Internship Training

At

National Health Mission

A study to assess the nutritional status of under-five children after two months of first contact with NRC Bhind district (M.P)

By

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PG/15/010

Under the guidance of

Dr. PRADEEP PANDA
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Post Graduate Diploma in Hospital and Health Management

2015-17

International Institute of Health Management Research New Delhi

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **Ankur Jain** student of Post Graduate Diploma in Hospital and Health Management (PGDHM) from International Institute of Health Management Research, New Delhi has undergone internship training at **National Health Mission** from **February 2017** to **April 2017.**

The Candidate has successfully carried out the study designated to him 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. A.K. Agarwal
Dean, Academics and Student Affairs
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मुख्य चिकित्सा एवं स्वास्थ्य अधिकारी,जिला–भिण्ड

क्रमांक/एनएचएम/मई/2017/ भिण्ड दिनांक....10/05/2017/

(Completion of Dissertation from National Health Mission, Madhya Pradesh)

The certificate is awarded to
Dr. Ankur Jain

In recognition of having successful completion of his Internship in the department of

NRC

Has successfully completed his Project on

A study to assess the nutritional status of under five children after two months of first contact with NRC in Bhind District (Madhya Pradesh)

From February to April, 2017

He comes across as a committed, sincere & diligent person who has a strong drive & zeal for learning. We wish him, all the best for future endeavours

District Program Manager
Training & Development

Chief Medical & Health Officer
Bhind, Madhya Pradesh

Certificate of Approval

The following dissertation titled "**A study to assess the nutritional status of under five children after two months of first contact with NRC in Bhind District (Madhya Pradesh)**" at "**International Institute of Health Management Research, New Delhi** is hereby approved as a certified study in management carried out and presented in a manner satisfactorily to warrant its acceptance as a prerequisite for the award of Post Graduate Diploma in Health and Hospital Management for which it has been submitted. It is understood that by this approval the undersigned do not necessarily endorse or approve any statement made, opinion expressed or conclusion drawn therein but approve the dissertation only for the purpose it is submitted.
Dissertation Examination Committee for evaluation of dissertation.

Name	Signature
Dr. Pradeep Pande	PK Pande
Dr. Manish Priyadarshi	

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एक कदम स्वच्छता की ओर

मुख्य चिकित्सा एवं स्वास्थ्य अधिकारी,जिला–भिण्ड

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Certificate from Dissertation Advisory Committee

This is to certify that **Dr. Ankur Jain,** a graduate student of **Post graduate diploma in hospital and health management** has worked under our guidance and supervision. He is submitting this dissertation titled **"A study to assess the nutritional status of under five children after two months of first contact with NRC" in Bhind District (Madhya Pradesh)** at NHM in partial fulfilment of the requirements for the award of the **Post graduate diploma in hospital and health management.**

This dissertation has the requisite standard and to the best of our knowledge no part of it has been reproduced from any other dissertation, monograph, report or book.

PK Panda

(Dr. Pradeep Panda)
Professor & Dean (Research)

(Bharat Jain)
District Program Manager

INTERNATIONAL INSTTITUTE OF HEALTH MANAGEMENT RESEARCH, NEW DELHI

CERTIFICATE BY SCHOLAR

This is to certify that the dissertation titled **"A study to assess the nutritional status of under five children after two months of first contact with NRC" in Bhind District (Madhya Pradesh)** submitted by Ankur Jain, Enrollment No. **PG/15/10** under the supervision of **Dr. Pradeep Panda, Professor & Dean (Research), IIHMR-New Delhi** for award of Post-Graduate Diploma in Hospital and Health Management of the Institute carried out during the period from **February 2017** to **April 2017** embodies my original work and has not formed the basis for the award of any degree, diploma associate ship, fellowship, titles in this way or any other Institute or other similar institution of higher learning.

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मुख्य चिकित्सा एवं स्वास्थ्य अधिकारी,जिला–भिण्ड

क्रमांक/एनएचएम/मई/2017/

भिण्ड दिनांक....10/05/2017/

FEEDBACK FORM

Name of the Student: Ankur Jain

Dissertation Organisation: National Health Mission

Area of Dissertation: NRC

Attendance: Full

Objectives achieved:

- Visits to NRC for observation and assessment
- Participation in State, Districts, Block Meetings held by an organization

Strengths:

- Hard working and sincere
- Always complete tasks with full dedication
- Good analytical and communication skills
- Good Team player

Suggestions for Improvement: Coordination skills can be an area for improvement.

Bharat Jain

District Program Manager

Date: 10 May 2017
Place: Bhind

PREFACE

Childhood Malnutrition is an important public health and development challenge in India. Malnourished children have significantly higher risk of mortality and morbidity, besides increasing the risk of death and disease.

NFHS 4 shows that the proportion of children who are stunted or underweight increases rapidly with the child's age from birth to age 20-23 months; peaking at age 20 months. Even during the first six months of life, when most infants are breastfed, 20-30 percent of children are underweight. It is notable that by age 18-23 months, when many children are being weaned from breast milk, 30 % of children are severely stunted and one-fifth is severely underweight. 43 % children under age of five years are underweight (low weight for age). 48% children under five are stunted (low height for age). 20 % children under five years of age are wasted (low weight for height); Over 6 per cent of these children are severely wasted (<-3SD). Since 'wasting' denotes acute malnutrition, these children are said to have Severe Acute Malnutrition or SAM.

During preschool period, child is mostly dependent on mother for all its nutritional needs. Hence it is argued that the mother being the major care provider for the child during preschool period, her status in the family may have bearing on nutritional status of her child.

According to the WHO guidelines SEVERE ACUTE MALNUTRITION can be defined as:

- Weight for height is less than -3SD.
- Mid upper arm circumference MUAC is less than 11.5cm.
- Bilateral pitting edema.

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At the onset of the report I would like to express my special gratitude and appreciation for my college authorities for allowing me to pursue my Dissertation from National Health Mission, Madhya Pradesh

I would like to extend my special gratitude for my mentor, **Dr. Pradeep Panda** for helping me in my dissertation and guiding me throughout the process.

