUANTITY
1	Length board	1
2	Electronic weighing machine	1
3	MUAC tapes	2
4	Measuring cups and spoons	2 set
5	LPG connection and stove(4 burners)	1
6	Storage Tins for Kitchen	10
7	Feeding Utensils- Katori, Spoon, Plates, glasses	20
8	Cooking Utensils	
9	Geyser for bathroom	1
10	Refrigerator	1
11	Water purifier	1
12	Mixer	1
13	Room heater	1
14	Room thermometer	1
15	Digital thermometers	1
16	Cots, linen, mattresses, blankets	20
17	TV with DVD player	1
18	Toys for children	
19	Soft boards and white boards	

Some of the equipment needed in NRC/CMTC are available at the respective health facility (district hospital/CHC) and are mobilized from there, while supplies may be purchased as part of medicines and drug supply of the hospital.

KITCHEN SUPPLIES:

- Supply for making Starter and Catch up Diet
- Dried Skimmed Milk
- Whole dried milk
- Fresh whole milk
- Puffed rice
- Vegetable oil
- Foods similar to those used in home (for teaching/use in transition to home foods)

1.3Review of Literature

A study on “An Experience of Facility-based Management of Severe Acute Malnutrition in Children Aged Between 6-59 Months Adopting the World Health Organization Recommendations” by Manish maurya et.al gives us the evidence that Nutritional rehabilitation centers are effective in management of severe malnutrition. The recovery rate, death rate, defaulter rate, mean (SD) weight gain and mean (SD) duration of stay in the nutritional rehabilitation center were 68%, 2.2%, 4.4%, 13.0 (9.0) g/kg/d, 12.7 (6.8) days, respectively.⁽⁴⁾

“Can Nutrition Rehabilitation Centers Address Severe Malnutrition in India?” a study by Rajib Dasgupta et.al concludes limited success (marked by poor cure rates and high non-responder rates) to high prevalence of chronic malnutrition, particularly in nutritional rehabilitation centers located in peripheral areas. There is a failure to recognize severe chronic malnutrition as an epidemiological entity and gear wide-ranging programmatic and socialinterventions.⁽⁵⁾

A study on “What works? Interventions for maternal and child undernutrition and survival” by Zulfiqar A Bhutta et.al suggests that management of severe acute malnutrition according to WHO guidelines reduced the case-fatality rate by 55% (risk ratio 0.45, 0.32–0.62), and recent studies suggest that newer commodities, such as ready-to-use therapeutic foods, can be used to manage severe acute malnutrition in community settings.⁽⁶⁾

“Hospital Based Nutrition Rehabilitation of Severely Undernourished Children Using Energy Dense Local Foods” a study by Raja sriswan mamidi et.al suggests that the diet based on local energy dense foods was suitable for the nutrition rehabilitation of severely malnourished children though the rate of weight gain was moderate.⁽⁷⁾

A study on “Management of Children with Severe Acute Malnutrition: Experience of Nutrition Rehabilitation Centers in Uttar Pradesh, India” by K Singh et.al concludes that NRCs provide life-saving care for children with SAM; however, the protocols and therapeutic foods currently used need to be improved to ensure the full recovery of all children admitted.⁽⁸⁾

A study “To evaluate the effect of nutritional intervention measures on admitted children in selected NRCs of Indore and Ujjain divisions of the state of Madhya Pradesh” by Gunjan taneja et.al concludes that the NRCs were effective in improving the condition of admitted children, but the effects were not sustained following discharge due to high drop-out rate and lack of adequate parental awareness. There is an urgent need to link these centers with community-based models for follow-up and improve health education measures to maintain the gains achieved.⁽⁹⁾

“Treating severe acute malnutrition seriously” a study by Steve Collins concludes that achieving the fourth millennium development goal of a two third reduction in childhood mortality will not be possible if SAM is not addressed effectively. Cost-effective, high impact approaches now exist. In order for these to reach their potential, the treatment of SAM must become more central to the health care agendas in developing countries. Policy makers, health care funders and health professionals must accord SAM an importance and

urgency commensurate with its global significance as a leading cause of preventable childhood mortality and morbidity.⁽¹⁰⁾

1.4 Problem Statement

Poor availability and quality of services at NRC and CMTC can result in poor nutritional status of admitted children leading to an increased number of child deaths due to Severe Acute Malnutrition.

1.5 Rationale of the study

In India, the prevalence of Severe Acute Malnutrition (SAM) in children remains high despite overall economic growth. The National Family Health Survey-3 (2005-06) showed that prevalence of severe wasting is 6.4 percent among all children under-five years of age. SAM leads to growth retardation and impaired psychosocial and cognitive development. Undernourished children have significantly higher risk of mortality and morbidity.

To reduce morbidity and mortality among children with SAM, particularly those with medical complications, **facility based management** has been started with the objective to provide clinical management and to promote physical and psychosocial growth of these children. With appropriate nutritional and clinical management, many of the deaths due to severe wasting can be prevented.

