

Study on Assessing the Performance of Child Malnutrition and Treatment Center in Banaskantha, Gujarat

By

Nabin Kumar Patra

*Dissertation submitted for the partial fulfillment of the
MBA Hospital and Health Management*

Academic year, 2016-2018



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TO WHOMSOEVER MAY CONCERN

This is to certify that **Nabin Kumar Patra** of MBA Hospital and Health Management from The IIHMR University, Jaipur has undergone internship training **National Health Mission, Gujarat** from **1st Feb 2018 to 1st May 2018**.

The Candidate has successfully carried out the study designated to his during internship training and his approach to the study has been sincere, scientific and analytical. The Internship is in fulfillment of the course requirements.

I wish him all success in all his future endeavors.



Dr (Col) Ashok Kaushik

Dean, Academics and Student Affairs

The IIHMR University, Jaipur



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Assistant Professor

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No.DPN/Health/NHM/ Certi/ /2018
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Date: - 10/05/2018.

To Whomsoever It May Concern

The certificate is awarded to

Nabin Kumar Patra

In recognition of having successfully completed his

Internship in the department of

Reproductive and Child Health

and has successfully completed his Project on

**A study on assessing the performance and quality of Child Malnutrition and Treatment Centre in
Banaskantha, Gujarat**

Duration of Study - 5th February to 04th May 2018

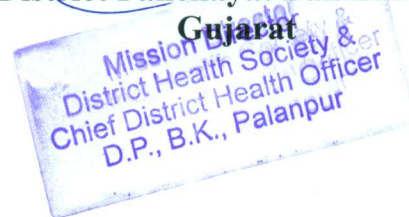
Organization- National Health Mission, Gujarat Dept.

He comes across as a committed, sincere & diligent person who has a strong drive and zeal for learning

We wish him all the best for future endeavours

**Date: -10/05/2018.
Place: -Palanpur**

**Chief District Health Officer
District Panchayat Banaskantha
Gujarat**



THE IIHMR UNIVERSITY, JAIPUR

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **A study on assessing the performance of Child Malnutrition and Treatment Center in Banaskantha, Gujarat** submitted by **Nabin Kumar Patra**, Enrollment No.-0449, under the supervision of **Dr. Ranjan Kumar Prusty** for award of MBA in Hospital and Health Management of the University carried out during the period from **1st February 2018** to **1st May 2018** 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

ACKNOWLEDGEMENT

The opportunity of doing my dissertation Report with **National Health Mission, Gujarat** was a great chance for learning and professional development. I consider myself as a very lucky individual as I was provided with an opportunity to be a part of it. I am also grateful for having a chance to meet so many wonderful people and professionals who led me through this Dissertation period.

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I perceive this opportunity as a big milestone in my career development. I will strive to use gained skills and knowledge in the best possible way, and I will continue to work on in order to attain desired career objectives.

Sincerely

Nabin Kumar Patra

IIHMR University, Jaipur

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List of Abbreviation

AWW	Anganwadi Worker
ASHA	Accredited Social Health Activist
F- IMNCI	Facility Based Integrated Management of Newborn and Childhood Illness
IV	Intravenous
IU	International Unit
HFA	Height for Age
WFA	Weight for Age
WFH	Weight for Height
WFL	Weight for Length
MUAC	Mid Upper Arm Circumference.
VCNC	Village Child Nutrition Center (Bal Shaktim Kendra)
CMTC	Child Malnutrition Treatment Center (Bal Sewa Kendra)
NRC	Nutrition Rehabilitation Center (Bal Sanjeevani Kendra)
SAM	Severe Acute Malnutrition
SD	Standard Deviation
NFHS	National Family Health Survey
RBSK	Rashtriya Bal Suraksha Karyakram

Executive Summary

Background: Malnutrition, as a major public health and nutrition challenge faced by many developing countries, stands as a consequence of several key social and economic factors such as lack of education, inadequate health care services and ill-informed cultural behaviors.(1) Particularly India holds the dubious distinction of being the birthplace of a third of the world's entire population of malnourished children. As per the data shown in National Family Health Survey 2015-16 of Banaskantha district of Gujarat it looks quite evident that even after the establishment of 3 tier approach for integrated management of malnutrition, Severe Acute Malnutrition is still prevalent in the district i.e. almost 9% of the total children.

Objectives: To assess the performance of Child Malnutrition and Treatment Centre with respect to its key output indicator i.e.

- Stay at CMTC
- Total Weight Gain
- Outcome

Methodology: A follow up prospective study was conducted at 14 Child Malnutrition and Treatment Centre of Banaskantha, Gujarat where 72 children were admitted during the entire month of February, 2018. These SAM children were then followed up till the period of their 3rd follow up. The main source of data collection were slightly modified pre structured monthly follow up report. In this report their socio- demographic details and anthropometric measurement were recorded.

Results: Majority of Severely Acute Malnourished Children (SAM) children belong to age group less than 2 years i.e. (37.5%) most of the admitted children belonged from the OBC (Other Backward Class) (41.6%), SC (Scheduled Caste) (33.33%) and ST (Scheduled Tribe) (18%) and General Category (7%) respectively. ASHAs (Accredited Social Health Activists) are playing key role in referring them to CMTC. Death rate was 0%, cure (recovery) rate 65%, defaulter rate 8.33%, mean length of stay (days) at CMTC was 15 and mean weight gain was 10.36g/kg/day.

Performance indicators are significantly affected by length of stay at CMTC. Follow up gradually declined from 1st follow up to 3rd follow up

Conclusion: This study makes us realize the importance of engagement of field level staff in active screening of SAM children. For this happen, it is necessary to strengthen our screening processes, both in the community and facility level. The inefficacy of RBSK mobile team in screening the SAM children depicts the poor surveillance. There is a need to develop effective supervision and monitoring of RBSK team to strengthen the screening process of SAM children. The low indicator values of recovery rate and high non-respondent rate reflects the inadequacy of the treatment method offered at the facility level. To address this issue operational guidelines given by NHM Gujarat should be religiously followed to ensure correct formulation and timely administration of feeds.

3. Dissertation Report

**A study on assessing the performance of Child
Malnutrition and Treatment Centre in
Banaskantha, Gujarat.**

Project Guide:

Dr. Mukesh H. Trivedi, RCH Officer

District Health Society, Banaskantha

2.1 Background

Introduction

India is one among the many countries where child malnutrition is severe and also malnutrition is a major underlying cause of child mortality in the country. Malnutrition, as a major public health and nutrition challenge faced by many developing countries, stands as a consequence of several key social and economic factors such as lack of education, inadequate health care services and ill-informed cultural behaviors(1).