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So I would like to thank all the consultants in various departments and other staff members at District Hospital, Bhind, Madhya Pradesh for being so helpful all the time and making this Dissertation project an unforgettable experience.

ABBREVIATIONS

NRC	Nutritional Rehabilitation Centre
WFH	Weight for height
MDG	Millennium Development Goals
SAM	Severe Acute Malnutrition
MP	Madhya Pradesh
SD	Standard Deviation
AWC	Anganwadi Centres
ICDS	Integrated child development service
MUAC	Mid upper arm circumference
NFHS	National family health survey
NRHM	National Rural Health Mission
RUTF	Ready to use therapeutic food
WHO	World health organization

ABSTRACT

The aim of study is to identify the nutritional status of male and female children under five years of age and to identify factors affecting the nutritional status after completion of two months of first contact to NRC. The Objective of the study is to study nutritional status of children less than five years of age after completion of two months with NRC, and assess the various factors affecting the nutritional status of these children, and assess the gaps in management of malnourished children at home. It is a cross-sectional interview-based study. The tools are predesigned and piloted for use among the mothers of 36 children who have utilized services of NRCs in the past and meet the study inclusion criteria. Permission of concerned authorities has been taken after explaining the nature and utilization of study.

A cross-section study for the period of 3 months was conducted. 36 children who were admitted in NRC Bhind and in Bhind district, before two months were listed. The tool was administered at the residence of the child to the mother. The beneficiaries have been stratified as18 males and 18 females. From this list, those were included in the study who had completed four follow ups during two months after release form NRC. Children who had not completed four follow ups and those who are more than five years of age are excluded from this study.

ORGANIZATION PROFILE

Introduction

National Rural Health mission- (2005- 2012)

The National Rural Health mission (NRHM) was launched by the Hon'ble Prime Minister on 12th April 2005, to provide accessible, affordable and quality health care to the rural population, especially the vulnerable groups.

The key features in order to achieve the goals of the Mission include making the public health delivery system fully functional and accountable to the community, human resources management, community involvement, decentralization, rigorous monitoring & evaluation against standards, convergence of health and related programs form village level upwards, innovations and flexible financing and also interventions for improving the health indictors.

The National Health Mission-

The Union Cabinet vide its decision dated 1st May 2013 has approved the launch of National Urban Health Mission (NUHM)

The National Health Mission (NHM) encompasses its two Sub-Missions, the National Rural Health Mission (NRHM) and the newly launched National Urban Health Mission (NUHM).

The main programmatic components include Health System Strengthening in rural and urban areas- Reproductive-Maternal- Neonatal-Child and Adolescent Health (RMNCH+A), and Communicable and Non-Communicable Diseases. The NHM envisages achievement of universal access to equitable, affordable & quality health care services that are accountable and responsive to people's needs.

Vision of the NHM-

"Attainment of Universal Access to Equitable, Affordable and Quality health care services, accountable and responsive to people's needs, with effective inter-sectorial

convergent action to address the wider social determinants of health".

Core Values-

- Safeguard the health of the poor, vulnerable and disadvantaged, and move towards a right based approach to health through entitlements and service guarantees
- Strengthen public health systems as a basis for universal access and social protection against the rising costs of health care.
- Build environment of trust between people and providers of health services.
- Empower community to become active participants in the process of attainment of highest possible levels of health.
- Institutionalize transparency and accountability in all processes and mechanisms.
- Improve efficiency to optimize use of available resources.

Goals of NHM-

1. Reduce MMR to 1/1000 live births

2. Reduce IMR to 25/1000 live births

3. Reduce TFR to 2.1

4. Prevention and reduction of anaemia in women aged 15–49 years

5. Prevent and reduce mortality & morbidity from communicable, non- communicable; injuries and emerging diseases

6. Reduce household out-of-pocket expenditure on total health care expenditure

7. Reduce annual incidence and mortality from Tuberculosis by half

8. Reduce prevalence of Leprosy to <1/10000 population and incidence to zero in all districts

9. Annual Malaria Incidence to be <1/1000

10. Less than 1 per cent microfilaria prevalence in all districts.

11. Kala-azar Elimination by 2015, <1 case per 10000 population in all blocks.

Components of financing and support –

This financing to the state will be based on the state's Programme Implementation Plan (PIP). The PIP shall have following parts:

Part I: NRHM RCH Flexi pool

Part II: NUHM Flexi pool,

Part III: Flexible Pool for Communicable Diseases

Part IV: Flexible Pool for Non Communicable Diseases, Injury and Trauma

Part V: Infrastructure Maintenance

State profile

Madhya Pradesh is the 2nd largest state in the republic of India, with nearly 6% of the country's population & stands at 25th position in the level of literacy. The density of population is 196, with 22.27% of tribal population. The state is characterized by geographical, social and cultural variations. The state is among the high focus states of the country, because of poor Human development index, literacy, infrastructure facilities, availability of health manpower, and health outcomes. The majority of tribal communities continue to be vulnerable even today in comparison to the general population and this is reflected in the socio-economic realities and problems of these groups such as land alienation, indebtedness, deprivation of forest rights, which is further compounded by low literacy and high school drop-out rates and of extreme poverty

Vision of NHM Madhya Pradesh

The State's vision statement is as follows:-

'All people living in the state of Madhya Pradesh will have the knowledge and skills required to keep themselves healthy, and have equity in access to effective and affordable health care, as close to the family as possible, that enhances their quality of life , and enables them to lead a healthy productive life'.

Thus, it may be observed that the State's vision has primarily two components, namely

empowering the people living in the State with knowledge and skills required to keep them healthy and equity in access to effective and affordable health care.

The State of Madhya Pradesh also subscribes to the vision adopted by the National Rural Health Mission. Consequently, the adapted vision components to be pursued by the State are presented in the box below:

Introduction

Background

In India, the prevalence of SAM in children remains high despite overall economic growth. The National Family Health Survey-4 revealed that 9.2 percent of all children under-five years of age are severely wasted.

