

Original Research Article

A cross sectional study to find out the magnitude of “at risk” children (showing growth faltering/decline) among under-five population attending anganwadi centres in Bhopal district, Madhya Pradesh

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ABSTRACT

Background: In our country the state of under-nutrition was recognized/diagnosed too late or not at all, and therefore the effort to alleviate undernutrition was also delayed. The timely recognition of “at risk” children (showing growth faltering/decline) liable for undernutrition can avert wasting; stunting and prevent severe malnutrition due to concomitant infections and other complications.

Methods: A community based cross-sectional study was carried out in urban and rural area of Bhopal district, Madhya Pradesh, among under-5 children attending anganwadi centres. All the children enrolled among selected urban and rural AWCs were taken as study population. Primary information regarding “at risk” children (showing growth faltering/growth decline) was obtained by reviewing last one year growth monitoring records available.

Results: There were total 10 anganwadi centres visited and growth monitoring record of last one year was analysed. There were total 1230 children enrolled in anganwadi centres under study. As per the available record we found that 416 (33.82%) of the total children enrolled in the anganwadi centres under study were “at risk” of malnutrition. The magnitude of at risk children was almost double in the urban area (43.24%) as compare to the rural area (23%). This difference was found statistically significant. Gender wise distribution of “at risk” children shows that there is marginal difference in the magnitude of “at risk” status among boys (34.57%) and girls (33.06%) and similar difference was found in urban and rural anganwadi centres under study.

Conclusions: The study conclude that children belong to 2 to 4 year age group are “at risk” of under nutrition. Both the genders are equally susceptible of under nutrition though children belong to urban area had more risk as compare to rural area.

Keywords: At risk child, Growth faltering, Growth decline, Undernutrition, ICDS, Bhopal

INTRODUCTION

Malnutrition is the most widespread condition affecting the health of children. Scarcity of suitable foods, lack of purchasing power of the family as well as traditional beliefs and taboos about what the baby should eat, often lead to an insufficient balanced diet, resulting in

malnutrition.¹ Any child is considered “at risk” of malnutrition if he/she was present with any one or more of the factors like, low birth-weight, multiple pregnancies: twins, triplets, birth order of five and above, pregnancy in the mother before the child is 9 months old, recent measles, whooping cough, diarrhoea or other serious illness, history of malnutrition or death in a

sibling, lack of weight gain in the last 2 months, social problems: (a) Illegitimate or abandoned child, or a one-parent family (b) Unemployment, chronic illness or alcoholism in a parent (c) Socially deprived ethnic groups.²

Malnutrition is called an “invisible” emergency because, much like iceberg, its deadly menace lies mostly hidden from view.³ It refers to a pathological state resulting from a relative or absolute deficiency or excess of one or more essential nutrients.⁴ In the current time the three indices - weight-for-age, height/length-for age, weight-for-height/length are used to identify three nutrition conditions: underweight, stunting and wasting, respectively. Each of the three nutrition indicators is expressed in standard deviation units (Z-scores) from the median of the reference population based on which under nutrition may be further classified as moderate or severe. Under nutrition is by far the most important and single cause of illness and deaths globally, accounting for 12% of all deaths and 16% of disability-adjusted life year lost.⁵

It is primarily due to (a) an inadequate intake of food (food gap) both in quality and quantity, and (b) infections notably diarrhoea, respiratory infections, measles and intestinal worms which increase requirements for calories, protein and other nutrients, while decreasing their absorption and utilization. It is a vicious circle – infection contributing to malnutrition and malnutrition contributing to infection, both acting synergistically.⁶ Malnutrition is a man-made disease which often starts in the womb and ends in the tomb. It is associated with increased morbidity, growth faltering, developmental retardation and significant mortality. A number of studies have also demonstrated a relationship between growth status, school performance and intellectual achievement.⁷

India is home to the largest number of children in the world, significantly larger than the number in China. The country has 20 per cent of the 0-4 years’ child population of the world.⁸ The prevalence of child under nutrition in India is among the highest in the world; nearly double that of Sub-Saharan Africa, with dire consequences for morbidity, mortality, productivity and economic growth.⁹ In India 20 per cent of children under five years of age suffer from wasting due to acute under nutrition, 43% are underweight and 48 per cent (i.e. 61 million children) are stunted.¹⁰ In Madhya Pradesh as per NFHS-4, 42% of children of under-five age group are stunted, or too short for their age, which indicates that they have been undernourished for some time. 25% are wasted, or too thin for their height, which may result from inadequate recent food intake or a recent illness. 42.8% are underweight, which takes into account both chronic and acute undernutrition.¹¹

