Sociodemographic Profile of Severely Malnourished Children Admitted to a Nutritional Rehabilitation Centre in one of the Districts of Maharashtra: A Cross sectional Study

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Abstract:

Introduction : Globally malnutrition remains the one of the leading causes of mortality contributing to 60% of deaths in under five children. Severely acute malnutrition children are admitted to Nutritional rehabilitation centre for promoting their clinical and psychological growth. **Objective:** To describe the sociodemographic profile of severely malnourished children admitted in NRC. **Method:** The cross sectional study was conducted in a Nutritional Rehabilitation Centre (NRC) of a District Hospital of Thane in Maharashtra among the under five children of age group 6 to 60 months who were admitted in NRC and staying in Thane block during study period. Complete enumeration method was used. A Total Sample size of 96(based on the inclusion criteria) was obtained for the purpose of record based data, while for interview sample size was 73(20 cases were non traceable and 3 death were reported) with the parents/guardians of the children. Data was collected using a pre-validated semi structured interview guide via face to face interview. The study was conducted during the 18 month period from March 2017 to August 2018. Data was analysed by using SPSS software version 22.0. **Results:** Majority of the children admitted to the NRC were male (55.2%). Majority of the mothers were educated till middle school (34.3%) as were the majority fathers (37%). Majority of children had birth order<3 (76.7%). Acute respiratory infection (34.4%), acute gastroenteritis (26%) and acute febrile illness (19.8%) were the most common comorbidities observed among the children. Prelacteal feed was given in 5.1% children and colostrum was given to 56.1%, exclusive breast feeding was not given in majority of the children (65.8%). **Conclusion:** Severe acute malnutrition appears to be more prevalent among households belonging to middle and lower middle class. Educational status of parents was found to be low among majority of the study participants. Exclusive breast feeding was also lacking in majority of the children.

Keywords: Nutritional Rehabilitation Centre, Severe Acute Malnutrition, Under Five Children

Introduction:

Nearly half of all deaths in under five children are attributable to undernutrition which puts the children at greater risk of dying from common infections and also increases the frequency and severity of such infections, and delays the recovery.[1]

In 2022 globally, 45.0 million children under five were wasted of which 13.7 million were severely

Quick Response Code	Access this article online	How to cite this article :
	Website : www.healthlinejournal.org	BorkarP, Sangam R, Rawat S, Kembali R. Socio demographic Profile of Severely Malnourished children admitted to a Nutritional Rehabilitation Centre in one of the Districts of Maharashtra: A Cross sectional study. Healthline. 2024;15(4): 305-311
	DOI : 10.51957/Healthline_660_2024	

Received : 04-10-2024 **Accepted** : 30-12-2024 **Published :** 31-12-2024

wasted. This translates into a prevalence of 6.8 per cent and 2.1 per cent, respectively. Between 2000 and 2022, stunting prevalence globally declined from 33.0 per cent to 22.3 per cent, and the number of children affected fell from 204.2 million to 148.1 million.[1]

In India, 36% of children under five years are stunted which is a sign of chronic malnutrition.19% of children under five years are wasted while 32% of children under five years are underweight. The prevalence of undernutrition is same among the girls and boys, although girls are slightly less wellnourished than boys on all three measure (stunting, wasting, underweight). Forty-six percent of children born to mothers with no schooling are stunted, compared with 26 percent of children born to mothers with 12 or more years of schooling. The corresponding proportions of underweight children are 42 and 23 percent, respectively. Maharashtra has 35% stunting, 26% wasting in under five children.[2] Nutrition Rehabilitation Center (NRC) is a unit in a health facility where children with Severe Acute Malnutrition (SAM) are admitted and managed. Keeping this in mind this study was carried out with the objective to find the sociodemographic profile of severely malnourished children admitted in NRC .

Method:

A cross sectional observational study at a Nutritional Rehabilitation Centre (NRC) of a Thane District Hospital in Maharashtra. The study was conducted for 18 months period from March 2017 to August 2018.

Study population with inclusion and exclusion:

Study participants included the children suffering from severe acute malnutrition (SAM) in the age group of 6-60 months admitted to the NRC. Interview of their parents/guardians who were presently staying in Thane district were conducted.

Sampling method and sample size:

Complete enumeration method was used during the study. In a year, approximately 150 children were admitted in NRC. The children who failed to complete prescribed number of follow ups at NRC, were traced with the help of records available at the NRC and house visits were conducted. Total number of cases registered in NRC (as per the inclusion criteria) during the study period were 96. Out of these cases, 56 did not complete the prescribed number of follow-ups at NRC, among these 33 cases were successfully traced in the community and home visits were conducted for interview, whereas 20 cases were non traceable and 3 deaths were reported. Therefore, for the purpose of record based data of the study sample size was 96, while for interview it was 73.