According to the National Survey (NFHS-4, 2015-16)

- 42.8 percent children under age of five years are underweight (low weight for age).
- 42 percent children under five are stunted (low height for age).
- 25.8 percent children under five years of age are wasted (low weight for height);
- Over 9.2 per cent of these children are severely wasted (<-3SD). Since 'wasting' denotes acute malnutrition, these children are said to have **Severe Acute Malnutrition or SAM**

India has the largest child development program in the world, yet the progress on malnutrition is limited. A new study says 42% of children in India under the age of five are underweight, and nearly 60% are stunted. The prevalence of underweight children in India is highest among the world and nearly double that of sub-Saharan Africa.42.8% of the children in Odisha are underweight and more girls than boys suffer from severe malnourishment in the state.

Management of the severely malnourished children does not require sophisticated facilities& equipment or highly qualified personnel. It does require that each child be treated with proper care & affection, and that each phase of treatment be carried out properly by approximately trained and dedicated health personnel's. When this is done, the risk of death can be substantially reduced and the opportunity for full recovery greatly improved.

Nutrition Rehabilitation Centre (NRC) is a unit in a health facility where children with SAM are admitted & managed. Children are admitted as per the defined admission criteria & provided with medical & nutritional therapeutic care. Once discharged from the NRC, the child continues to be in the Nutritional Rehabilitation program till she /he attains the defined discharge criteria from the program.

The centre is only component of a larger child survival strategy called Integrated Management of Neonatal and Childhood Illnesses (IMNCI). In October of 2005, UNICEF and the Government of India partnered to implement IMNCI in 25 districts across the country.

Severe acute malnutrition is defined by 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 bilateral pitting oedema. Children are admitted as per the defined admission criteria & provided with medical & nutritional therapeutic care. Once discharged from the NRC, the child continues to be in the Nutritional Rehabilitation program till she/he attains the defined discharge criteria from the program. (WFH -1SD)

Development of emotional & physical stimulation, capacity building of the primary caregivers of the child with SAM through sustained counselling and continuous behavioural change activities are part of NRC activities. Hence, NRC will be a short stay home for children with SAM along with the primary care givers.

The children with SAM are at first screened by AWW in the community.

Identified SAM children admitted to NRC

After reaching the discharge criteria (15% target weight gain, no pitting oedema) the child will be discharged from NRC.

Discharged children come for follow up in NRC.

Follow up support by ASHA/ AWW at community level.

Follow up of children discharged from NRC:

As per the standard guidelines Children discharged from NRC should be followed up at the community level to ensure appropriate feeding, follow up at NRC for scheduled visits and to identify children who are not responding to treatment for referral to the facility level.

Discharge from the facility (NRC)

→ ● Enrolment in AWC
- Supplementary nutrition
- Home visits by AWW/ASHA (Every week in the first 4 weeks and then once in 2 weeks till the child is discharged from program)

→ ● Timely follow up
- ASHA to accompany the child to NRC

→ ● AWW & ANM to conduct follow up assessment and monitoring of growth & development during VHNDs till child recovers completely.

Problem statement

Health systems are most effective when health workers are skilled, motivated, and trained to provide high-quality services. Malnutrition describes a state of imbalance between the dietary needs of the body and the type of diet provided to the body. It impacts brain development, behavioural development, cognitive development and perhaps most visibly growth development. More specifically, the numbers of underweight (low weight-for-age), stunted (low height-for-age) and wasted (low weight-for-height) children are common measures for the number of malnourished children in a

particular country. In East Asia, about 14% of children under 5 are underweight while 16% of them are stunted (UNICEF, 2007), but the prevalence of malnutrition in Madhya Pradesh is much higher. It is estimated that 42.8% of children under five are underweight, 42% are stunted and 25.8% are wasted, with relatively equal proportions of males and females in all three categories (NFHS-2015-16). Malnutrition is also more prevalent amongst the poor and in rural areas.

In Madhya Pradesh 42.8% of under 5 year children are underweight & 71.8% are with Anaemia. Madhya Pradesh has highest IMR (51/1000 live birth) in India & under 5yrs mortality rate is 65 in M.P. According to NFHS-4 Report Madhya Pradesh is only state where child malnutrition is prevalent.

To combat this menace, the Government of Madhya Pradesh aimed at identifying and treating malnourished children. To prevent deaths among severe malnourished children identified under the drive, the Government further started the Nutrition rehabilitation centre (NRCs) under the Bal Shakti Yojana with support from UNICEF. The objectives of the programme are to control malnutrition among the children aged 1-5 years in the state and to bring down the percent of severe malnourished children to less than 1%.

It should be noted that the traditional role division has largely laid the responsibility of childcare on women. This begins at conception and continues until infancy, teenage and adulthood. Therefore, women are key players in the growth and development of children. Malnutrition in turn weakens the immune system of the child, thereby contributes to more than 50 % of deaths associated with infectious diseases among this age group.

Rationale

Malnutrition in children is a severe problem in India. In every year 5.6 million children die before they reach their 5th birthday due to malnutrition. Seven out of every 10 of these deaths are due to diarrhoea, pneumonia, measles, malaria or malnutrition.

This study was conducted to show the differences in nutritional status of under-five males and females and to determine the different bio-social factors associated with these differences. To access the different bio-social factors associated with gender differences

in nutritional status, therefore we need to carry out this study.

Literature Review

In a study conducted in NRC of St Mary's Hospital, Kenya showed that out of 50 malnourished children eligible for follow-up, only 39 (78%) could be traced. Overall mortality was 36 per cent, 28 per cent were found to be underweight, and 36 per cent were in good condition with satisfactory catch up in weight.