Thus, this study was conducted to assess the availability of services at NRC/CMTC in terms of infrastructure, human resources and equipment and to study the output indicator to assess their performance in improving the nutritional status of admitted children.

1.6 Research Question

What is the effectiveness of facility-based care (NRC/CMTC) for children with severe acute malnutrition (SAM) in Tapi district, Gujarat?

1.7 Objectives

- To assess the availability of services at NRC and CMTCs in Tapi District in terms of infrastructure, human resources and equipment according to the Operational Guidelines on Facility Based Management of Children with Severe Acute Malnutrition (Ministry of Health and Family Welfare)
- To assess knowledge levels of staff (Nutritionist) regarding admission, feeding and discharge criteria of children with SAM.
- To study the output indicators of NRC and CMTCs to assess their performance in improving the nutritional status of admitted children.

1.8 Methodology

Study Design-Observational study (to assess NRC/CMTC based on checklist given by MoHFW) & descriptive cross sectional study (to assess the knowledge levels of Staff).

Study Area- 5 Blocks of Tapi district:

(1 NRC, 5CMTCs (one in each block)

Study Participants- Facility-based management staff

Data analysis plan- Filled interview schedule and record checked for completeness and correctness and data will be entered in MS Excel/SPSS for further analysis.

Data (information) to be collected-

- By Observation

- Facility Checklist Format (for assessment acc. to guidelines)
- Questionnaire to test knowledge of service provider
- Facility registers.

Data collection tools-

- Checklist
- Questionnaire

The present study was conducted in Six Facilities (one NRC at District Hospital and five CMTCs at CHC) located across 5 blocks in Tapi District from March 5, 2015 to May 5, 2015. The data of all the children with SAM admitted in the NRC/CMTCs from December to February, 2015 with all 3 follow-ups completed were analyzed retrospectively to assess their nutritional status during their 21 day stay and after three follow-up visits using anthropometric records. Weight at the time of admission and discharge and daily weights were recorded from the NRC/CMTCs registers; average weight gain was calculated to see if it was in accordance with the available guidelines.

Assessment of the facilities on the basis of availability of Infrastructure, Human resources and equipment was made through structured check lists, drawn up in accordance with the Operational Guidelines on Facility Based Management of Children with Severe Acute Malnutrition (Government of India). Interviews were held with the staff of the facilities to assess their knowledge regarding admission, feeding and discharge criteria.

1.9 Ethical Considerations

Informed consent will be taken before starting the interview. If anyone disagrees to become part of the data collection process, they will not be forced by any means. Prior information would be given before visiting any health facility. Purpose and objectives of the research will be explained before to the respondents. Names of Interviewees will not be taken in the research process and in the final presentation.

1.10 Results

1.10.1 Infrastructure

NRC functioning in the District Hospital and all 5 CMTCs in CHCs of respective blocks are 10 bedded units.

Physical facilities	NRC/CMTCs(n=6)	
	Number	Percentage
Separate patient area	6	100
Separate play and counseling area	6	100
Separate nursing station	0	0
Kitchen and food storage	6	100
Attached toilet and bathroom facility	4	66.6
Displays:		
All feeding and medicine panels, growth monitoring charts displayed	4	66.6
Data as per MPR and Quarterly Progress displayed	4	66.6
Bed side boards displayed with information of child	0	0
Cheerful and stimulating environment with walls brightly painted and decorated	4	66.6
24 hour uninterrupted running water supply	6	100
24 hour uninterrupted power	6	100
Well lit and adequately ventilated	6	100

Table 1.1: Distribution of health facilities on the basis of physical facilities and infrastructure

All the facilities had separate patient area, play and counseling area, kitchen and food storage area. Nursing station was absent in all the facilities. Attached toilet and bathroom facility was in 66.6% of the units. All units had 24-hour uninterrupted power and water supply with separate provisions of safe drinking water and were well lit and adequately ventilated. Feeding and medicine panel, bed side boards, data as per MPR and Quarterly progress was displayed in 66.6% of the facilities. (Table 1.1)

1.10.2 Human resources

STAFF	NRC/CMTCs(n=6)			
	Number	Percentage	Training status	Percentage
Medical officer	1	100	3	50
Staff nurse	2	100	0	0
Nutritionist	1	100	0	0
Cook cum care taker	2	100	-	
Attendant/cleaner	1	100	-	
Medical social worker	1	100	-	

Table 1.2: Distribution of health facilities on the basis of availability and training status of health personnel

All the facilities had adequate number of human resources according to the guidelines, but in terms of training status, only Three facilities (50%) had medical officers (MO's) who are trained in Facility Based Care of Severe Acute Malnutrition and no unit had staff nurse or nutritionist trained in SAM. Medical officer and staff nurse visits the facility on a regular basis and are available on-call if any emergency arises. Registers and Monthly Progress Report and Quarterly Progress Report were maintained by the nutritionist according to the given format from NRHM. (Table 1.2)

1.10.3 Equipment and Supplies

- All the facilities were well-equipped according to the guidelines, with only Geyser and Room thermometer lacking in all the facilities.
- Pharmacy supplies were purchased as part of medicines and drug supply of the District hospital and CHCs.
- Kitchen supplies were in kept in adequate stock.