There is a great opportunity of preventing and treating under nutrition in children attended by anganwadi workers and the health workers during growth monitoring and acute illnesses. These children missed during this

period will eventually develop under nutrition in the due course of time. It could have been prevented by the health worker and the anganwadi workers in the early stage by home based care and by providing proper information to care takers/mothers on proper nutrition during sickness and recovery.⁵

Need of the study

The timely recognition of “at risk” children (showing growth faltering/decline) liable for under-nutrition can avert wasting; stunting and prevent severe malnutrition due to concomitant infections and other complications. In our country the state of undernutrition was recognized/ diagnosed too late or not at all, and the effort to alleviate under-nutrition was also delayed.¹² Studies on attributes responsible for under five malnutrition are available both at global and national level but reliable data on the magnitude of “at risk” children (showing growth faltering/decline) and related factors is not available. Thus there is a need to study the magnitude of “at risk” children and related factors with their “at risk” status so as to develop strategy and/or interventions for primary prevention of under nutrition.

Objective

- To find out the magnitude of “at risk” children among under-five population attending anganwadi centres in Bhopal district, MP.

METHODS

Study design

It was a community based observational study.

Area of study

The urban and rural ICDS projects of Bhopal district.

Duration of study

The study was conducted over a period of one year that is from July 2014 to June 2015.

Study population

The target population in the urban setting was the under-five children population attending anganwadi centres while in the rural setting it was the under-five children population attending anganwadi centres of rural ICDS block of Bhopal district.

Sampling frame

It consisted of all under-five children attending anganwadis in the above mentioned areas.

The sample unit

Sampling unit was an under-five child.

Sampling method and sample size

Bhopal district has a total of 10 ICDS projects (3 rural and 7 urban) and these 10 ICDS project consist of total 1618 anganwadi centres. One ICDS project was selected by simple random sampling from urban area and one from rural area. From the above selected urban and rural ICDS project, 5 anganwadi centres from each project was selected by simple random sampling. There were total 10 anganwadi centres visited and growth monitoring record of last one year was analysed. There were total 1230 children enrolled in anganwadi centres under study, which provide us a sample size of 1230.

Inclusion criteria

All under five children, who are “at risk” i.e. showing growth faltering or decline and all those children who developed undernutrition during the study period were included as study subjects. These children were enrolled from the selected anganwadi centres and included only when mothers were willing to participate in the study.

Exclusion criteria

Exclusion criteria were children whose mothers are not willing to participate and healthy children attending anganwadi centre and seriously ill children.

Study tools

Two types of instruments were used: a structured questionnaire and anthropometric measurements including weight, height and MUAC.

Data source and method of data collection

Data collection was started after obtaining clearance from ethical committee and respective authorities of ICDS scheme in Bhopal district. Primary information regarding “at risk” children (showing growth faltering and decline) was obtained by reviewing last one year growth monitoring record, available at anganwadi centres. There were total 10 anganwadi centres visited and growth monitoring record of last one year was analysed. There were total 1230 children enrolled in anganwadi centres under study. Growth monitoring records of all these children were analyzed to find out magnitude of “at risk” children.

Data analysis

Data was managed by entering it into MS office. Data was analyzed using Epi-Info software for windows (Version 3.5.4. CDC, Atlanta, USA). Chi-square test was

applied as test of significance wherever required. A p-value < 0.05 is considered as statistically significant.

Ethical consideration

- Children were enrolled in the study after taking informed consent from their caregivers.
- Children and their caregivers had full liberty to leave the study at any point of time without affecting their services from anganwadi centres.
- Full confidentiality of data was maintained throughout the study.