In M.P nutritional status of children is 39.9% stunted, 33.3% wasted, 63.3 underweight, 82.6% anemia. M.P According to IIPH 2007 Report Madhya Pradesh is only state where child malnutrition under 5 had increased from 54 to 60 between 1996 to 2006'' [(5)]

Malnutrition in children is a severe problem in India. In every year 5.6 million children die before they reach their 5th birthday due to malnutrition. Seven out of every 10 of these deaths are due to diarrhea, pneumonia, measles, malaria or malnutrition [(13)]

The study done by I.Dey and R.N.Chaudhuri on gender inequality in nutritional status among under five children in a village in Hoogly District, West Bengal, a community based cross- sectional study was conducted to show the differences in nutritional status of under-five males and females and to determine the different bio-social factors associated with these differences. To access the different bio-social factors associated with gender differences in nutritional status, weight for age was used. It was found that female had a higher proportion of malnutrition in both Hindu and Muslims. Among Hindu community, 52.4% females compared to 39.1% of males and among the Muslims, 58% of females compared to 50.6% of males had malnutrition. This study revealed that among the first birth order children 26.9% of the girls were malnourished compared to

43.6% males but the differences was not significant statistically. In this study they found that 55.9%, 51.4% and 42.3% of the girls were underweight, stunted and wasted respectively in comparison to 46.6%, 40.5% and 35.3% of the boys. There was significant higher proportion of malnutrition was found in female children of higher birth order and those belonging to families with low Income. (14)

A majority of the HHs covered in the present survey belonged to backward communities (42.5%) followed by others (31.5%) and Scheduled Caste (18.5%). About 45% of the HHs was nuclear families. About 45% of the mothers were illiterate, two fifth of the HHs (41%) did not possess any agricultural land and about one third (32%) were engaged in either agricultural or other labours. Majority (80%) of the women were housewives. About a half of HHs (55%) lived in semi pucca houses and 21% in kutcha. Majority (96%) of the HHs were using bore well water. Only 16% were using sanitary latrine. Most of the mothers (99%) fed colostrum to their new-born s. About half (53.5%) of mothers initiated breastfeeding within 1hour and 45% did so within 1-3 hours of delivery. None of the infants were given pre-lacteal feeds such as glucose/sugar water, honey, etc. Among 6-11 months children, complementary feeding was initiated at 6 months of age in about 13%, while 33% children received the same during 7-11 months of age. About 43% of children did not receive complementary feeding. Of the 6-11 months infants, about 53% each were receiving cow/buffalo milk and 44% homemade semisolids/solids, about 44% were receiving such foods at least 3 times a day. Among 12-35 months children, about two thirds (69%) received complementary feeding in addition to breast milk. Majority of children (92%) were completely immunized about 97% of 9-59 months children received at least one dose of Vitamin A during the preceding year. The overall prevalence of under nutrition (<Median -2SD, of WHO Child Growth Standards) such as underweight was 53%, stunting was 71% and that of wasting was 15%. The prevalence of underweight and stunting tended to increase with age from 35% and 31% respectively at 5 months of age to 61% and 83% respectively between 24-35 months of age. Significant difference was observed in the prevalence of underweight and wasting among gender. (15)

A study of mortality among malnourished children admitted to a nutrition rehabilitation unit in mat lab, Bangladesh. Cohort study evaluated the mortality patterns of 598

children, aged 6-59 months, with mid-upper-arm-circumference (MUAC) of ≤110 mm on admission at the NRU during August 1986–December 1994 in rural Mat lab, Bangladesh. For comparison, another group of 598 children having similar MUAC matched by sex and age (3 months) and who did not attend the NRU were randomly selected. Children at the NRU received standardized treatment with low-cost, locally-available weaning food along with supplementation of iron and multivitamins. The major outcome variable was mortality over a 24-month period after discharge. Diarrhoea and pneumonia during that period and also socioeconomic factors of the family were compared between the groups for any difference. The cumulative survival probability up to 24 months of follow-up was lower for the NRU group (0.94) than for the comparison group (0.87). The difference in cumulative mortality was the highest in the first three months of follow-up (7.5% vs. 1%). No difference was found in the incidence of diarrhoea and pneumonia and in the socioeconomic status of the family between the groups. [16]

A study done in Pakistan by durre seemi akramet. al. on improving nutrition of malnourished children in the community, using home based treatment, 24 children were included in the study. Eleven children (45.8%) reached – 1SD at the end of 3 months while 10 patients (41.6%) took 4 months. Twenty two patients (91.6%) were at the median weight for height by the end of 5 months shows that home based treatment with locally available foods can be used successfully to rehabilitate severely malnourished children. [17]

In a study done by Malavika A. Subramanyam et al regarding Socioeconomic Inequalities in Childhood Under nutrition in India, the data from the three cross-sectional rounds of National Family Health Survey of India from 1992, 1998 and 2005 were analyzed. They use the data from a time when India began experiencing major economic growth. They expect that this growth to have increased household income decreased food insecurity and improved the quality of nutrients available to Indians. They examined the trends in social disparities like household wealth, maternal education, caste, and urban residence in under nourished children less than three years of age. They also included social issues like age, gender, birth order of child, religion, and age of mother. They

found that the overall prevalence rates of under nutrition among Indian children less than three years decreased over the 1992–2005 period, social disparities in under nutrition over these 14 years either widened or stayed the same. The under nutrition was more due to household wealth then maternal education. There was no disparity due to caste, gender or rural residence. They also observed that the children from better-off households, with better educated mothers appear to have benefited to a greater extent than less privileged children. [18]

In a study regarding Key issues in the success of community-based management of severe malnutrition by Steve Collins et al they found that the Community-based therapeutic care programs provide effective care to the majority of acutely malnourished people as outpatients, using techniques of community mobilization to engage the affected population and maximize coverage and compliance. People with severe acute malnutrition without medical complications are treated in an outpatient therapeutic program with ready to-use therapeutic food and routine medication are treated in an outpatient therapeutic program with ready to-use therapeutic food and routine medication. This type of community-based therapeutic care programs were implemented in Malawi, Ethiopia, and North and South Sudan between 2000 and 2005. These programs, which treated 23,511 cases of severe acute malnutrition, achieved recovery rates of 79.4% and mortality rates of 4.1%.data indicate that these programs are affordable, with the cost-effectiveness of emergency community-based therapeutic programs varying from US$12 to US$132 per year of life gained. [19]