Globally, it is estimated that there are nearly 20 million children who are severely acutely malnourished(2,3). India holds the dubious distinction of being the birthplace of a third of the world's entire population of malnourished children. Around 29.1 percent of India's children are underweight, 38.4 percent are stunted and 21 percent of children are wasted as per NFHS-2015-16. Particularly in Banaskantha, Gujarat where 43 percent of children are undernourished 40 percent are wasted, 20 percent are stunted and nearly 8.5 percent of the children are severely wasted, which is quite an alarming situation(4).

Nutritional Status of Children

Variable	India	Gujarat	Banaskantha
Children under 5 years who are stunted (height-for-age)	38.4	38.5	40.7
Children under 5 years who are wasted (weight-for-height)	21.0	26.4	21.6
Children under 5 years who are severely wasted (weight-for-height)	7.5	9.5	8.5
Children under 5 years who are underweight (weight-for-age)	29.1	39.3	43.1

Table 2.1 Comparison of Nutritional Status of Children in India, Gujarat and Banaskantha Source: NFHS-2015-16

A number of state governments have taken the lead and are in the process of scaling up the establishment of Child Malnutrition and Treatment Center (CMTC) with the intention to improve the quality of care being provided to children with Severe Acute Malnutrition (SAM) and to reduce child mortality.

Child Malnutrition and Treatment Centre 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 CMTC, the child continues to be in the Nutrition Rehabilitation program till she/he attains the defined discharge criteria from the program(5).

In addition to curative care, special focus is given on timely, adequate and appropriate feeding for children; and on improving the skills of mothers and caregivers on complete age appropriate caring and feeding practices. In addition, efforts are made to build the capacity of mothers/caregivers through counseling and support to identify the nutrition and health problems in their child.

Objectives of CMTC

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

2.1.1Anthropometric Measurement

Anthropometric measurements are used to assess the size, shape and composition of the human body. Anthropometric measurement is important examination because it determines whether the child falls under the SAM protocol or not. Anthropometric data includes:

- Weight
- Length
- Mid Upper Arm Circumference
- Weight by length or height

As per the protocol the if the MUAC of a child is less than 11.5 cm then it falls under the SAM protocol similarly in child growth standard prepared by WHO if the child falls under more than - 3 standard deviation then the child fall under the SAM category.

2.1.2 Three Tier Approach for treatment of malnutrition in Gujarat

Gujarat model of Malnutrition management has adopted 3 tier approach. Child Malnutrition Treatment Centre also known as Bal Sewa Kendra is 2nd tier of approach to malnutrition providing care at sub-district or block level health centers. Children with SAM, SUW and Serious growth faltering with one or more of the conditions like infection/ loss of appetite/ bilateral pitting oedema on legs are beneficiaries of Bal Sewa Kendra and shall be treated as indoor cases for minimum 21 days. This strategy is a state adaptation and differs from Govt. of India guidelines for institutional management of malnutrition which is focused on SAM children only(6).

The Village Child Nutrition Center as "Bal Shaktim Kendra" at Anganwadi centers for malnourished children without any medical needs.

- Under this program malnourished children without any medical needs are enrolled in the VCNC center for 30 working days were they are provided 5 times supervised diet + 2 times home diets in addition to micronutrient supplementation and medicines.

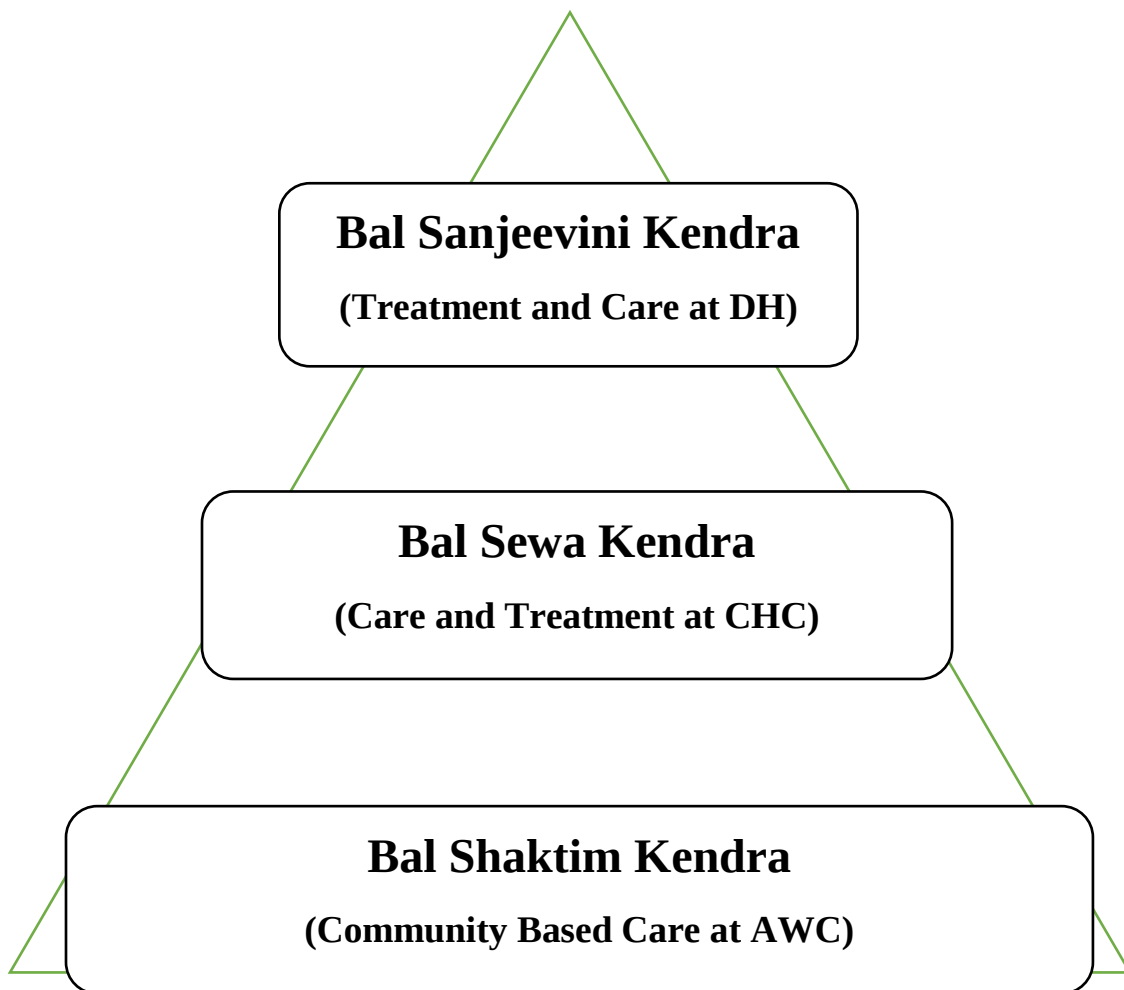


Fig 2.1 Show the three tier approach for treatment against Malnutrition

The Child Malnutrition Treatment Center as "Bal Sewa Kendra" at PHC/CHC/ Sub District level for malnourished children needing some medical care.