RESULTS

There were total 10 anganwadi centres visited and growth monitoring record of last one year was analysed. There were total 1230 children enrolled in anganwadi centres under study Urban anganwadis had more no. of children as compare to rural anganwadis. The ratio of boys and girls was found to be equal among enrolled children and same trend was observed in rural and urban area (Table 1). As per the available record we found that 416 (33.82%) of the total children enrolled in the anganwadi centres under study were “at risk” of malnutrition. The magnitude of at risk children was almost double in the urban area (43.24%) as compare to the rural area (23%) as shown in the above table. This difference was found statistically significant ($p \leq 0.001$) (Table 2). Gender wise distribution of “at risk” children shows that there is marginal difference in the magnitude of “at risk” status among boys (34.57%) and girls (33.06%) and similar difference was found in urban and rural anganwadi centres under study (Table 3). Out of 416 “at risk” children we were able to contact 305, out of them 192 children belongs to urban anganwadi centres and 113 children belong to rural anganwadi centres. Among the study subjects 145 were boys (47.54%) and 160 were girls (52.46%) (Table 4). Among overall “at risk” children, maximum (30.82%) belongs to 25 to 36 months age group. In the urban area maximum number of “at risk” children belong to 25-36 months (34.9%) age group and in the rural area maximum number of “at risk” children belong to 49-60 months (31.9%) age group (Table 5). Most of the mothers of “at risk” children were illiterate in urban (31.8%) as well as rural (33.6%) areas (Table 6). Maximum “at risk” children belong to fourth socio economic class (51.8) as per the Prasad’s socio economic classification. Both urban and rural study subjects follow the same pattern with 52.1% and 51.3% respectively. Only one “at risk” child from the rural area belongs to first class (Table 7). Among overall “at risk” children, 8.5% have less than one year birth interval with the previous child and all such study subjects belongs to urban area. In the rural area none of the “at risk” children had less than one year birth interval. Only 13.1% of the “at risk” children have the ideal birth interval of three years. The desired birth interval of three years is better (26%) in rural area as compare to the urban area (13%) (Table 8).

Table 1: Residence and gender wise distribution of children enrolled among AWCs under study.

Gender	Urban area (n=659)		Rural area (n=571)		Total children (n=1230)	
	n	%	n	%	n	%
Male	335	50.83	281	49.21	616	50.08
Female	324	49.17	290	50.79	614	49.92

Table 2: Magnitude of "at risk" children in urban and rural anganwadi centres under study. Five AWCs in each area were covered.

AWCs under study	Total children enrolled in selected AWCs	Total "at risk" children	%
Urban anganwadi centres	659	285	43.24
Rural anganwadi centres	571	131	23
Total	1230	416	33.82

Chi-square test was applied. Chi-square value 56.4. $P \leq 0.001$

Table 3: Residence and gender wise distribution of "at risk children" in the anganwadi centres under study.

AWCs under study	Boys enrolled in selected AWCs	Boys "at risk" (%)	Girls enrolled in selected AWCs	Girls "at risk" (%)
Urban anganwadi centres	335	154 (46)	324	131 (40)
Rural anganwadi centres	281	59 (21)	290	72 (24.83)
Total	616	213 (34.57)	614	203 (33.06)

Table 4: Distribution of "at risk" children as per gender and place of residence (n=305).

Gender	Urban area (n=192)	%	Rural area (n=113)	%	Total (n=305)	%
Boys	93	48.43	52	46.01	145	47.54
Girls	99	51.56	61	53.99	160	52.46

Table 5: Distribution of "at risk" children as per age group and residence (n=305).

Age in months	Urban area (n=192)	%	Rural area (n=113)	%	Total (n=305)	%
1-12	3	1.6	4	3.5	7	2.30
13-24	20	10.4	13	11.5	33	10.82
25-36	67	34.9	27	23.9	94	30.82
37-48	53	27.6	33	29.2	86	28.20
49-60	49	25.5	36	31.9	85	27.87
Total	192	100	113	100	305	100

Table 6: Distribution of mothers of "at risk" children according to educational status in urban and rural area (n=305).

Mother's education	Urban area (n=192)	%	Rural area (n=113)	%	Total (n=305)	%
Illiterate	61	31.8	38	33.6	99	32.5
Primary	60	31.3	25	22.1	85	27.9
Middle	47	24.5	29	25.7	76	24.9
High school	12	6.3	14	12.4	26	8.5
12th	10	5.2	5	4.4	15	4.9
Graduate	2	1	2	1.8	4	1.3

Table 7: Distribution of "at risk" children according to socio-economic status (Prasad's classification) (n=305).

Socio economic status	Urban area (n=192)	%	Rural area (n=113)	%	Total (n=305)	%
I	0	0	1	0.9	1	0.3
II	19	9.9	7	6.2	26	8.5
III	56	29.2	34	30.1	90	29.5
IV	100	52.1	58	51.3	158	51.8
V	17	8.9	13	11.5	30	9.8

Table 8: Distribution of "at risk" children as per the birth interval with previous child (n=199).