A study of rehabilitation of severely malnourished children using an indigenous high density diet, was conducted in Pakistan. Malnourished patients were randomly allocated to one of three groups. Children of both sexes aged 4-60 months were included in the study. They were all severely malnourished .A calculated sample size of 30 children was assigned to each group. Group A was given only high-density diet for 7 days and then given routine diet plus HDD for the next 7 days. Group B was given routine diet plus HDD for 14 days. Group C was given routine diet only for 14 days, and served as the control group. The study was conducted during July 1996-December 1996 at the Nutrition Unit of the Civil Hospital, Karachi. The HDD diet consisted of rice and lentil

flour, milk-powder, sugar, oil, and water to give a caloric value of 1.5 cal/ml. The regular diet contained a KYB (khichuri, yogurt, and banana) diet with milk added to it (calories 1.1/ml). The two diets were comparable in cost (Rs 10.00/day) and can be prepared at home. The diet was given for 2 weeks. In that study we able to know, The high-density diet is low in cost, easy to prepare at home by mothers, and effective in bringing about rapid weight gain in malnourished children.[20]

A study of Raichur, Karnataka visit reports malnutrition deaths and other child right violation. Raichur district is one of the 30 most backward districts of the country. Unhygienic environmental conditions, high disease burden, poor health seeking behavior of the population, non- availability of the medical facilities etc. are the main reasons for which Raichur created the headlines in the media regarding very high prevalence of malnutrition in children and alleged deaths because of malnutrition. [21]

Research question

What is the linkage of NRC with community and community follow up mechanism for NRC beneficiaries?

Aim

To identify the nutritional status of male and female children under five year of age and to identify factors affecting the nutritional status after completion of two months of first contact with NRC.

Objectives

1. To identify the nutritional status of children under five years of age after completion of two months with NRC.
2. To assess the various factors affecting the nutritional status of these children.
3. To assess the dietary habits of these children

Methodology

This is a cross-sectional interview-based study. A study tool was designed and piloted for use among the mothers of children who have utilized services of NRCs in the past and meet the study inclusion criteria. Permission of concerned authorities was taken after explaining the nature and utilization of the study.

Study design: -

Cross-sectional study

Study setting: -

Children who were admitted in NRC Bhind in Bhind district, before two months were listed. The tool was administered at the residence of the child to the mother.

Study duration: -

3 months

Sample size: -

36 children below five years of age.

Sampling technique: -

Stratified random sampling

Sampling selection: -

I first listed out the children from NRC Bhind who have completed four follow ups to NRC and completed two months of first contact to NRC. The beneficiaries were stratified as males and females. From this list, I had selected 18 male and 18 female children.

Data collection: -

First I collected the background information of children in which information of age, sex, add was determined. Parent's occupation was found out. Then height and weight measurement of children and prior set and tested questionnaire has been used to collect data related to nutritional status and knowledge of feeding practices of mother.

Data analysis procedure: -

Primary data collected using questionnaire. Questionnaire formats / data analysis are made in Excel sheet and analysed.

Categories of malnutrition were made according to WHO child growth standard for identification of sever acute malnutrition (SAM) used in NRC.

WFH-

Category 1-Normal ≥ -2SD

Category 2-Moderate <-2SD

Category 3-Severe <-3SD

MUAC-

Category1- Normal ≤ 11.5

Category2- Moderate 11.5-12.5

Category3- Severe ≥ 12.5

Ethical issues: -

First of all, the participants were explained about the study and then verbal consent was taken from the informants and then interview were conducted. There are no invasive procedures or drug interventions in this study. A written permission was taken from Doctors who were present in NRC for utilizing and analysing the data of NRC Bhind.

Results & data analysis

The present study was undertaken in NRC Bhind. 36 mothers were interviewed by a pre tested questionnaire aimed to find out the nutritional status of these children during follow up visits after discharge and retrospective study of NRC follows up records of 36 children to find out the factors affecting nutritional status of these children. This study was carried out during the period of February to April 2017.

Following findings

Table1: Mean age (in month) of child

Age in months	Frequency
7	2
8	2
9	1
10	5
11	2
12	4
14	1
17	1
18	5
20	1
22	2
23	3
24	3
26	1
36	2
46	1

Total	36

Mean age of child (in month) is 17.47

Gender distribution

Sex	Frequency	Percent
Female	18	50.0%
Male	18	50.0%
Total	36	100.0%

Table2: It summarize male and female child are equally affected by malnourishment

Occupational status (Father occupation.)

Occupation	Frequency	Percent	Valid Percent	Cumulative Percent
Business	6	16.7	16.7	16.7
Labour	30	83.3	83.3	100.0
Total	36	100.0	100.0	

Table3: It summarize that Labour's child is more affected than business worker's child

Economic status(Average monthly income of household)

Income in Rs	Frequency	Percent	Valid Percent	Cumulative Percent
< 5000	23	63.9	63.9	63.9

	5000 - 10000	13	36.1	36.1	100.0
	Total	36	100.0	100.0	

Table4: It summarize that those worker's monthly income less than Rs.5000, their child are more malnourished than that of those workers' whose income is more than Rs.5000

Type of family

Type	Frequency	Percent	Valid Percent	Cumulative Percent
Joint	23	63.9	63.9	63.9
Nuclear	13	36.1	36.1	100.0
Total	36	100.0	100.0	

Table5: It summarize that 63.9% have joint family, 36.1% have nuclear family, children are more malnourished in joint family than nuclear family

No. of Children

No.	Frequency	Percent	Valid Percent	Cumulative Percent
1	6	16.7	16.7	16.7
2	21	58.3	58.3	75.0
3	9	25.0	25.0	100.0
Total	36	100.0	100.0	

Table6: It summarize those family have two children are 58.3% and three children are 25%, only 16.7% have one children, 83.3% have more the one children, due to low socio economic status children are more malnourished in these family.

Housing status

Status		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Rental	9	25.0	25.0	25.0
	Self	27	75.0	75.0	100.0
	Total	36	100.0	100.0	

Table7: It summarize that 75% family have their own house, only 25% live on rent.