- Under this program malnourished children with some medical needs are enrolled residentially in the CHC/ Sub District level hospital 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

Nutrition Rehabilitation Center as "Bal Sanjeevani Kendra" at District Hospital/ Medical College for malnourished children with significant medical care.

- Under this program malnourished children with significant medical needs are enrolled residentially in the District level hospital or Medical College for 21-25 working days were 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.

2.1.3 Services Provided at Bal Sewa Kendra (CMTC)

“Under this program malnourished children with some medical needs are enrolled residentially in the CHC/ Sub District level hospital for 21 working days were 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(5).

Following are the services provided at CMTC

- Cases referred from Bal Shaktim Kendra.
- Indoor case discharge after 21 days of Management
- OPD Cases with Severe Malnutrition with Infection/Oedema
- OPD cases with Severe Malnutrition without infection/Oedema

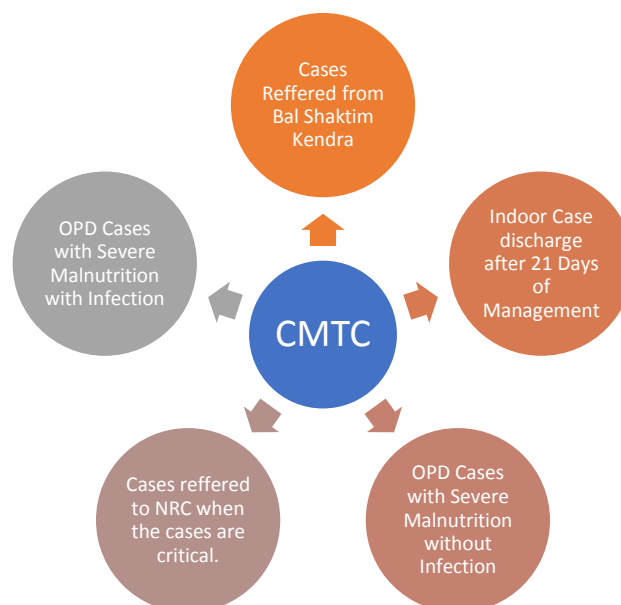


Fig 2.2 Services Provided at Bal Sewa Kendra (CMTC)

2.1.4 Acceptable Level of Care at CMTC

Performance of CMTCs may be assessed based on the criteria described below. All excess mortality should always be investigated. Lessons learned could save a number of lives; analysis of reports could point out to the need for training of the staff and help change the entrenched practices. The overall functioning of the CMTCs can be monitored against the sphere standards(1,5).

Element	Quality Characteristic	Standard	Indicator
Recovery Rate (at follow up)	Satisfactory	More than 75% beneficiaries recovered	It is the Percentage of beneficiaries who have reached the discharge standards (target should be achieved within 3 rd follow up period
Death Rate	Negligible	Less than 5% beneficiaries died	It is the percentage of children who died within the reporting period in CMTC
Defaulter Rate	Minimal	< 15% beneficiaries have defaulted	Percentage of children that have not attended the CMTC for 3 consecutive days

Average Weight Gain	Proportionate	$\geq 8\text{gm}$ is the average weight gain of all the beneficiaries	Sum of weight gains (g/kg/day) of all the children discharge during the month
Length of stay	Optimal	2-4 week is the average length of stay for all the beneficiaries	Total inpatient day of care i.e. sum of each daily inpatient census for the time period examined.
Medical Transfer Rate	Minimal	$< 15\%$ is transferred due to medical complication	Percentage of children who were transfer to medical facility outside the feeding program.
Non Respondent Rate	Negligible	$< 10\%$ beneficiaries failed to respond to treatment	Percentage of patient who fails to respond to treatment

Table 2.2 showing the acceptable level of care at CMTC

2.2 Literature Review

In this study Shakila Mull and Pankaj kumar Gupta states that success of MTC depends upon duration of child stay. If the duration is adequate, MTC gets the opportunity to take appropriate actions for improving child's health condition. In this study, 47% admitted children did not stay for adequate duration (minimum 7 days) at MTC. About 30% children stayed for just one day, half of them because of referral and remaining because of caretaker's unwillingness. These 30% children proved as major hurdle in success of MTC in terms of performance indicators. This factor, 'stay at MTC' was found to have positive correlation with total weight gain by children statistically. Again this factor showed very highly significant impact on outcome of SAM children. Thus, importance of duration of stay at MTC is very well proved in the study(3).

This analysis was conducted at the chosen NRC of Ujjain and Indore, Madhya Pradesh conducted by Taneja along with his group. Within this research weight was accepted as the principal anthropometric step as an advancement in burden of acute malnourished children has the most important impact in reducing the mortality. The research findings show a statistically significant difference between the average weight at release and the average weight at entrance for the whole study group ($t=14.552$, $P<0.001$) and for boys ($t=9.904$, $P<0.001$) and women individually ($t=10.745$, $P<0.001$). Which imply that the remain at Child Malnutrition and therapy center plays a Significant Role in increasing the burden of SAM kids given that they remain for sufficient days in CMTC .

In another study done by Dr. G. Peter Paul and Dr. M. Siva Durga Nayak Prasad at one of the NRC in Andhra Pradesh at Ongle District. In this paper they had studied the effect of nutritional intervention in undernourished children at NRC. Basic information and all the anthropometric measures like weight, length, weight by length or height were recorded at the time of admission and discharge. Since it was an observational study they found out that NRC plays a significant role in curbing down the malnutrition by providing nutritional intervention to the children(7).

The study done by Oana Mărginean, Ana Maria Pitea, Septimiu Voidăzan, Claudiu Mărginean aimed at describing the prevalence of malnutrition in a cohort of hospitalized children at an academic hospital in Romania and to evaluate the ability of the STRONGkids screening tool to identify malnutrition risk in this population. In their study they found out the prevalence of the malnutrition to be 37% which significantly higher than the other developed countries. They suggested the prevalence of malnutrition was high due to difference in socio-economic factors(8).

Another study done by Arun Kumar Arya, Pavika Lal, Pramod Kumar on Co-morbidities in Children with Severe Acute Malnutrition. They prospective hospital based study done in the Department of Pediatrics, GSVM Medical College, Kanpur, from January 2014 to December 2015. They carried out the study on 200 SAM diagnosed children on the basis of WHO classification. They found out that there is strong co relation of morbidity with Severe Acute Malnutrition. The most common co- morbidity was acute gastroenteritis (36.5%) followed by acute respiratory tract infections (26.5%). Tuberculosis was also present in 21.5% cases Anemia was present in 95% cases. 25% children had clinical features of rickets and 12% had vitamin A deficiency(9).