1.10.4 Knowledge levels of staff (Nutritionist) regarding admission, feeding and discharge criteria of SAM children

Nutritionists of the facilities were interviewed and their knowledge level was found to be adequate. All of them gave the correct answers of all the questions asked related to admission criteria, F-75 and F-100 diets and discharge criteria.

1.10.5 Output indicators of NRC and CMTCs

A total of 107 children were admitted in the facilities during the study period. The mean age (SD) of the patients was 28.01 months with 39.2% of the children in the age group of 13-24 months. Fifty-eight percent of the admitted children (107) were girls. A majority of the admitted children belonged to Scheduled Tribes (88%) and 90% was below poverty line (BPL). (Table 1.3)

		Number (%)
Children admitted		107
Gender	Male	45(42.1)
	Female	62(57.9)
Child age(months)	6-12	14(13.08)
	13-24	42(39.2)

	25-36	16(15.0)
	37-48	23(21.5)
	49-59	12(11.2)
Caste	General	13(12.1)
	ST	94(87.9)
Category	APL	11(10.3)
	BPL	96(89.7)

Table 1.3: Socio-demographic profile of the admitted children (n=107)

1.10.5.1 Analysis of the admitted children based on weight

A total of 100 children were included in the analysis: 42 boys and 58 girls were analyzed for effect of nutritional interventional measures on weight gain. Seven children (3 boys and 4 girls) were excluded from the analysis as they did not stay at the centers for the entire duration of 14 days. Of them, two children were referred and five children dropped out. The overall mean weight of admission for these children was 7.7620 kg. The mean weight of discharge for the study group was 8.08 kg. At the time of discharge, 65 percent of the children had shown increase in weight compared to their admission weight. Children were typically admitted for 21 days and discharged (on the 21st day) irrespective of their attaining/not attaining target weights.

Only 12 percent of the children had achieved target weight gain of 15% after 21 days and only 13 percent of the children who had come for third follow-up visit(n=84) had attained the target weight gain. There was no death reported in any of the facility.

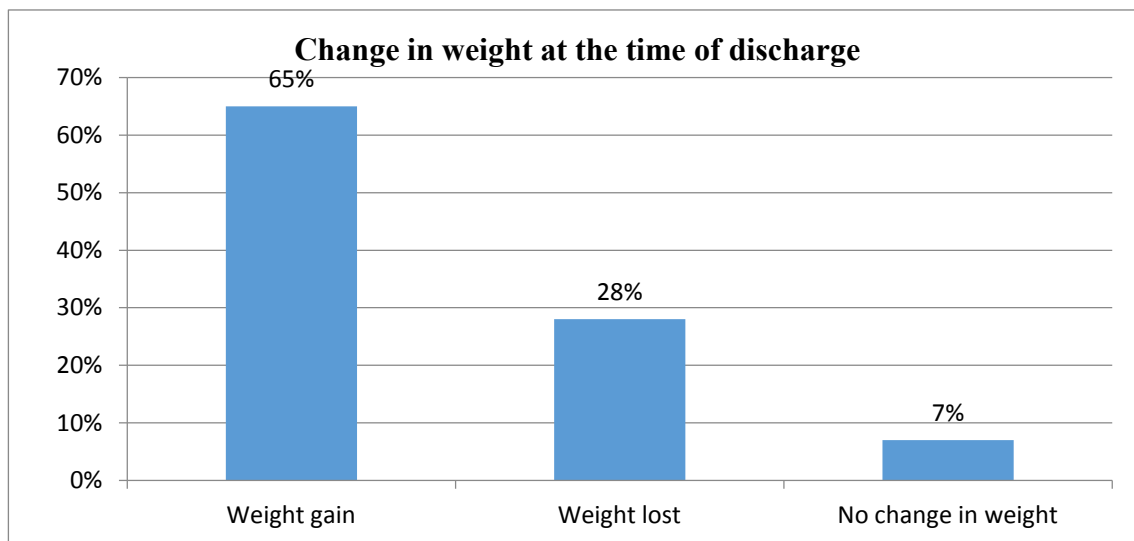


Figure 1.1: Percentage of children with weight changes at time of discharge (n=100)

1.10.5.2 Duration of stay at the NRC/CMTCs

The average stay in NRC/CMTC should be at least 15 days (but can be longer), depending on each child's medical recovery. However the child requires follow up for another 4-6 months for full recovery, depending upon the child's progress at home. Therefore parent/caregivers must be prepared for discharge and follow up.