Type of house

Type		Frequency	Percent	Valid Percent	Cumulative Percent
	Kachcha	12	33.3	33.3	33.3
	Pakka	24	66.7	66.7	100.0
	Total	36	100.0	100.0	

Table8: It summarize that 33.3% family have kachcha house, only 66.7% have pakka house.

Residential status

Status	Frequency	Percent	Valid Percent	Cumulative Percent
Dense	15	41.7	41.7	41.7
Slums	3	8.3	8.3	50.0
Colony	12	33.3	33.3	83.3
Industrial Area	6	16.7	16.7	100.0
Total	36	100.0	100.0	

Table9: It summarize that 41.7 % live in a dense area, 33.3% in slum, 16.7% in colony, 8.3% in industrial area.

Source of drinking water

Source	Frequency	Percent	Valid Percent	Cumulative Percent
Well	20	55.6	55.6	55.6
Govt.supply	8	22.2	22.2	77.8
Hand pump	8	22.2	22.2	100.0
Total	36	100.0	100.0	

Table10: It summarize that 55.6 % person source of drinking water is well, 22.2%

Government supply, 22.2% Hand pump.

Toilet facility at home

Toilet facility	Frequency	Percent	Valid Percent	Cumulative Percent
No	13	36.1	36.1	36.1
Yes	23	63.9	63.9	100.0
Total	36	100.0	100.0	

Table11: It summarize that 63.9% have toilet facility at home, only 36.1% have no toilet facility at home.

Hand washing practices before meal and after defecation

Hand washing	Frequency	Percent	Valid Percent	Cumulative Percent
Soap	13	36.1	36.1	36.1
Mud	13	36.1	36.1	72.2
Ash	10	27.8	27.8	100.0
Total	36	100.0	100.0	

Table12: It summarize that 36.1% use Soap, 36.1% use Mud, 27.8% use Ash, Hand washing before meal and after defecation.

Food intake at a time

Type	Frequency	Percent	Valid Percent	Cumulative Percent

HALF BOWL	20	55.6	55.6	55.6
ONE FULL BOWL	16	44.4	44.4	100.0
Total	36	100.0	100.0	

Table13: It summarizes quantity of food which is given to the child 1bowl is 44.4% followed by ½ bowls that is 55.6%.

Religion

Religion	Frequency	Percent	Valid Percent	Cumulative Percent
Hindu	32	88.9	88.9	88.9
Muslim	4	11.1	11.1	100.0
Total	36	100.0	100.0	

Table15: It summarizes that 88.9 % malnourishment in Hindu, 11.1% in Muslim.

Mean Height of child during follow up

Time at the measure of child Height	mean Height(length in c.m)
Discharge time	67.708
1st follow up	68.625
2nd follow up	69.416
3rd follow up	69.917
4th follow up	69.917

Table16: Mean height of children gradually increases after discharging and during follow up

Weight of children

Time at the measure of child Weight	Mean Weight(in kg)
Discharge time	6.3510
1st follow up	6.8125
2nd follow up	6.9206
3rd follow up	7.0281
4th follow up	7.0911

Table17: It summarizes weight of child increases between during discharge and 1st follow up. After 1st follow up mean weight gradually increases.

Mean MUAC of children during follow up

Time at the measure of child MUAC	Mean MUAC(cm)
Discharge time	11.902
1st follow up	12.111
2nd follow up	13.766
3rd follow up	12.427
4th follow up	12.525

Table 18: It summarize that mean MUAC gradually increase after discharge to 3rd follow up but somewhat it decreases between 3rd and 4th follow up

Breast feeding at present

Feeding at present	Frequency	Percent	Valid Percent	Cumulative Percent
N	26	72.2	72.2	72.2
Y	10	27.8	27.8	100.0
Total	36	100.0	100.0	

Table19: This table summarize that 27.8% are breast feeding at present 72.2% are not feeding.

How much time did you start Breast feed to your child at birth

Type	Frequency	Percent	Valid Percent	Cumulative Percent
Within 1	4	11.1	11.1	11.1
1 hr	23	63.9	63.9	75.0
More than 24 hrs	9	25.0	25.0	100.0
Total	36	100.0	100.0	

Table20: This table summarize that only 11.1% breast feed their child with in 1 hr, 63.9% more than 1 hour, 25% more than 24 hour.

Did u feed colostrum to your child

	Frequency	Percent	Valid Percent	Cumulative Percent
N	26	72.2	72.2	72.2
Y	10	27.8	27.8	100.0
Total	36	100.0	100.0	

Table21: This table summarize that 27.8% feed colostrum to their child, 72.2% not feed.

What did you given your first child?

	Frequency	Percent	Valid Percent	Cumulative Percent
Breast Milk	10	27.8	27.8	27.8
Honey	24	66.7	66.7	94.4
Jaggery	2	5.6	5.6	100.0
Total	36	100.0	100.0	

Table22: This table summarize that 27.8% feed self-milk, 66.7% feed honey, and 5.6% feed jiggery.

Did you exclusive breast feed your child up to six month of age

Type	Frequency	Percent	Valid Percent	Cumulative Percent
N	29	80.6	80.6	80.6
Y	7	19.4	19.4	100.0
Total	36	100.0	100.0	

Table23: This table summarize that only 19.4% exclusive breast feed up to six month, 80.6% not feed up to six month.

Which type of milk was given before 6 month of age

Type	Frequency	Percent	Valid Percent	Cumulative Percent
Other	7	19.4	19.4	19.4
Buffalo	28	77.8	77.8	97.2
Cow	1	2.8	2.8	100.0

Total	36	100.0	100.0	

Table24: This table summarize that 77.8 % feed buffalo milk, 2.8% feed cow milk to their children.

In which month you started complementary feed

Month	Frequency	Percent	Valid Percent	Cumulative Percent
3	6	16.7	16.7	16.7
4	18	50.0	50.0	66.7
5	5	13.9	13.9	80.6
6	7	19.4	19.4	100.0
Total	36	100.0	100.0	

Table25: This table summarize that 80.6% has started complimentary feed before 6 month.