A qualitative study conducted by Collins et.al demonstrated that NRC's cannot be the only tool to combat malnutrition; the study results shows that the NRC's have had a positive impact on the selected anthropometric indicators of severe malnourished children but lag behind the educational aspect and ensuring proper follow up visit. Linking of NRC's with community based core model of management of severe malnourished children needs to be put into place as soon as possible(10).

Lastly, in addition to these performance indicators, the social status and economic profile of children admitted to NRC have also been analyzed by many researcher. A study conducted by IIPS, Mumbai showed that a major proportion of the admitted children belonged to the marginalized population group. The findings are in accordance with that of NFHS-III, which states that children belonging to SC,ST and OBC and that those with illiterate mothers have the highest rate of malnutrition(11).

2.3 Research Methodology

2.3.1 Research Question

What is the performance compliance of the Child Malnutrition and Treatment center in Banaskantha, Gujarat?

2.3.2 Rationale for the Study

As per the data shown in National Family Health Survey 2015-16 of Banaskantha district of Gujarat it looks quite evident that even after the establishment of 3 tier approach for integrated management of malnutrition, Severe Acute Malnutrition is still prevalent in the district i.e. almost 9% of the total children.

Since its inception in 2013, supportive supervision and monitoring of all CMTC in Banaskantha district has been executed only through monthly and quarterly report comprising of linelisted beneficiaries showing clinical and nutritional status improvement.

A performance assessment of all the key indicator i.e. (stay at CMTC, Total weight gain and Outcome) will enable an effective and comprehensive evaluation of all the facilities. At the same time it will help district/state program manager to address the technical gaps in a better way.

2.3.3 Objective of the Study

The overall aim of the dissertation is to assess the performance of Child Malnutrition and Treatment Centre with respect to its key output indicator i.e.

- Stay at MTC
- Total Weight Gain
- Outcome

2.3.4 Study Design

The study design was follow up prospective study design wherein 72 children were recruited from 14 CMTC during the month of February, 2018 and then followed up till their 3rd follow up.

All the anthropometric measures were recorded in the questionnaire. Weight at the time of admission and discharge was noted to check whether the child has achieved 15 percent of the total weight gain.

2.3.5 Study Location and Duration

The study was conducted at each CMTC located across 14 blocks of the district from February, 2018 to April 2018. At the time of initiating this study Banaskantha has 14 CMTC and all were functional.

2.3.6 Data Collection

Main source of Data information is primary by using pre-existing monthly follow up report with slight modification to meet the study's objective. The additional modification information is given in Annexure- A .Data were then collected by me with the help of Nutrition Assistant in CMTC.

Basic details like age in months, gender, caste (SC, ST, General, OBC and some other tribe who were not included in ST) and referral by whom (ASHA, ANM, RBSK Team) were recorded in the questionnaire.

2.3.7 Sample Size

Total 72 children between the age group of 2-59 months were admitted during the month of February and then followed up till their 3rd follow up. As per the protocol the admission criteria in Banaskantha district is different from other district in Gujarat. In other district the admission criteria is 6-59 months with any of the (all the children registered in CMTC during february were considered)

- MUAC <11.5 cm with medical complications and or Appetite test Fail
- W/L < -3 SD with medical complication and or Appetite test Fail
- Presence of bilateral pitting oedema

Whereas, in Banaskantha there is a provision to admit even 2 month child at CMTC.

2.3.8 Sampling Technique

Total Sampling method was used as all the children admitted to CMTC during 1 February-28 February were included in the study.

2.3.9 Compilation of Data

The data was first compiled at the facility level by the District Programme Coordinator from each block then compiled at the district for the data analysis. The data was then entered in Microsoft Excel 2013. Descriptive statistic was then used to tabulate the observed data. Analytical statistic Pearson's correlation Coefficient is used to compare observed data with expected data to obtain according to specific hypothesis.

2.4 Results

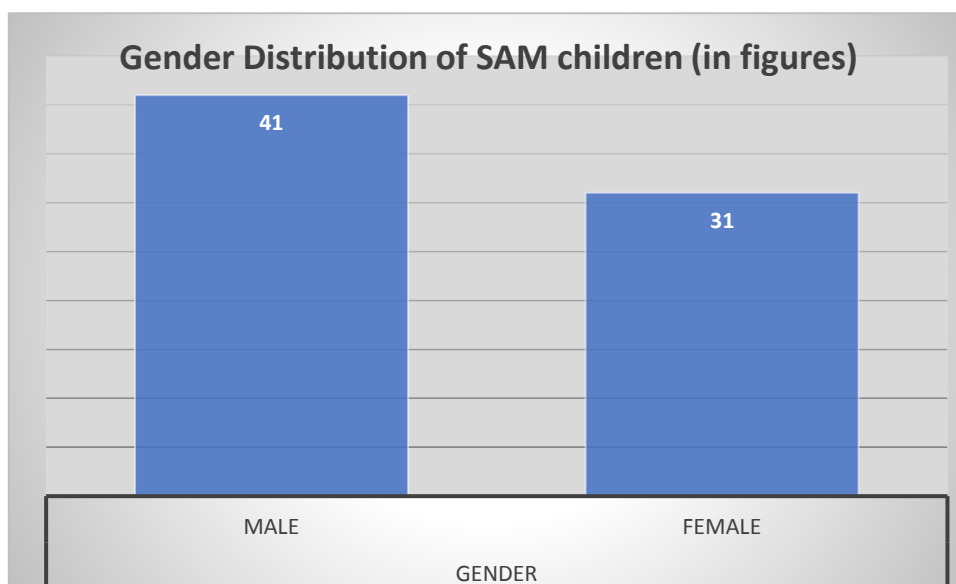
Total 72 SAM children were enrolled during the month of February, 2018 and then followed up till their 3rd follow up. Particulars of these children including socio-demographic profile.

Variables	Categories	Distribution	
		Number	Percentage
Age Group	2- 12 months	27	38
	13-24 months	25	35
	25-36 months	12	17
	37-48 months	7	10
	49-60 months	1	1
Gender	Male	41	57
	Female	31	43
Caste	General	5	7
	Scheduled Caste	24	33
	Scheduled Tribe	13	18
	Others	30	42
Referred by	ASHA	35	49
	ANM	3	4
	Others; OPD, Pediatrics Ward, RBSK	34	47

Table 2.3 socio-demographic profile of SAM Children are shown

From the observation it can be easily noted out that maximum no. of SAM children were from the age group 2-12 (38%) months followed by the 13-24 group (35%). 45-60 age group had the least (1%) admitted in the CMTC under the SAM Protocol.