Ninety-three percent of the children in the study group had stayed at the facilities for at least 15 days and 6.5% of the children stayed for less than 15 days. (Figure 1.2)

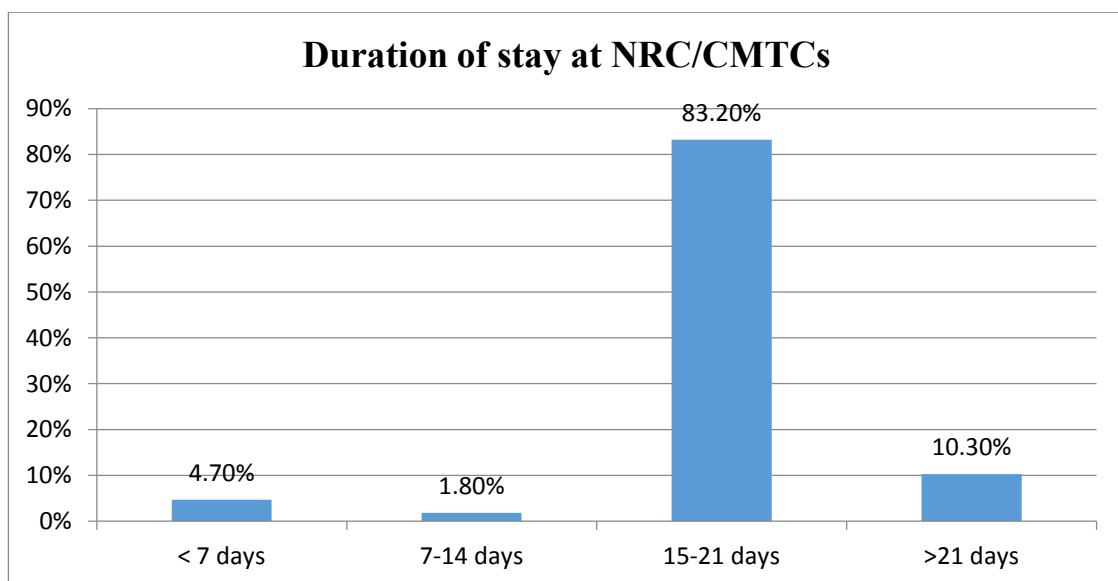


Figure 1.2: Duration of stay at NRC/CMTCs (n=100)

1.10.5.3 Analysis of follow-up data

Children discharged from NRC/CMTCs have to come for three follow-up visits to get their health check-up done and weight recorded. If their weight is not increasing and some problem is suspected, doctor is being consulted and visit/s can be made earlier or more frequently until the problem is resolved.

As per the standard guidelines, schedule of the follow up visits is as follows.

First visit – 15 days from the discharge

Second visit – 15 days from the first visit

Third visit – 30 days from the second visit

In the first follow-up, there was a drop-out rate of 5%, followed by a drop-out rate of 4.2% and 7.7% in the second and third follow-up visits respectively. (Figure 1.3)

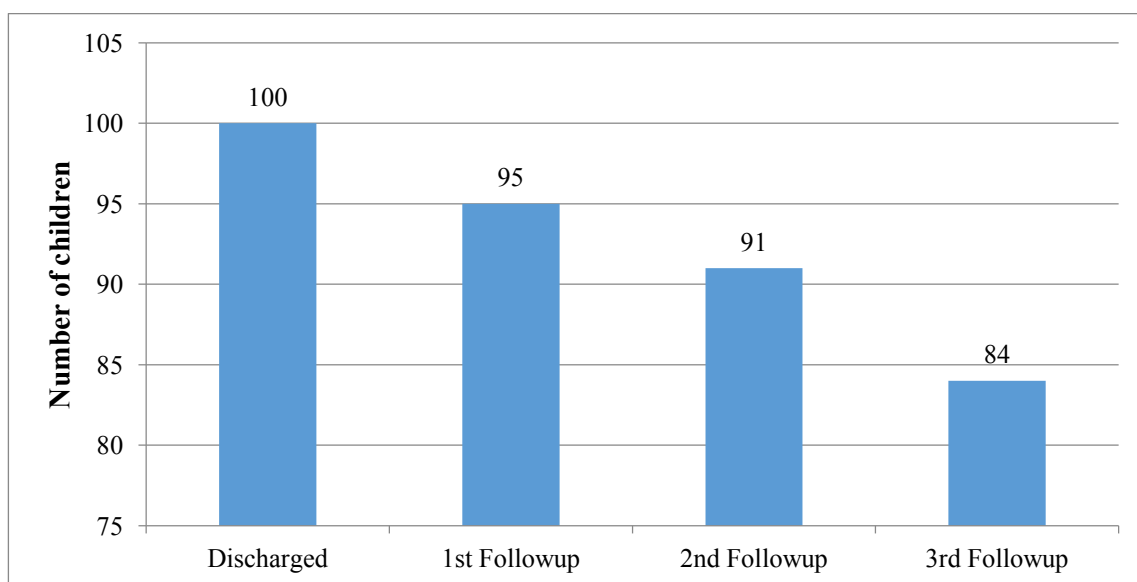


Figure 1.3: Number of children coming for follow-up visits (n=100)