DITERY HABBIT OF 32 CHILDREN AS INFORMATION GIVEN BY THEIR MOTHER DURING INTERVIEW

VARITY OF FOOD	NO. OF CHILDREN CONSUMING	PERCENTAGE (%)
1. DAL	35	97.23
2. RISE	26	72.23
3. KHICHRI	28	77.78
4. FRUITS	13	36.11
5. GREEN VEGETABLE	1	2.7
6. EGG	3	8.33
7. CHAPATI	14	38.88
8. BUISCUIT	6	16.67

9. BREAD	11	30.56

Table26: this table shows that 97.23% mother are giving dal to their children, 72.23% are giving rice to their children.77.78% giving Khichri and 16.67% are giving biscuits given to children .Although other high fat diets are not given to the children which is very essential, as children takes only small amount of meal at a time so high fat diet will replenish their calories need. Green leafy vegetables are only given by 2.7% of mother to their children and only 36.11% of them are giving fruits so there need of vital elements and fibres are not fulfilled in 50% of the cases because of lack of access to healthy food resources and unability to purchase them leading to malnutrition amongst the children cases.

Discussion

The present study was undertaken in NRC Bhind. 36 mothers were interviewed by a pre tested questionnaire aimed to find out the nutritional status and factors affecting the same and status during follow up to assess the dietary food intake of these children during follow up visits after discharge. This study was carried out during the period of February to April 2017.

The parents of 36 children taken into study almost all are from low socio-economic strata. Almost about 33.3% families are living in kachcha and 66.7 in pakkah house. 63.9% families are having toilet facilities at their home. Only 22.2% have government water supply among the parents of the malnourished children showing there is some correlation between socioeconomic condition of the family and malnutrition.

36.1% of population hand washes with mud and 27.8% wash with ash. In present study, we select 18 female and 18 male malnourished children to see the factor affecting nutritional status of both sexes. Sanitary habits do play a major role in malnutrition. In present study 63.9% families used either mud or ash for hand washing.

Labour's child (83.3%) is more malnourished followed by Business worker's child (16.7%) and because labourer does not provide a healthy diet to his child due to their economic status is low.

That worker's whose monthly income less than Rs.5000 (83.3%) their child is more malnourished followed by whose worker's monthly income Rs 5000-10000(16.7%). Monthly income is directly linked with malnourished child if income is less worker's does not able to provide a healthy diet to his child and this is the reason that child is more malnourished if income is less. 20 children have taken ½ bowl followed by 16 child's have 1 bowl. This is also the reason that child is malnourished.

Mean height of children gradually increases after discharging and during follow up. This shows a good results that child provide a good diet.

Mean weight of child increases between during discharge and 1st follow up. After 1st follow up mean weight gradually increases up to 4th follow up. The reasons that weight of child increases between during discharge and 1st follow up is that parents are proper counselled about diet and another reason is children's are not suffering from any diseases.

Mean MUAC gradually increase after discharge to 3rd follow up but somewhat it decreases between 3rd and 4th follow up. If MUAC is less than 11.5 cm then child suffered from SAM it means during discharge to 1st follow up MUAC is less than 11.5 cm then it will increase. The reasons behind is why MUAC decrease or increase because child who has taken insufficient diet, child whose economic status is low followed by child whose hygiene practice (Hand washing) is not maintain.

In the study it has been observed that only 7 (19.4%) out of 36 mothers have exclusively feed at the age of 6 months. In my study it is also observed that Green vegetables are given by 2.7% of mother to their children and only 36.11% of them are giving fruits. This shows that vital elements and minerals are not given to the children in sufficient quantity leading to malnutrition and anaemia in the children. Also in the study it has been observed that high fat content diet is not given to the children, and as we know that children take only little food at a time so it is needed that high caloric diet should be given to the children.

Mothers don't follow a proper hand wash technique before giving a food to child, child has a soil eating, thumb sucking habit. The reason of insufficient diet given to children's are mother's don't know about breast feeding technique, they don't know how much

quantity of food can be given to children in what age, low economic status, large family size. A study of raichur, Karnataka visit report malnutrition deaths and other child right violation. **R**aichur district is one of the 30 most backward districts of the country is Unhygienic environmental conditions is the reason for malnourishment.

Conclusion

1) This study shows that there is a definite improvement in the condition of malnourished children from admission to discharge from NRC'S.

2) There is remarkable improvement from discharge to the 4 follow-ups showing how important is the continuous observation and advice to the parents of malnourished children.

3) It has also been observed that the conditions of children from 4 follow-ups and at present are more or less same which shows that there is a need of continuous observation and sensitization of the community.

4) The average age of complimentary feeding is more than nine months which shows there is a need of sensitization of workers at village level so that malnutrition can be prevented at an early age.

5) The dietary evaluation of the children shows that the diet is deficient in Vitamin, mineral and micro-nutrients and also fat is deficient.

6) Study also shows that 55.6% population's source of drinking water is well. There is a need to make sure the water is purified or boiled before use for drinking.

7) More than 36.1% families are not having sanitary latrines in their houses and 33.3% are living in kachcha and 66.7% pakka houses in the study, showing the hygienic and socio-economic condition of the families, which indicates that there is some correlation between sanitation and socio economic condition of the family and malnutrition.

Recommendation

1. It is recommended that the parents should be given proper counseling about proper diet and, hygiene practices.

2. Promote early breast feeding & exclusive breast feeding. Rooming in between mother and infant to improve chance for successful breast feeding.

3. Proper counselling given to mothers by service provider after delivery. They give a counselling about hygiene practice, diet (given to children).

4. Growth monitoring cards should be given to all mothers and regular growth monitoring should be done and appropriate actions shall be taken when growth faltering occurs.

5. Appropriate micronutrient rich complementary foods and supplements at 6 months of age should be introduced in the system. If complementary foods are needed earlier, consider the risks associated with interference of breast feeding. RUTF supplement should be incorporated into existing programs.

