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**Original Research Article**

# Maternal health profile of children with severe acute malnutrition admitted in NRC's of Bhopal

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## ABSTRACT

**Background:** Protein energy malnutrition is the most widely prevalent form of malnutrition among under-five children. Factors responsible for malnutrition in India comprise of low birth weight, maternal health problems, delay in introduction of complementary feeds, faulty child care and other poor environmental conditions. This study aims to evaluate the health status of mothers of severe acute malnutrition (SAM) children admitted in three NRC's of Bhopal.
**Methods:** A cross-sectional record based study was done on mothers of 255 children up to 5 year of age who were admitted with SAM in the three NRC of Bhopal district. Details were filled in a questionnaire. The body mass index (BMI) was calculated and graded according to the WHO classification.
**Results:** The mean age of study participants was 24.8 years, mean BMI was 18.5, mean Hb was 10.4 g/dl. According to the BMI, 147 (57.7%) of the mothers were underweight, out of them 43 (16.8%) were severely thin. Anemia was present in 90% mothers, out of which 80% were moderately anemic and 11 (4.3%) was severely anemic, anemia and BMI of mothers have a significant correlation. At the time of the study, 65 (26%) mothers had more than two children and 113 mothers had two children.
**Conclusions:** The health status of mothers indicates that they are undernourished and anemic with lower parity and age. It is therefore recommended that during the 14-21 day stay of SAM child maternal nutrition should be emphasized upon along with counselling sessions.

**Keywords:** Maternal health, Severe acute malnutrition, Nutritional rehabilitation centers, Maternal anemia

## INTRODUCTION

The word malnutrition is a broad term which covers both under-nutrition and over-nutrition (over weight).[1] Globally malnutrition poses problems with effects on the survival of under-five children, increased incidence and prevalence of acute and chronic diseases, delayed milestones leading to declined economic growth of individuals and societies. Maternal and child undernutrition encompasses stunting, wasting, and deficiencies of essential vitamins and minerals, maternal anemia and low BMI.[2] Maternal malnutrition contribute to 20% of childhood stunting according to WHO.[3]

Maternal and child healthy nutrition status plays a crucial role in the development of a region. Maternal and child malnutrition, encompassing both undernutrition and overweight, are global problems with important

consequences for survival, incidence of acute and chronic diseases, healthy development, and the economic productivity of individuals and societies.

As per NFHS 4, 28.4% women between the age group of 15-49 years are underweight (BMI <18.5 kg/m$^2$) while 13.6% females are obese (BMI>25 kg/m$^2$) in Madhya Pradesh. The prevalence of stunting (low height for age), wasting (weight for height), severe wasting and underweight (weight for age) in MP as per NFHS 4 data was estimated to be 42%, 25.8%, 9.2% and 42.8% respectively.[4]

Maternal and child undernutrition and deficiencies of essential vitamins and minerals, was the subject of a Series in The Lancet in 2008, which observed their prevalence, their short-term and long-term consequences, and potential for reduction through high and equitable coverage of proven nutrition interventions. The Series also identified the need to focus on the crucial period of pregnancy and the first 2 years of life i.e. the 1000 days from conception to a child's second birthday. During this period good nutrition and healthy growth have lasting benefits throughout life. [2,5-8]

Much of the literature is available on malnourished children. Through this study we try to bring out maternal malnutrition that might be contributing to malnutrition in the child. Preventing maternal malnutrition can be an effective way of preventing malnutrition in children and thus reducing complications due to malnutrition in mother as well as child.

### *Objectives*

To evaluate the maternal health status of severe acute malnutrition (SAM) children admitted in NRC by considering parity, age, BMI, anemia status of mothers.

## METHODS

A record based observational study design was undertaken to achieve the objective. The study was conducted for a period of 1 month from 1 June 2017 to 30 June 2017 in which records of previous 6 months were collected. The study area was nutritional rehabilitation centers (NRC's) situated in Bhopal district. Out of the five NRC's three were selected randomly. The selected NRC's were JP Hospital, Bairagarh Civil Hospital, Mandideep CHC. The data collection was done from the records of the mothers of SAM children admitted in these NRC's. After seeking permission to assess the records, all the data of last six months were retrieved. The data included maternal age, height, weight, parity & hemoglobin. The data was available for 365 mothers, out of which the complete records were available for only 255 mothers. Data was entered in excel and for analysis EPI info 7 was used.

## RESULTS

Data extraction was done and data of 255 mothers which was available were included for analysis. As per records, majority of mothers i.e. 246 (96.5%) were resident of urban slum and rest 9 (3.5%) mothers were resident of nearby village.

**Table 1: Distribution according to age group.**

| S No. | Age group (years) | Frequency | Percentage (%) |
|---|---|---|---|
| **1** | ≤21 | 49 | 19.2 |
| **2** | 22-25 | 126 | 49.4 |
| **3** | 26-29 | 37 | 14.5 |
| **4** | >29 | 43 | 16.9 |
| **5** | Total | 255 | 100 |

The mean age of mothers was found to be 24.8 years, maximum being in 22-25 years age group. Majority of the mothers 113 (43.92%) were having two children and least were of parity 5 (0.78%) and 104 (40%) mothers with atleast two parity were between 22-25 age group.