2.4.1 Admission in CMTC during study period (Gender Distribution)



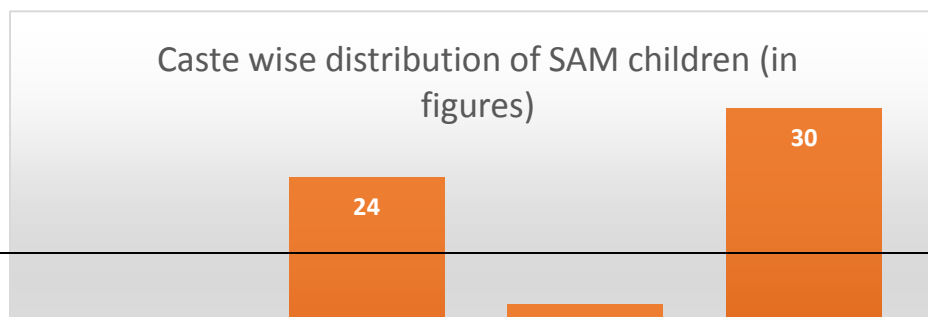
Graph 2.1 Gender Distribution during CMTC admission

During the study period 41 male child and 31 female child were admitted in the CMTC under the SAM protocol.

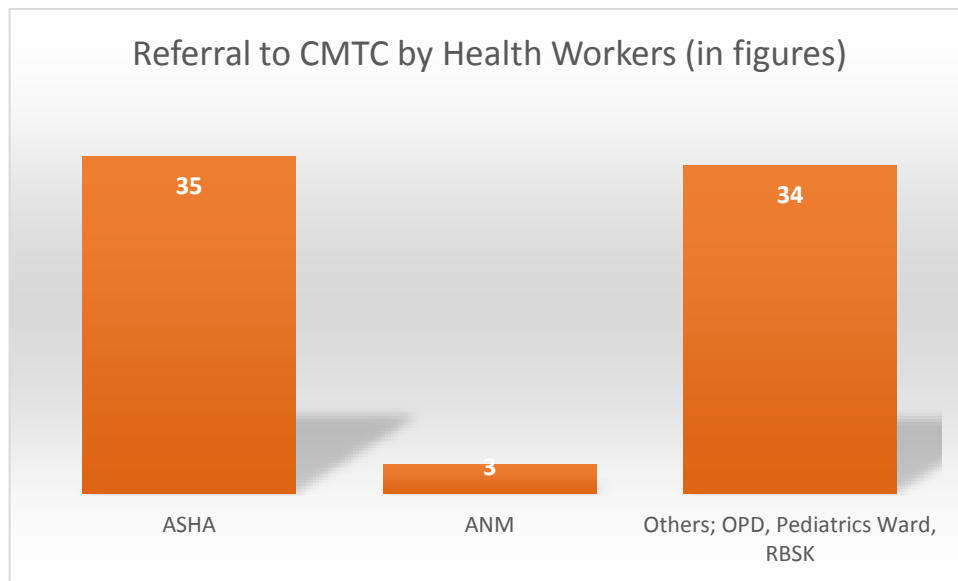
2.4.2 Caste Wise Distribution in CMTC Admission

In the graph below majority of the children belonged to the other group i.e. 30 followed by the children of Scheduled Caste (24) Scheduled Tribe (13) and General (5).

Graph 2.2 Caste wise distribution during CMTC admission



3.4.3 Referred to CMTC by



Graph 2.3 No. of Children Referred by ASHA, ANM and others

Surprisingly majority of the referral of the SAM children to the CMTC is done by the ASHA i.e. (35 Children) Followed by others such as RBSK teams, OPD, Pediatrics Wards. Only a handful of children were referred by ANM showing poor performance.

2.4.4 Performance of Child Malnutrition and Treatment Centre

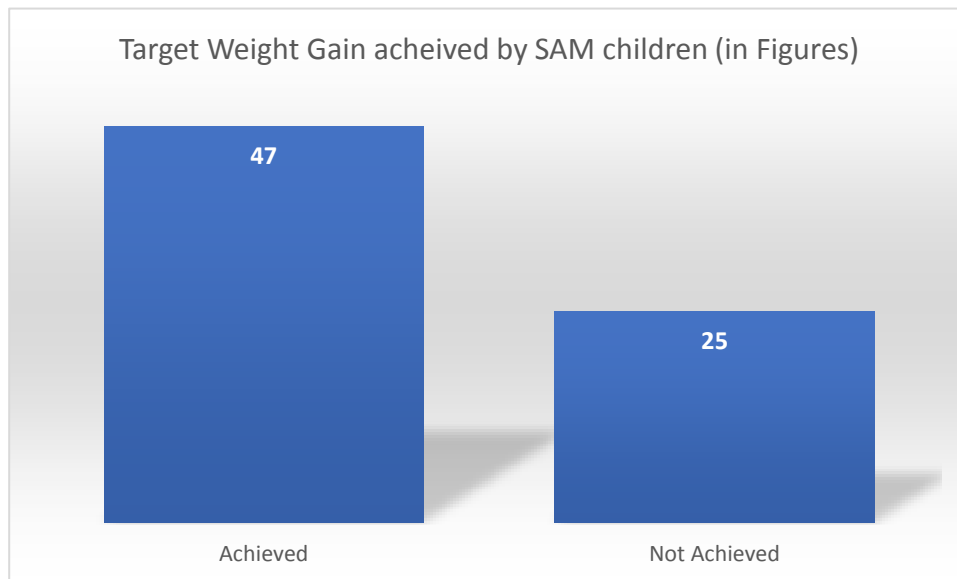
The performance of the Child Malnutrition and Treatment Centre can be found by following variables:

- **Target Weight Gain**

- Stay in CMTC
- Outcome

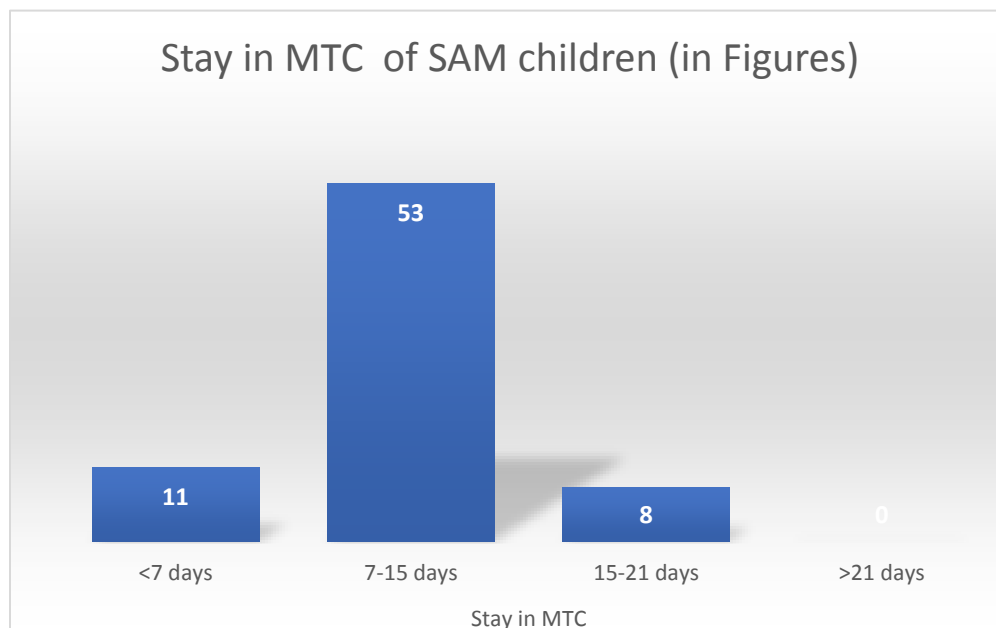
2.4.4.1 Target weight Gain during stay in CMTC

From graph 3.4 we can clearly depicts that out of 72 children 47 children achieved their target weight and rest did not. As per the acceptable level of indicator it is just below average but quite good in comparison to other district.