Study tool and Data collection:

Descriptive analysis of socio-demographic factors, birth history, breast feeding practices were presented in the form of tables. After taking the informed consent from the parents of SAM cases fulfilling inclusion criteria of the study, data was collected by analysing the records and using a pre-validated semi structured interview via face to face interview.

Data Analysis:

Institutional Ethics Committee approval was taken and other necessary permissions were taken before commencement of the study. All responses were tabulated by using Microsoft-Excel 2013 Software. Data was analysed by using SPSS software version 22.0 .

Results:

It was observed that majority of the children admitted to the NRC were male (55.2%), and majority belonged to 13-24 months age group (44.79%), followed by 6-12 months age group (28.12%). (Table 1) Most of the participants were Hindu by religion (74%), belonging to general

category (64.6%), belonging to middle (42.70%) and lower middle (39.58%) socioeconomic class. Majority participants were from urban areas (57.2%) while rest lived in rural areas (42.8%). Family type of majority participants was nuclear (60.3%). Majority of mothers were educated till middle school (33.3%) as were the majority fathers (31.25%). By occupation majority fathers were skilled labour (38.4%) and mothers were housewives (93.2%). Majority mothers belonged to 21-23 years age group (56.2%). About living conditions, majority lived in a semi - pakka house (46.6%), with overcrowding in their homes (56.2%). Majority had a piped water supply (43.8%).

Table 1: Socio-demographic details of the study participants (N=96)

Variable	n (%)
Gender	
Female	53 (55.20%)
Male	43 (44.80%)
Age-group (Months)	
6-12	27 (28.12%)
13-24	43 (44.79%)
25-36	16 (16.70%)
37-48	6 (6.20%)
49-60	4 (4.20%)
Religion (Years)	
Hindu	71 (74.00%)
Muslim	20 (20.80%)
Other	5 (5.20%)
Socioeconomic status	
Upper	5 (5.20%)
Upper middle	12 (12.5%)
Middle	41 (42.70%)
Lower middle	38 (39.58%)
Fathers' education	
Illiterate	11 (11.45%)
Secondary and above	27 (28.12%)
Primary	28 (29.16%)
Middle school	30 (31.25%)
Mothers' education	
Illiterate	18 (18.75%)
Primary	31 (32.29%)
Middle	32 (33.33%)
Secondary and above	15 (15.62%)

Table 2: Birth history and Feeding History of Study Participants (N=73)

Variable	n (%)
Place of delivery	
Home delivery	4 (5.50%)
Institutional delivery	69 (94.50%)
Term at time of delivery	
Preterm	16 (21.90%)
Term	57 (78.10%)
Colostrum given	
No	32 (43.90%)
Yes	41 (56.10%)
Exclusive breast feeding	
Yes	25 (34.20%)
No	48 (65.80%)
Immunization status	
Partial immunization	19 (74.00%)
Immunized as per age	54 (26.00%)
Birth Order	
≥3	17 (23.30%)
<3	56 (76.70%)
Birth weight (N=69)	
Normal birth weight	52 (75.40%)
Low birth weight	17 (24.60%)
Prelacteal feed	
Yes	11 (15.10%)
No	62 (84.90%)
Top fed	
Yes	15 (20.60%)
No	58 (79.40%)
Mixed Fed	
Yes	33 (45.20%)
No	40 (54.80%)

Table 2 shows the details of birth history in and feeding practices observed among the children. Majority of the children were delivered in an institution (94.5%), and were full term babies (78.1%), the birth order of majority was <3 (76.7%), and majority had normal birth weight (75.4%). Breast feeding was initiated in 1st hour of birth in 24.7% of children. In 38.4% study subjects, breast feeding was started in 1 to 6 hours after delivery. In 23.2%, it was started in between to 6-24 hours and in 13.7% more than 24 hours of delivery. Pre lacteal feed was given in 15.1% children and colostrum was

given to 56.1%, exclusive breast feeding till 6 months was not done in majority of the children (65.8%). Also majority (74%) were partially immunised.

In 37 (50.7%) study subjects complementary feeding started in between 6-9 months. In 33 (45.2%) study subjects started before 6 months and in 3 (4.1%) it was started after 9 months.

The most common comorbidities observed among the children were Acute respiratory infection (34.4%), acute gastroenteritis (26%) and acute febrile illness (19.8%). Majority of the participants stayed between 7-15 days at the NRC (71.9%) while 25% required more than 15 days stay. Among the participants 80.2% were discharged for follow up. Majority of the participants (48.1%) showed weight gain between 5-9.9 gm/kg/day. Target weight defined as 15% gain from admission weight was achieved by 50% of the participants. Although it is worth noting that majority didn't complete all the stipulated 4 follow-ups which was completed by 41.7% participants while 24% didn't come for any follow-up. The average duration of stay required in between 7 to 15 days and most children admitted to the NRC show moderate rate of weight gain. Mean Weight, Height, and MUAC all showed improvement on discharge from NRC. The mean weight gain during the stay was 0.500 kg, mean height/length gain is 0.13 cm and mean gain in MUAC is 0.11 cm.