AGE	1 st FOLLOW UP			2 ND FOLLOW UP			3 rd FOLLOW UP		
	YES	NO	TOTAL	YES	NO	TOTAL	YES	NO	TOTAL
6-12	11	3	14	11	3	14	10	4	14
13-24	35	2	37	33	4	37	30	7	37
25-36	16	0	16	16	0	16	14	2	16
37-48	23	0	23	23	0	23	21	2	23
49-59	10	0	10	8	2	10	9	1	10
Dropout rates at each follow up visit		5%(5)	100		4.2%(4)	95		7.7%(7)	91

Table: 1.4 Age-wise distributions of children at the different follow-ups

Out of 95 children in the first follow-up visit, 55 percent had lost weight, whereas 28 percent had gained weight and around 17 percent had shown no change in weight compared to their weights at the time of discharge. (Figure 1.4)

In the second follow-up visit, out of 91 children, 53 percent had lost weight, whereas around 39 percent had gained weight and around 9 percent had no change in weight compared to their weights at first follow-up visits. (Figure 1.5)

Of the 84 percent of the children who had come for third-follow-up visit, around 51 percent had gained weight, whereas around 39 percent had lost weight and 11 percent had shown no changes in weight compared to their weights in second follow-up visits. (Figure 1.6)

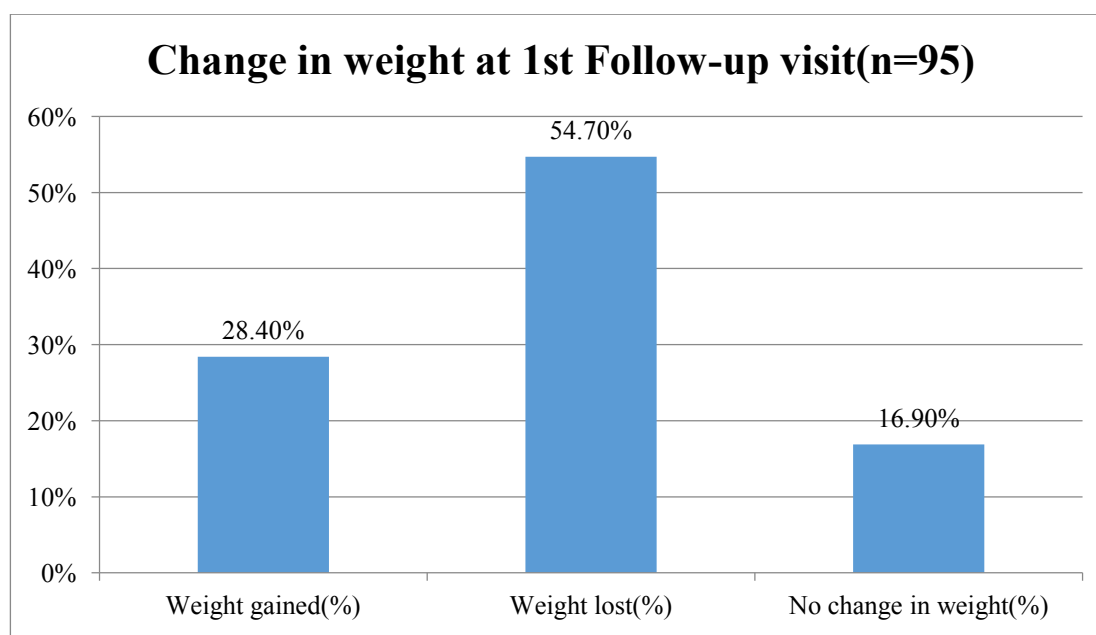


Figure 1.4: Percentage of children with changes in weight at first follow-up (n=95)