Table 2 shows that only 108 (42.3%) mothers had BMI more than 18.5 kg/m$^2$ and rest of them i.e. 57.7% mothers had BMI less than 18.5 kg/m$^2$. Among the mothers having BMI less than 18.5, 68 (26.7%) mothers had mild thinness i.e. BMI 17-18.5, followed by severe thinness in 43 (16.9%) and moderate thinness in 36 (14.1%) mothers.

**Table 2: Distribution according to age group and BMI.**

| S No. | Age group | BMI (kg/m$^2$) | | | | Total (%) |
|---|---|---|---|---|---|---|
| | | >18.5 Normal (no thinness) (%) | 17-18.5 Mild thinness (%) | 16-16.9 Moderate thinness (%) | <16 Severe thinness (%) | |
| **1** | ≤21 | 19 (38) | 09 (18.7) | 10 (20.4) | 11 (22.4) | 49 (19.2) |
| **2** | 22-25 | 53 (42.1) | 35 (22.8) | 15 (11.9) | 23 (18.3) | 126 (49.4) |
| **3** | 26-29 | 12 (32.4) | 14 (37.8) | 08 (21.6) | 03 (8.1) | 37 (14.5) |
| **4** | >29 | 24 (55.8) | 10 (23.3) | 03 (6.9) | 06 (13.9) | 43 (16.9) |
| **5** | Total | 108 (42.3) | 68 (26.7) | 36 (14.1) | 43 (16.9) | 255 (100) |

**Table 3: Distribution according to hemoglobin level.**

| S No. | Anemia grading | Hemoglobin (g/dl) | Frequency | Percentage (%) |
|---|---|---|---|---|
| **1** | No anemia | >12 | 24 | 9.41 |
| **2** | Anemia | 11-11.9 (mild) | 18 | 7.06 |
| **3** | | 8-10.9 (moderate) | 202 | 79.22 |
| **4** | | <8 (severe) | 11 | 4.31 |
| **5** | Total | | 255 | 100 |

Majority of mothers (49.6%) with BMI less than 18.5 were in the age range of 22- 25 years. Out of the 255 mothers 147 (57.6%), out of these 147 low BMI mothers 66 (44.8%) were mother of two.

Above table shows hemoglobin status of mothers of SAM children. Anemia was found in 231 (90.6%) mothers while only 24 (9.4%) mothers were having no anemia. Of them, 202 (79.22%) of mothers were having hemoglobin level between 8-10.9 g/dl and hence were moderately anemic. Out of 231 anemic mothers encountered in our study, 117 (50.6%) were in 22-25 age group.

## DISCUSSION

Women who are undernourished at the time of conception are unlikely to improve their nutritional status during pregnancy, during which the nutritional demands are high due to the growing fetus. Such females fail to gain sufficient weight during pregnancy and have a higher risk of mortality and morbidity. The mean age of mothers was 24.8 years and maximum belonged to age group of 22 to 25 years. In a study Maternal Malnutrition in Urban India which was done in Indian Cities (Mega, Large and Small) by Musahar, 41.6% women belonged to 15-19 years.[9]

As per NFHS 4, 24.8% of females in the age group between 15 to 49 years were having BMI less than 18.5, while in our study, we found that 57.7% of females were having BMI less than 18.5. This is because, NFHS is a community based survey and include large sample size which is representative of general population, but our study being a facility based, included only mothers of severely malnourished child.[4]

In our study, we found anemia of all grades in 90.5% participants, while in a study conducted by Jose et al in 2008, the prevalence of anemia was found to be 55%.[10] In another study conducted by Musahar, anemia was prevalent in 48.8% mothers.[9] This difference in anemia is due to study area. Our study was conducted in NRCs while other two were community based study. Since our study is record based and facility based, results cannot be generalised. Maternal malnutrition do have tendency to cause serious public health problem. It does not only lead the family to drain of the poverty but it also severely affects the future generations. Ultimately, it diminishes the quality of life of the population.

## CONCLUSION

Most of the mothers were moderately anemic and had low BMI with parity of two at a younger age (22-25 yrs). Maternal under-nutrition might be the possible factor leading to child under-nutrition and their admission to NRC.

### *Recommendations*

- Mothers (specially with 1&2 parity) with anemia should be given iron folic acid tablets during the 15 – 20 days stay at NRC and 2 months follow-up, also Hb status should be assessed on follow up.
- Mothers with low BMI should be given proper diet and nutrition during the stay from the same kitchen.
- Mother and child having same food will encourage child to have the feeds.
- More emphasis should be paid on the education and counseling of the mothers.
- Also emphasis should be made on health of adolescent so that BMI and anemia status remains good when they conceive.

### *Limitations*

Since the present study was a record based, facility based study, results could not be generalised. Being a record based study; we could not study possible factors leading to under-nutrition amongst mothers.

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