Discussion:

Socio demographic profile of the children

In the present study majority of the children admitted in the NRC were male, similar findings were reported in the study by Chaurasiya et al[6], meanwhile females were reported to be more in studies conducted by Shalini et al,[3] Panigrahi et al[4] and Patel et al.[5] The differences in the findings could be due to different socio-geographical conditions of the study areas. Malnutrition seems to be more or less distributed equally among the sexes and no clear predilection towards any one sex.

In the present study majority of the children affected were from 13-24 months age group followed by 6-12 months age group, similar findings were reported by Chaurasiya et al,[6] Panigrahi et al,[4] Majid et al [7], the findings in the present study along with those observed by other authors suggest that the younger age group especially from 12-24 months seems more vulnerable to suffer from malnutrition.

Children with severe malnutrition often have other comorbidities as well, in the present study the major comorbidities noted were, acute respiratory infections followed by acute gastroenteritis and acute febrile illness. In the study done by Shalini et al[3] acute respiratory illness was also the major comorbidity, in the study by Das et al[16] the major comorbidity observed was anaemia, similar finding was observed by Chaurasiya et al.[6] Panigrahi et al[4]observed ARI as the major comorbidity, while Majid et al[7] and Nagar et al[8] observed gastroenteritis and respiratory infections as major comorbidities.

In the present study majority of the children stayed at the NRC for 7-15 days duration, in the study done by Panigrahi et al[4] majority of the patients stayed for <15 days. The duration of stay along with the weight gain also depends on the comorbidities present at the time of admission and the duration it takes for resolution. A child admitted with any severe infection or having major nutritional deficiencies may require a longer duration of hospital stay. The differing findings between studies can be a result of this.

In the present study majority of the patients were discharged for follow-up suggesting recovery rate of 80.2%, similar findings were reported by Shah R et al.[9] and Dhanalakshami et al.[10] and The findings suggest that the interventions provided at the NRC are effective and put the children on a path to recovery from severe acute malnutrition.

In the present study majority of the patients gained weight at a moderate rate of 5-10 gm/kg/day,

with mean weight gain rate being 7.484 ± 3.49 gm/kg/day. on the contrary in study by Alka Mathur et al [11] more children gained weight at moderate to good rate with 8.5 gm/kg/day being the average weight gain. Hashmi et al [12] reported a rate of weight gain of 7.9+/-1.6 gm/kg/day while Dhanalakshmi et al[10] reported it to be 4.4 gm/kg/day. The difference in the weight gain can be attributed to different co-morbidities, socio-economic condition and different geographic areas of the study participants.

In the present study 50% of the children achieved target weight, similar findings were reported by and Dasgupta et al.[13] Contrary findings with lesser percent of children achieving target weight were reported by Hashmi et al.[12]

In the present study, majority participants were from urban areas, similar findings were reported by Gamit et al [14] on the contrary Shukla et al[15] reported majority to be from the rural areas, similarly Das et al,[16] Majid et al,[7] reported majority to be from rural areas. The location of the NRC can be a factor responsible for this discrepancy in findings. NRC located near cities tend can have more urban population reporting to them for services while those away from cities can have major proportion of patients from rural areas.

In the present study majority participants lived in nuclear families, similar finding was reported by Majid et al,[7] Shukla et al.[15] Sekhar CC et al.[17] and Aprameya et al.[18] in the present study with regards to education 8.2% fathers and 17.8% mothers were illiterate, a higher proportion if illiteracy was reported by Shukla et al.[15] with 30.2% fathers and 46.6% mothers being illiterate, similarly in study by Shalini et al.[3] 43% mothers were illiterate while Dhara Patel et al.[5] reported 65% mothers to be illiterate. The difference in findings may be due to different socio-geographical conditions of the study participants.

In the present study majority of the participants belonged to middle and lower middle class according to B.G.Prasad socioeconomic scale, contrary findings were reported by Shalini et al,[3] Das et al.[16] Chaurasiya et al,[6] Majid et al[7] and Nagar et al[8] where the majority belonged to lower socio-economic class. In study by Aparemaya et al[19] 56% were from upper lower and 37.4% from lower middle class. Malnutrition tends to be more common among people belonging to lower and lower middle class as observed in the present study as well as by other authors.