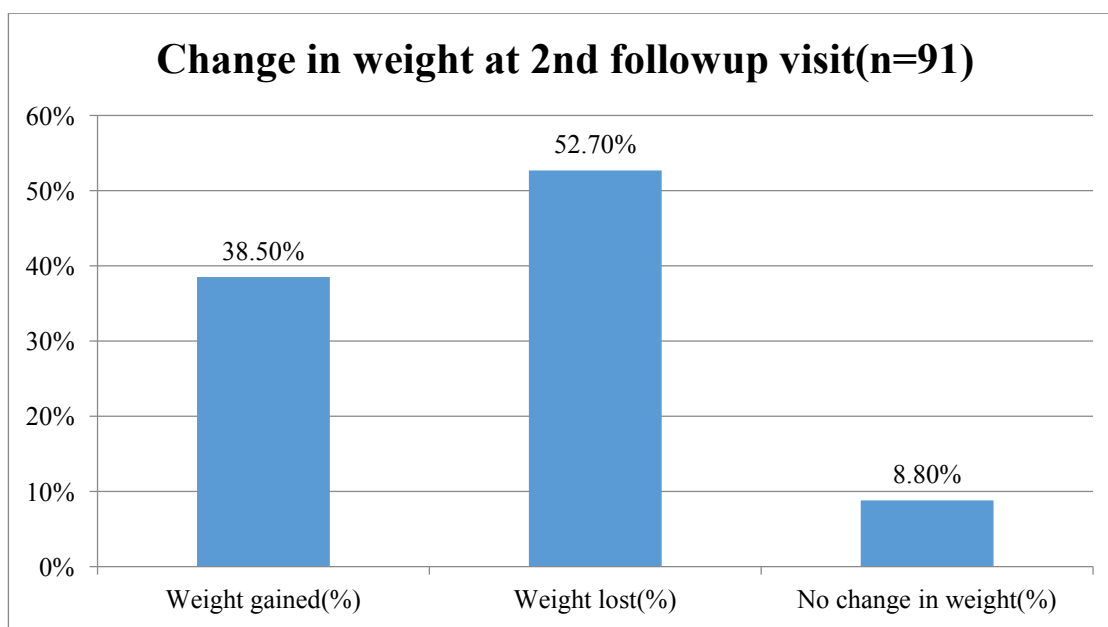


Figure 1.5: Percentage of children with changes in weight at Second follow-up (n=91)

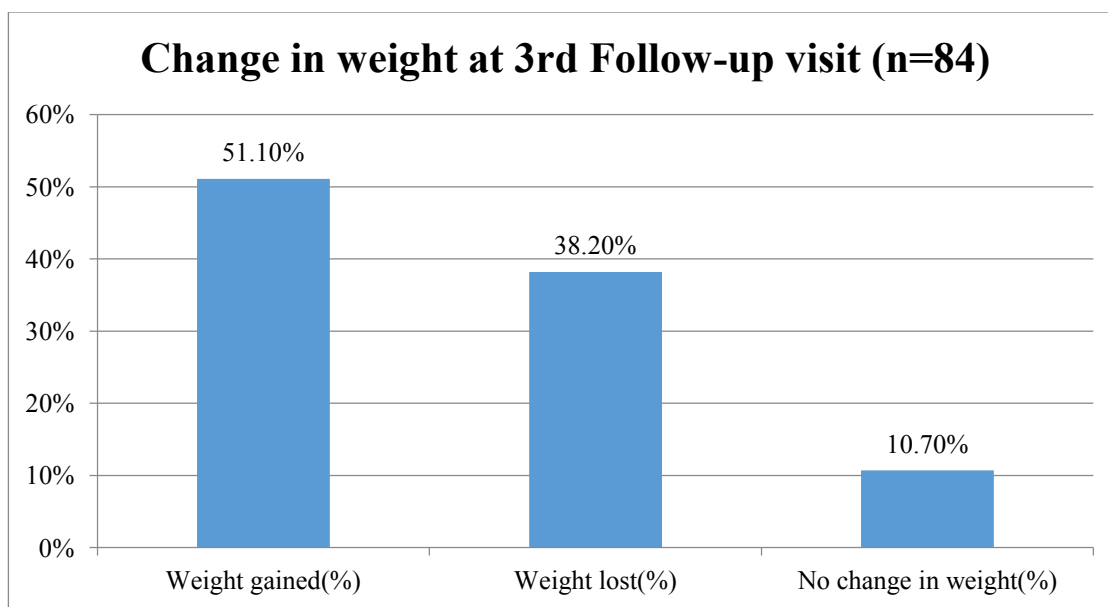


Figure 1.6: Percentage of children with changes in weight at third follow-up (n=84)

Results show that after three follow-up visits, almost half of the children discharged from the NRC\CMTCs had gained weight, rest had either lost weight or there was no change in weight at all.

1.11 Discussion

The objective of this facility-based cross-sectional study which was conducted for 2 months at 1 nutritional rehabilitation centre (NRC) and 5 child malnutrition treatment centers (CMTC) in Tapi district of Gujarat was to assess their effectiveness in improving the nutritional status of malnourished children. Assessment was done based on the availability of services in terms of infrastructure, human resources and equipment according to the Operational Guidelines on Facility Based Management of Children with Severe Acute Malnutrition (Ministry of Health and Family Welfare).

All the facilities had separate patient area, play and counseling area, kitchen and food storage area. Nursing station was absent in all the facilities. Attached toilet and bathroom facility was in 66.6% of the units. All units had 24-hour uninterrupted power and water supply with separate provisions of safe drinking water and were well lit and adequately ventilated. Feeding and medicine panel, bed side boards, data as per MPR and Quarterly progress was displayed in 66.6% of the facilities.