Graph 2.4 Target weight of the children during stay in CMTC

2.4.4.2 Stay in MTC

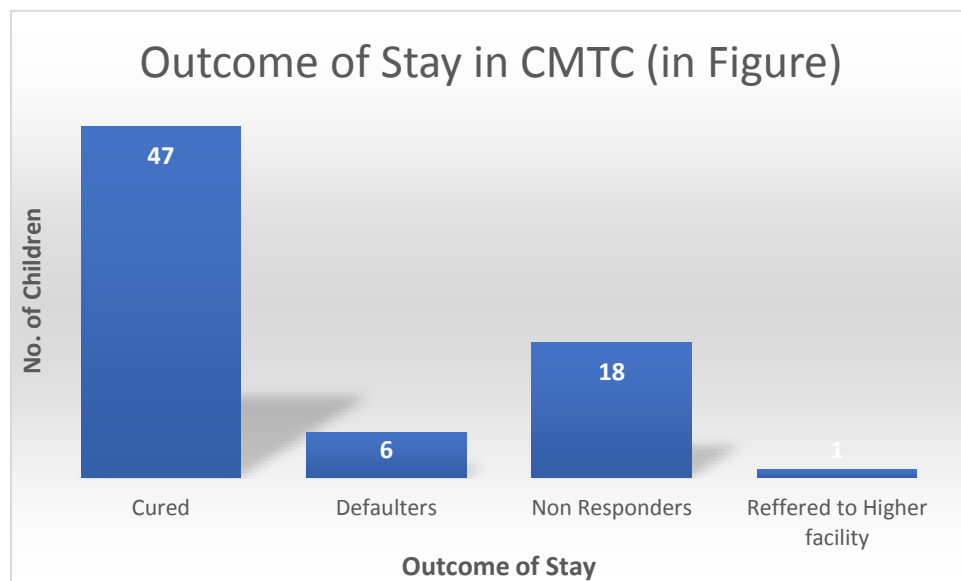


Graph 2.5 shows the Duration of stay in CMTC by SAM Children

Majority of the SAM children i.e. 61 stayed in CMTC as per the protocol and only 11 children stayed less than 7 days in the CMTC.

2.4.4.3 Outcome

Outcome of stay in CMTC is quite positive. Out of 72 children, 47 children were cured after their 3rd follow up. Only 6 children were defaulters, 18 Non responders and 1 children was referred to higher facility.



Graph 2.6 Showing results of Outcome of stay in CMTC

To summarize the output indicator in the study one of the positive output was death rate which was 0%. 47 children i.e. 65 % was the recovery which was well below the minimum acceptable

level. 18 children were non respondent and 6 were defaulters during the entire study. Only 1 children was referred to the higher facility due to complication

Element	Standard	Output	Remarks
Recovery Rate (at follow up)	> 75% beneficiaries recovered	65.2%	The recovery rate as per the guideline is poor in comparison to other district the result is very good.
Death Rate	< 5% beneficiaries died	0%	CMTC has successfully averted the death rate of malnourished children
Defaulter Rate	< 15% beneficiaries have defaulted	8.33	Defaulter rate is good as it meets the standard criteria
Average Weight Gain	≥ 8gm is the average weight gain of all the beneficiaries	10.36	Average weight gain is also very good and well above the standard guideline.
Length of stay	1-4 week is the average length of stay for all the beneficiaries	16 approximately 2 weeks	The length of stay in CMTC is also very good.
Medical Transfer Rate	< 15% is transferred due to medical complication	1%	Merely one percent were referred to medical facility.
Non Respondent Rate	< 10 % beneficiaries failed to respond to treatment	25%	The non-respondent rate is very poor as one fourth of the children failed to respond to the treatment.

Table 2.4 showing the performance output of each indicator

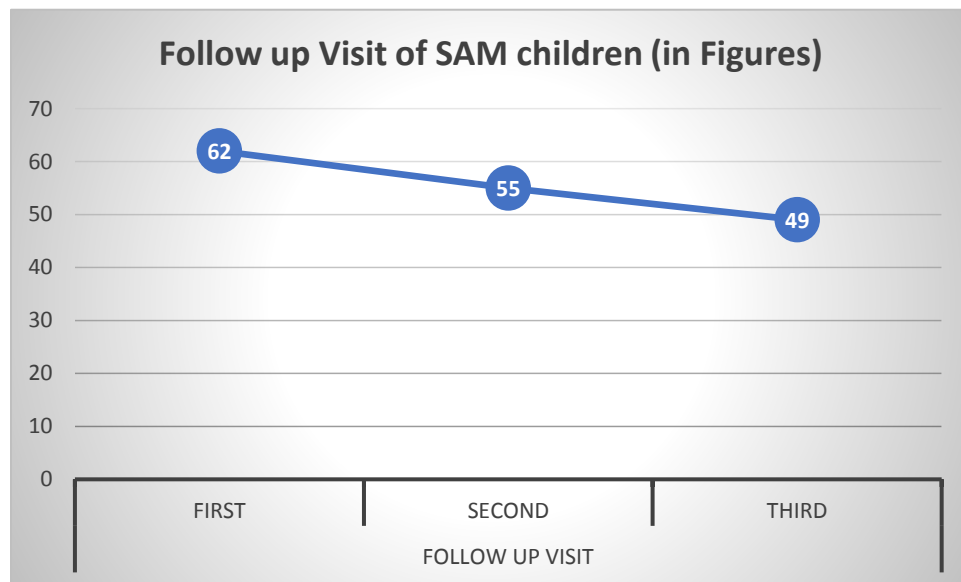
2.4.4.4 Correlation between stay at Child Malnutrition and Treatment Centre and Total weight gain.

Variables	Mean	Standard Deviation	Number
Stay at CMTC	16.45	3.86	72
Total Weight Gain	10.36	5.18	72

Table 2.5 Shows the Pearson's Correlation Coefficient (r) = 0.46

Pearson's Correlation Coefficient was used to measure how strong the relationship is between the two variables. When the degree of the Correlation was measured between stay at Child Malnutrition and Treatment Centre and Total Weight gain it was moderately positive between the two variables.