6. NRC's should be maintained within the reach of the community and every SAM child should be identified and encouraged to take advantage of the NRC'S.

7. It is also recommended that vitamin, minerals and micronutrient deficiency in children is a major cause of malnutrition and this should be taken care of at top priority.

8. The Government should create opportunity of employment to the weaker section of the society so that they can improve their economic condition and also improve accessibility and availability of healthy food for all people.

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Annexure-I

Informed consent

Please read the following before putting your signature below.

- I have been informed by the investigator about the process of the study, including the nature, objectives and methods related to this study.
- I have read and understood the participant information sheet provided to me.
- I am free to participate or not to participate in this study and also leave the study at any point of time. I understand that if I decide not to participate in the study, this will not result in negative personal repercussions.
- I have been given the opportunity to ask questions and reply was given for all the questions to my satisfaction.
- My information is strictly confidential and will be used only for the purpose of the study. I only authorize the persons involved in the research to have access to my information.
- By signing this form, I give my free and informed consent to take part in this study as outlined in the information sheet and this consent form. Specifically, I agree to being interviewed.

Name of the Participant _____

Signature / thumb impression of the Participant _____

Date _____

Name of the interviewer _____

Signature/thumb impression of the interviewer _____

Date _____

Annexure-II

National Health Mission

District Hospital- Bhind (M.P.),

Indicative Questionnaire with coding

Performa **no**.....

Date.....

CONFIDENTIAL-

(1) GENERAL-

1.1 Name of mother

1.2 Husband name

1.3 Age

1.4 Religion-

(A) Hindu **(B)** Islam **(C)** Christian **(D)** Sikh

1.6 Caste-

(A) Gen **(B)** OBC **(C)** SC **(D)** ST

1.7 Address

(A) Bhind (B) Other _ _ _ _ _ _ _ _ _

(2) SOCIO-ECONOMIC DETAILS-

2.1Mother literacy:

(A) Illiterate **(B)** 1-5th (**C)** 6-10th (**D)** 11-12th **(E)** Graduate

2.2 Fathers literacy:

(A) Illiterate **(B)** 1-5th (**C)** 6-10th (**D)** 11-12th **(E)** Graduate

2.3 Age and sex of each children:

MALE

FEMALE

2.4 Number of members in the family

2.5 Type of family.

(A) Nuclear **(B)** Joint

2.6Type of house:

(A) Kachcha **(B)** Kachcha -pakka. **(C)** pakka

2.7 Number of rooms

2.8 Source of drinking water:

(A) Well **(B)** Govt. Supply **(C)** Hand pump

2.9 Father occupation-

(A) Service **(B)** Business **(C)** Labour **(D)** Not working

2.10 Mother occupation-

(A) Service **(B)** Business **(C)** Labour **(D**) House wife

2.11 Father income /month.

(A)<Rs.5thousend **(B)** 5 -10thousend **(C)** 10-20thousend **(D)**>20thousend **(E)** Nil

2.12 Mother income/month.

(A) <Rs.5thousend **(B**) 5-10thousend **(C)** 10-20thousend **(D)** >20thousend **(E)** Nil

2.13 Toilet facility available at home: Yes / No

2.14 Hand washing practices before meals and after defecation:

(A) Water & soap **(B)** mud **(C)** ash

2.16 Housing status-

(A) Self **(B)** Rental

2.17 Residential status-

(A) Dense **(B)** Industrial area **(C)** slum **(D)** colony

2.18 Average monthly income of household- Rupees

(A) <Rs.5thousend **(B)** 5-10thousend

(C) 10-20thousend **(D)** >20thousend

2.19 Distance from NRC.....km

(3) Questionnaire related to child

(1)GENERAL

1.1 Name of child

1.2 Age

1.3 Sex M/F

1.4 Birth order

1.5 Height: ____cm

1.6 Weight: ----- Kg

(2) MEDICAL HISTORY AFTER DISCHARGE FROM NRC

2.1 Immunization status: Y-Complete N- Incomplete

2.2 Measles vaccination given: yes/ No

2.3 Dose of Vitamin A taken: Yes/ No

2.4 History of fever: Yes/ No

2.5 If yes number of episodes.....

2.6 History of Diarrhoea: Yes/ No

2.7 Number of episodes.....

2.8 History of respiratory infection: Yes/ No

2.9 Number of episodes.....

(3) Breast feeding practices

3.1 Breast feeding during Illness Y- Continue. N-stop

3.2 Breast feeding - At present: Yes / No

3.3 If yes how many times a day:

(A) 1 TIME **(B)** 2 TIME **(C)** 3 TIME **(D)** NO FEEDING

3.4 How many times at night:

(A) 1 TIME **(B)** 2 TIME **(C)** 3 TIME **(D)** NO FEEDING

3.5 How much time did u started Breast feeding to our child:

(A) Within 1 hour **(B)** more than 1 hour **(C)** more than 24 hour

3.6 Exclusive breast feeding up to six month of age: yes / No

3.7 What extra feed given before 6 months of age:

(A) Goat milk **(B)** buffalo milk **(C)** cow milk **(D)** milk powder

3.8 Did u feed colostrum to our child: Yes / No

3.9 What did u first feed to our child?

(A) Self milk **(B)** honey (**C**) jiggery **(D)** other

4.0 Water or any other liquid given to child before 6 months of age

Dal/ Rice/ Khhichri/ Suji /Fruits/ Green vegetables/ Egg/
Chapatti/ Biscuit/ Bread/ others specify

(4) COMPLIMENTORY FEEDING-

4.1 In which month u stated complementary feed :.....

4.2 Which type of food given to the child right now:

Liquid / semi-liquid / solid/ mixed

4.3 How many times in a day (24hr).....

4.4 Feeding taken: Of its Own / Assisted/ Both

4.5 Variety of food in diet:

Dal/ Rice/ Khhichri/ Suji/Fruits/ Green vegetables/ Egg/ Chapatti/ Biscuit/ Bread/ others specify

4.6 Quantity of feed at a time:

Half bowl/ one full bowl/ more than one full bowl