In the present study majority lived in a semi - pukka house, in the study by Prashanth MR et al[19] majority lived in a pakka house, while in study by Shukla Y et al[15] the major housing seen was kuccha house. Overcrowding was seen in homes of 56.2% this was lower than that reported by Shukla Y et al[15] who observed it to be present in 72.9% households. Majority participants had piped water supply (43.8%), although this was lower than that observed by Musa et al[22] who observed 76.04% having piper water supply.

Birth profile and feeding practices

Majority of the children had institutional delivery (94.5%), and majority had normal birth weight (75.4%), Shukla Y et al[15] in their study observed similar trend but proportion of low birth weight children was higher than the present study (39.1%), whereas Aprameya et al[18] observed majority (68.1%) to be having low birth weight, Purohit el al[20] in their study observed low birth weight in 7.98% participants which was lower than the present study, Shalini H et al.[3] in their study observed low birth weight among 44.5% children admitted to NRC. The difference can be attributed to different study settings and different socioeconomic conditions among the study participants. Majority children were birth order <3, with 39.7% being 1st birth order followed by 37% being 2nd birth order, similar findings were reported by Syed Tariq A et al.[21] and Shalini H et al,[3] Prashanth MR et al[19] in their study observed more prevalence of children with

birth order 2nd than 1st similar to that observed by Khargekar et al.[22]

In the present study majority of the children were started breastfeeding between 1-6 hours of birth, whereas only 24.7% were started breastfeeding within the 1st hour, similar results were observed by Wadde S K et al,[23] Aprameya et al[18] in their study however observed that higher proportion of children were started breastfeeding within 1st hour after birth (31.9%). Colostrum was given to 56.1% children in the present study which was lower than that observed by Shalini et al[3] (92.9%) but higher than that by Das et al[16] (39%). Also 15.1% children were given some form of prelacteal feed, which was higher than that observed by Shalini et al [3](10.4%), but lower than that observed by Das et al (32%).[16] The differences in feeding patterns can be due to cultural differences in the study areas, and also local customs and routines followed. Difference in awareness about the correct feeding practices can also be one of the factors which can cause such differences in reporting. Similarly the post-delivery status of the child and mother also has a bearing on the initiation of breastfeeding. In the present study only 34.2% children were exclusively breast fed for 6 months, this was higher than that observed by Das et al[16] (10%) but lower than that observed by Shalini H et al[3] (80.6%), Prashanth MR et al[19] observed a higher proportion than the present study (57.3%) while Shukla Y et al[15] (19.2%) and Aprameya et al[18] (20.9%) observed lower proportion of 6 months exclusive breast feeding than the present study. The difference in local customs and culture, condition of the mother and baby and socio-economic differences between the populations can be some of the factors attributing to such difference in findings.

In the present study 74% of the admitted children with SAM were immunised as per age while the rest were partially immunised, similar findings were reported by Majid et al [7] (73.8%), while Das et al[16] reported a higher proportion of partially immunised children (85%) and Shalini et al[3] observed a higher proportion(85%) as compared to the present study.(1,5,14) In the present study no child was unimmunised while Shalini et al,[3] Das et al[16] and Majid et al[7] had children who were not given any vaccination (1.2%, 4.3% & 3.9%). Mishra et al,[24] Shukla Y et al[15] reported a higher proportion of partially immunised children (42%, 31.7%).

Conclusion:

Severe acute malnutrition seems to be more prevalent in the younger age group of children, these children often have associated comorbidities like acute respiratory illness, acute gastroenteritis and acute febrile illness. The average duration of stay required in between 7 to 15 days and most children admitted to the NRC show moderate rate of weight gain. Socioeconomically, severe acute malnutrition appears to be more prevalent among households belonging to middle and lower middle class, and where educational status of parents both mother and father is low. Poor housing condition, presence of overcrowding and nuclear family structure were also seen among these children.

Poor feeding practices like delay in initiating breast feeding, low proportion of children getting the colostrum, and lesser proportion being given exclusive breast feeding also seem to be more among these children suffering from severe acute malnutrition. Immunization although seen in fair number of children is still not universal and can be one of the contributing factors for malnutrition.

Recommendations:

Severe acute malnutrition continues to be a public health problem in India. Age group of 1-2 years is mostly affected so timely follow-ups are recommended to be done by grass root health care workers. Educating the parents about infant feeding practices and importance of immunization also needs to be done. More penetration on government housing schemes like Indira Awas Yojana should be

encouraged as better living conditions along with supply of clean and treated piped water for drinking purposed reduces the chances of children falling ill and getting trapped in the vicious cycle of poverty and malnutrition. At the institutional level parents should be encouraged to follow-up the children at the healthcare facility for proper management.

Declaration:

Funding: Nil

Conflicts of interest: Nil

Acknowledgement:

Authors express gratitude to the staff and functionaries of the Nutritional Rehabilitation centre for their support and cooperation.

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