All the facilities had adequate number of human resources according to the guidelines, but in terms of training status, only Three facilities (50%) had medical officers (MO's) who were trained in Facility Based Care of Severe Acute Malnutrition and no unit had staff nurse or nutritionist trained in SAM. Medical officer and staff nurse visits the facility on a regular basis and are available on-call if any emergency arises. Registers and Monthly Progress Report and Quarterly Progress Report were maintained by the nutritionist according to the given format from NRHM.

All the facilities were well-equipped according to the guidelines, with only Geyser and Room thermometer lacking in all the facilities. Pharmacy supplies were purchased as part of medicines and drug supply of the District hospital and CHCs. Kitchen supplies were in kept in adequate stock.

Nutritionists of the facilities were interviewed and their knowledge level was found to be adequate. Hundred percent of the nutritionist gave the correct answers of all the questions asked related to admission criteria, F-75 and F-100 diets and discharge criteria.

Data of 107 children with SAM aged between 6-59 months admitted in NRC and CMTCs during December, 2014 to February 2015 was analyzed retrospectively. Admission and Discharge criteria were according to the Operational Guidelines on Facility Based Management of Children with SAM given by Ministry of Health and Family welfare.

A total of 107 children were admitted in the facilities during the study period. The mean age (SD) of the patients was 28.01 months with 39.2% of the children in the age group of 13-24 months. Fifty-eight percent of the admitted children (107) were girls. A majority of the admitted children belonged to Scheduled Tribes (88%) and 90% was below poverty line (BPL).

A total of 100 children were included in the analysis: 42 boys and 58 girls were analyzed for effect of nutritional interventional measures on weight gain. Seven children (3 boys and 4 girls) were excluded from the analysis as they did not stay at the centers for the entire duration of 14 days. Of them, two children were referred and five children dropped out. The overall mean weight of admission for these children was 7.7620 kg. The mean weight of discharge for the study group was 8.08 kg. At the time of discharge, 65 percent of the children had shown increase in weight compared to their admission weight.

Children were typically admitted for 21 days and discharged (on the 21st day) irrespective of their attaining/not attaining target weights. Only 12 percent of the children had achieved target weight gain of 15% after 21 days and only 13 percent of the children who had come for third follow-up visit(n=84) had attained the target weight gain. There was no death reported in any of the facility

Ninety-three percent of the children in the study group had stayed at the facilities for at least 15 days and 6.5% of the children stayed for less than 15 days.

In the first follow-up, there was a drop-out rate of 5%, followed by a drop-out rate of 4.2% and 7.7% in the second and third follow-up visits respectively. Out of 95 children in the

first follow-up visit, 55 percent had lost weight, whereas 28 percent had gained weight and around 17 percent had shown no change in weight compared to their weights at the time of discharge. In the second follow-up visit, out of 91 children, 53 percent had lost weight, whereas around 39 percent had gained weight and around 9 percent had no change in weight compared to their weights at first follow-up visits. Of the 84 percent of the children who had come for third-follow-up visit, around 51 percent had gained weight, whereas around 39 percent had lost weight and 11 percent had shown no changes in weight compared to their weights in second follow-up visits.

Results show that after three follow-up visits, almost half of the children discharged from the NRC\CMTCs had gained weight, rest had either lost weight or there was no change in weight at all.

1.12 Conclusion

The study aimed to assess the overall functioning of the NRC\CMTC and their effectiveness in improving the nutritional status of admitted children. It is evident from results and discussion that these facilities have adequate infrastructure, equipment and knowledgeable staff and are effective in improving the condition of admitted children demonstrated by high survival rates, but there is low recovery rate (weight gain < 15%) and effects are not sustained following discharge. There is a dropout rate in follow up visits and almost half of the children lose weight after being discharged. This may be due to lack of parental awareness and dietary practices followed in tribal area.

There is an urgent need to link these facilities with community-based models for follow-up and improve nutrition counseling to maintain the weight gain achieved and protocols and therapeutic foods currently used need to be improved to ensure the full recovery of all children admitted.

1.13 Limitations of the Study

- Time constraints for various activities of the project.
- Language barrier acts as hurdle for data collection

1.14 References

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4. Manisha Maurya, DK Singh, Ruchi Rai, PC Mishra and Anubha Srivastava. *An Experience of Facility-based Management of Severe Acute Malnutrition in Children Aged Between 6-59 Months Adopting the World Health Organization Recommendations*
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2 Annexure

2.1 Facility Assessment Checklist

Name of the facility: _____

Type of facility(NRC/CMTC)_____

Mark Tick “√” for availability and mark cross “×” for unavailability.