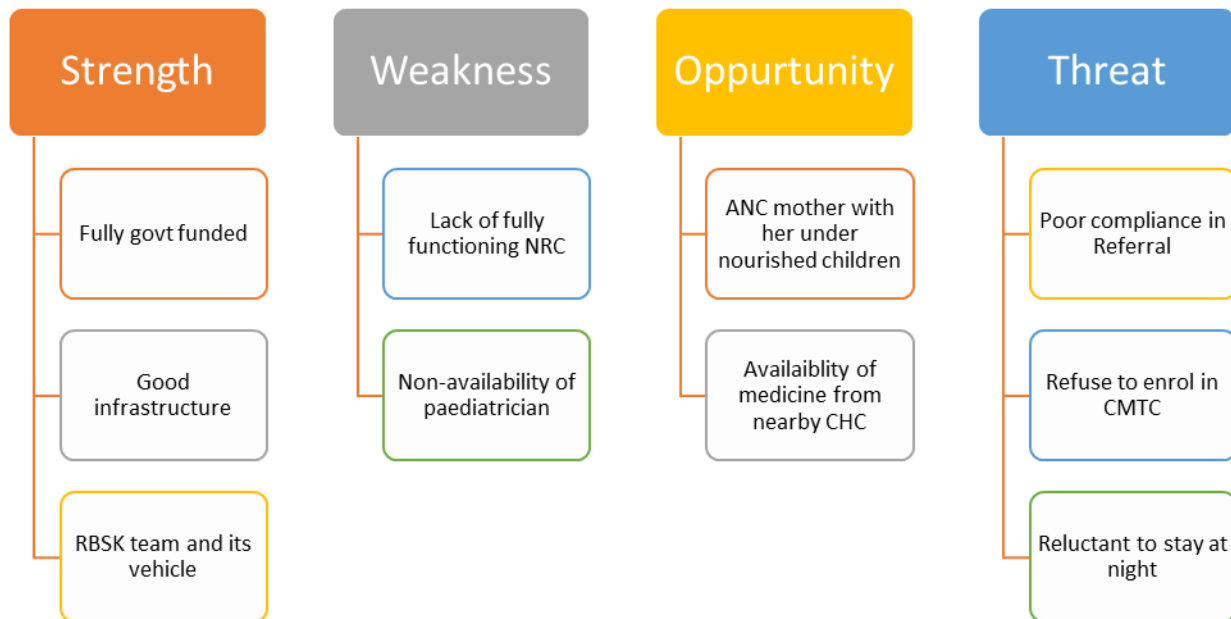
2.4.4.5 Trend of follow up of children after discharge from CMTC



Graph 2.7 Showing no. of follow up with each visit.

It can be clearly depict from the graph 2.7 that there has been a continuous dip in the in each successive follow up.

2.5 SWOT Analysis of CMTC Performance



Strength

- **RBSK Team**

RBSK team consisting of AYUSH doctor is used in screening of malnourished children. If they felt need, child is referred to CMTC. Nutritionist at CMTC further screen child by doing anthropometry, appetite test and examination for oedema. If child comes under the inclusion criteria of CMTC then only, he/she is enrolled.

- **Infrastructure**

All the CMTC in each district has a proper infrastructure in their respective block. Almost all of them have adequate space for patient room, counseling area, kitchen and food storage facilities. All the other necessary equipment were also available.

- **Government Funded**

Since all the nutritional program are funded by similarly CMTC are also funded by government which means beneficiary has to pay no extra charges and wage losses of caretaker is compensated by government in form of incentives.

Weakness

- **Lack of fully functioning NRC**

Out many refer cases to CMTC some of the cases needs serious medical attention and need to be handled by tertiary level of care. However, lack of fully functioning NRC or non-availability of pediatrician add no value to the cases.

Opportunity

- **ANC mother with her undernourished children**

ANC mother visit with her malnourished children can be used as an opportunity to the strengthen the perform/mance of CMTC. Apart from counselling on feeding practices and food habits she receives nutritious food along with her child.

Threats

- **Night stay at CMTC**

Night stay at CMTC ensures 21 days of supervised diet to the child but it is not possible in village/tribal areas due to social customs which do not allow a woman to stay out of home at night.

- **Refusal**

Although nutritionist is very enthusiastic for assistance to the SAM children but many mothers totally refuse to be enrolled at CMTC.

2.6 Discussion

The study findings demonstrate that a significant proportion of those admitted children belonged to this marginalized population groups. The findings are in accordance with that of NFHS-IV, which states that children belonging to the SC, ST, and OBC and children whose mothers are

illiterate have the highest rates of malnutrition(4). Role of ASHA was dramatic in the current study, who have proved to be an important link between health centers and the community(3).

In terms of performance of all the CMTC in each block only death rate and defaulter rate fall in the category of 'Acceptable' outcome as per operational guidelines for facility-based management of SAM children. The recovery rate of the children is 65 % which is less than the acceptable level of care as per the protocol. The average weight gain of the children was 10.36g/kg/day which is above the level of care at CMTC.

The median length of stay in the centers had been 16 days, which is a lot less than earlier programmes for children with intense Protein Energy Malnutrition (vary from 6 months to 8 weeks). The brief period of stay not just reduces costs but also reduces the absence of mother from their houses which has significant implications at the society level. Effectively, the term of stay has to be balanced between the odds of cross-exposure to disease as well as also the willingness of their moms to effectively handle their kids in the home.

It is quite evident from the study that we've been successful in reducing death rate in SAM children although we haven't not much succeeded in reducing morbidity of the SAM children. The death rate in facility-based managed SAM children has been reported to be declining over years according to various studies. One study conducted on malnourished kids in the calendar year 2006 reported passing rate as 12.9% (7). Another Indian study printed in year 2014 detected death rate of 2.2% at CMTC. Which shows that there has been significant improvement in the quality of care provided at CMTC to the SAM Children.

When children get discharge from CMTC after staying for recommended period of time, the parents or the caretaker have to visit the CMTC for 3 times for follow up. . The incentives were payable to ASHA for accompanying the child for follow up visit In spite of this fact in this study we have seen a gradual decrease in the rate of first follow up to 3rd follow up.

2.6 Conclusion

There's not any doubt that CMTC can play an extremely vital part in lessening the burden of mortality and morbidity related to Malnutrition locally, given active screening and immediate therapy is performed nicely. So, at the first place it is necessary to strengthen our SAM screening process both at the community and the facility level. Along with ASHA, ANM, RBSK teams and Block Health visitor involve in active screening of SAM children then we can effectively increase the screening of SAM children. Therefore, it is necessary to frequently sensitize the field health workers regarding the program and educate them.