Infrastructure:

S. No.	Infrastructure	Response	Remarks
1	Is there a separate patient area in the facility		
2	Is there a separate play and counseling area		
3	Is there a separate nursing station		
4	Is there a separate Kitchen and food storage area		
5	Is there an attached toilet and bathroom facility		
6	Is there availability of 24 hour uninterrupted running water in the facility?		
7	Is there availability of 24hour uninterrupted power supply		
8	All feeding and medicine panels, growth monitoring charts displayed are displayed in NRC/CMTC?		
9	Is Data as per MPR and Quarterly Progress displayed?		
10	Bed side boards displayed with information of child?		
11	Cheerful and stimulating environment with walls brightly painted		

	and decorated		
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Equipment:

SNO.	ITEM	QUANTITY	AVAILABLE	UNAVAILABLE
1	Length board	1		
2	Electronic weighing machine	1		
3	MUAC tapes	2		
4	Measuring cups and spoons	2 set		
5	LPG connection and stove(4 burners)	1		
6	Storage Tins for Kitchen	10		
7	Feeding Utensils- Katori, Spoon, Plates, glasses	20		
8	Cooking Utensils			
9	Geyser for bathroom	1		
10	Refrigerator	1		
11	Water purifier	1		
12	Mixer	1		
13	Room heater	1		
14	Room thermometer	1		
15	Digital thermometers	1		
16	Cots, linen, mattresses, blankets	20		
17	TV with DVD player	1		
18	Toys for children			
19	MIS Register, SAM charts,			

	Admission, Discharge and Follow up Cards ,transfer slips			
20	Soft boards and white boards			

Human Resource:

S. No.	Designation	Number	Remark
1	Medical Officer	1	
2	Staff nurse	2	
3	Nutritionist	1	
4	Cook cum care taker	2	
5	Attendant/cleaner	1	
6	Medical social worker	1	

Training Status of Staff:

S. No.	Designation	Facility based care of SAM	Remark
1	Medical officer		
2	Staff nurse		
3	Nutritionist		

2.2 Questionnaire to assess Staff Knowledge regarding Admission, Feeding and Discharge Criteria

Informed Consent: I would like to thank you for taking the time to meet me. My name is Dr. Chetna Chaudhary. I am from ICDS, Tapi.

I would greatly appreciate your participation in this survey.

I would like to ask you some questions about your knowledge on Management of children with Severe Acute Malnutrition. The interview should take about 10 minutes. Information you provide will be kept strictly confidential and used only for research.

Participation in survey is voluntary. If you choose to participate, you may withdraw at any time. However we hope that you will take part in this interview since your participation is important. You don't have to talk about anything that you don't want to and you can end the interview at any time.

Do you have any questions about what I just explained?

Are you willing to participate in the interview?

Start time: _____

End time: _____

Instruction Manual for Questionnaire:

- Ask the questions in their language.
- Instructions for marking responses are mentioned in front of each question.

Questions:

Q. No.	Questions	Coding Categories		Instruction	Response
1	What is your name?				
2	What is your Age?			Write in completed years	
3	Since how long are you working as Nutritionist?			Write in completed years	
4	What is your highest Educational level?				
5	Have you received any training in Facility-based management of SAM children?	Yes	1		
		No	2		
6	What should be the minimum weight of a normal Baby at birth?	3000gms	1	In case of 99 please specify	
		2500gms	2		
		2000gms	3		
		Don't know	98		
		Other	99		
7	Weight for height indicates:	Underweight	1		
		Stunting	2		
		Wasting	3		
		Don't know	98		
		others	99		
8	Children with SAM have MUAC:	Greater than 115 mm	1	In case of 99 please specify	
		Equal to 115 mm	2		
		Less than 115 mm	3		
		Don't know	98		

		Other	99		
		Incorrect	2		
9	Children with SAM have z-score	Less than -3SD of the median WHO child growth standards	1	In case of 99 please specify	
		Less than -2SD	2		
		More than -3 SD	3		
		More than -2SD	4		
		Don't know	98		
		Other	99		
10	What is WHO recommended F-75?	Starter diet	1		
		Catch up diet	2		
11	F-75 diet provides:	75kcal/100ml energy	1	In case of 99 please specify	
		75g/100 ml protein	2		
		75g/100 ml lactose			
		Don't Know	98		
		Other	99		
12	F-75 diet is:	Low in sodium and protein	1		
		Low in carbohydrate	2		
		High in sodium and protein	3		
		Don't know	98		
		others	99		
13	F-100 diet is:	High in calories	1		

		and proteins			
		Low in calories and proteins	2		
		Don't know	98		
		others	99		
14	According to you when one should initiate breastfeeding to a newborn child?	1 hr after delivery	1	In case of 99 please specify	
		2 hr after delivery	2		
		24 hrs after delivery	3		
		As soon as possible after delivery	4		
		Don't know	98		
		Other	99		
		No	2		
15	Please tell me what is Exclusive breastfeeding?	Only breast milk till 6 months	1	In case of 99 please specify	
		Water & breast milk till 6 months	2		
		Prelacteals can be given alongwith breast milk till 6 months	3		
		Don't know	98		
		Other	99		
16	When should the child be discharged	Edema has resolved	1		
		Child has achieved weight gain of >15%	2		
		All infections and	3		

		medical complications have been treated.			
		Child is eating an adequate amount of nutritious food	4		
		All of the above	5		
		Don't know	98		
		others	99		

THANK YOU