After the screening and prompt referral of SAM children are being done it is necessary to develop the effective regulation at the community and the facility level. The “low” output indicator values of recovery rate and high non-respondent rate reflects the lack of the treatment method offered at the facility level. Since it indicates that the plausible treatment which was given to the children wasn't given as per the protocol. Also, there was lack of supervision from the Nutrition Assistant who job responsibility is to monitor the health and growth of the children.

The authorities have the power to bring the transformation as well as the key policy makers should take keen interest in developing innovative approaches to address various barriers and challenges affecting successful implementation of the program at CMTC. At the same time they should be actively involved in solving the managerial issues related to finance and human resource that often go unnoticed and neglected.

Thus, in conclusion we can say that with consolidated efforts from all the key stakeholders at various level of healthcare system, CMTC can be established as an effective intervention to curb the menace of Malnutrition and its associated complication.

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Annexure- A

Template for the Data Collection

Performance Assessment of Child Malnutrition and Treatment

Centre, Banaskantha Gujarat

1. Background Information

Name: _____ Age: _____ Sex: _____

Father's Name: _____ Mother's Name: _____

Religion: _____ Caste: _____ APL/BPL Family: _____

2. Status of Child on Admission

1. Admission Date:
2. Type of Admission:
3. Referred by:
4. Weight during admission:
5. MUAC of child on admission:

6. Length of a child (in cm):
7. W/L-H of child during admission:
8. Presence of Oedema:
9. Any Complication during admission:
10. Appetite Test: Pass ☐ Fail ☐

3. Status of child on Discharge

1. Discharge Date:
2. Weight during discharge:
3. MUAC of child on discharge:
4. Length of a child during discharge (in cm):
5. W/L-H of child during discharge:
6. Presence of Oedema:
7. Any Complication during discharge:

4. Follow up Visit Details:

Variables	Follow up- 1	Follow up- 2	Follow up-2
Weight (kg)			
MUAC (in cm)			
Length of a child (cm)			
Weight by Length/ Height			
Presence of Oedema			
Any illness or complication			

5. Additional Details

1. Total Duration of Stay:
2. Total Weight Gain:
3. Average Weight Gain:g/kg/day

Annexure- B

Weight for Length Reference Card

ANNEX 1

Weight-for-Length Reference Card (below 87 cm)

Boys' weight (kg)					Length	Girls' weight (kg)				
-4 SD	-3 SD	-2 SD	-1 SD	Median	(cm)	Median	-1 SD	-2 SD	-3 SD	-4 SD
1.7	1.9	2.0	2.2	2.4	45	2.5	2.3	2.1	1.9	1.7
1.8	2.0	2.2	2.4	2.6	46	2.6	2.4	2.2	2.0	1.9
2.0	2.1	2.3	2.5	2.8	47	2.8	2.6	2.4	2.2	2.0
2.1	2.3	2.5	2.7	2.9	48	3.0	2.7	2.5	2.3	2.1
2.2	2.4	2.6	2.9	3.1	49	3.2	2.9	2.6	2.4	2.2
2.4	2.6	2.8	3.0	3.3	50	3.4	3.1	2.8	2.6	2.4
2.5	2.7	3.0	3.2	3.5	51	3.6	3.3	3.0	2.8	2.5
2.7	2.9	3.2	3.5	3.8	52	3.8	3.5	3.2	2.9	2.7
2.9	3.1	3.4	3.7	4.0	53	4.0	3.7	3.4	3.1	2.8
3.1	3.3	3.6	3.9	4.3	54	4.3	3.9	3.6	3.3	3.0
3.3	3.6	3.8	4.2	4.5	55	4.5	4.2	3.8	3.5	3.2
3.5	3.8	4.1	4.4	4.8	56	4.8	4.4	4.0	3.7	3.4
3.7	4.0	4.3	4.7	5.1	57	5.1	4.6	4.3	3.9	3.6
3.9	4.3	4.6	5.0	5.4	58	5.4	4.9	4.5	4.1	3.8
4.1	4.5	4.8	5.3	5.7	59	5.6	5.1	4.7	4.3	3.9
4.3	4.7	5.1	5.5	6.0	60	5.9	5.4	4.9	4.5	4.1
4.5	4.9	5.3	5.8	6.3	61	6.1	5.6	5.1	4.7	4.3
4.7	5.1	5.6	6.0	6.5	62	6.4	5.8	5.3	4.9	4.5
4.9	5.3	5.8	6.2	6.8	63	6.6	6.0	5.5	5.1	4.7
5.1	5.5	6.0	6.5	7.0	64	6.9	6.3	5.7	5.3	4.8
5.3	5.7	6.2	6.7	7.3	65	7.1	6.5	5.9	5.5	5.0
5.5	5.9	6.4	6.9	7.5	66	7.3	6.7	6.1	5.6	5.1
5.6	6.1	6.6	7.1	7.7	67	7.5	6.9	6.3	5.8	5.3
5.8	6.3	6.8	7.3	8.0	68	7.7	7.1	6.5	6.0	5.5
6.0	6.5	7.0	7.6	8.2	69	8.0	7.3	6.7	6.1	5.6
6.1	6.6	7.2	7.8	8.4	70	8.2	7.5	6.9	6.3	5.8
6.3	6.8	7.4	8.0	8.6	71	8.4	7.7	7.0	6.5	5.9
6.4	7.0	7.6	8.2	8.9	72	8.6	7.8	7.2	6.6	6.0
6.6	7.2	7.7	8.4	9.1	73	8.8	8.0	7.4	6.8	6.2
6.7	7.3	7.9	8.6	9.3	74	9.0	8.2	7.5	6.9	6.3
6.9	7.5	8.1	8.8	9.5	75	9.1	8.4	7.7	7.1	6.5
7.0	7.6	8.3	8.9	9.7	76	9.3	8.5	7.8	7.2	6.6
7.2	7.8	8.4	9.1	9.9	77	9.5	8.7	8.0	7.4	6.7
7.3	7.9	8.6	9.3	10.1	78	9.7	8.9	8.2	7.5	6.9
7.4	8.1	8.7	9.5	10.3	79	9.9	9.1	8.3	7.7	7.0
7.6	8.2	8.9	9.8	10.4	80	10.1	9.2	8.5	7.8	7.1
7.7	8.4	9.1	9.8	10.6	81	10.3	9.4	8.7	8.0	7.3
7.9	8.5	9.2	10.0	10.8	82	10.5	9.6	8.8	8.1	7.5
8.0	8.7	9.4	10.2	11.0	83	10.7	9.8	9.0	8.3	7.6
8.2	8.9	9.6	10.4	11.3	84	11.0	10.1	9.2	8.5	7.8
8.4	9.1	9.8	10.6	11.5	85	11.2	10.3	9.4	8.7	8.0
8.6	9.3	10.0	10.8	11.7	86	11.5	10.5	9.7	8.9	8.1