Birth interval	Urban area (n=123)	%	Rural area (n=76)	%	Total (n=199)	%
< 1 year	17	13.8	0	0	17	8.5
< 2 year	50	40.7	43	56.6	93	46.7
< 3 year	40	32.5	23	30.3	63	31.7
> 3 year	16	13	10	13.2	26	13.1

DISCUSSION

The magnitude of "at risk" children was obtained by analysing the last one year growth monitoring records of selected AWCs. There were total 10 anganwadi centres were selected, five each from one urban and one rural ICDS blocks of Bhopal district. There were total 1230 children enrolled in the selected anganwadi centres, 659 in the urban anganwadi centres and 571 in the rural anganwadi centres. There were total 616 boys and 614 girls among the total enrolled children (Table 1).

After analysing the last one year growth monitoring record of selected anganwadi centres in urban and rural area, we obtained the magnitude of "at risk" child was 33.82% (Table 2). Children showing growth faltering and decline for two consecutive months and those children who were not gaining weight as per the age were considered as "at risk" child. When we compared the urban and rural areas it was found to be more prevalent in the urban areas (43.24%) then the rural areas (23%). Gender wise prevalence of "at risk" child was almost similar as 34.57% and 33.06% respectively (Table 3). We were not able to find out any relevant research in the available literature related to "at risk" child concept of ICDS scheme therefore we were not able to compare our study findings with other studies.

Out of the total 1230 children enrolled in various anganwadi centres under study, we selected 416 children who were "at risk" of malnutrition. We were able to contact 305 mothers of "at risk" children because rest of the children (111) were either out of station or changed their residence at the time of visit.

Out of the total 305 "at risk" children 192 belongs to urban anganwadi centres and 113 belongs to rural anganwadi centres. 145 (47.54%) were boys and 160 (52.46%) were girls. The proportion of "at risk" girls was slightly higher in urban and rural anganwadi centres as 51.56% and 53.99% compared to "at risk" boys 48.43% and 46.01% respectively (Table 4). Among overall "at risk" children, maximum (30.82%) belongs to 25 to 36 months age group. In the urban area maximum number of "at risk" children belongs to 25-36 months (34.9%) age group and in the rural area maximum number of "at risk" children belongs to 49-60 months (31.9%) age group (Table 5).

Most of the mothers (32.5%) of "at risk" children were illiterate and similar pattern was observed in urban

(31.8%) as well as rural (33.6%) area. 31.3% mothers in urban area and 22.1% mothers in the rural area were only had primary education. These two categories together represent that 60.4% of mothers of "at risk" children either had no education or primary education and due to this reason mothers were not able to understand the concept of malnutrition and its prevention (Table 6). Even though they were repeatedly taught by AWWs about concept of growth monitoring they were not able to implement it and it leads to delay in the identification of children "at risk" of malnutrition. Sengupta et al, Mishra et al, Nale et al and Harishankar et al also reported significant relationship between mother educational status and malnutrition among under five children.¹³⁻¹⁶ Basit et al did not find out significant association between care takers/mothers educational status and malnutrition.¹⁷

In our study maximum numbers of "at risk" children were belong to fourth socio economic class (51.8) as per the Prasad's socio economic classification, followed by third socio economic class and fifth socio economic class (Table 7). Similar pattern was observed in urban and rural area. Similar to our observations Patel et al, Viramgami et al, Gupta et al and Patel et al also found that lower socio economic class had significantly higher prevalence of undernutrition.¹⁸⁻²¹ However Ahmad E et al found that lower socio economic class is not significantly associated with undernutrition among under-five children.²²

In our study we found that 76.9% of "at risk" children had birth interval below the ideal one that is of three years as per National family welfare programme. From these "at risk" children 46.7% had birth interval of less than 24 months and 8.5% had less than one year birth interval with the previous child. The pattern of birth interval was almost similar in urban and rural area except for less than one year interval as all such "at risk" children belongs to urban area. Only 13.1% of the study subjects have the ideal birth interval of three years or more.. The desired birth interval of three years is similarly present in rural (13.2%) and the urban area (13%) (Table 8). Similar to our observation National Family Health survey III shows that 48% children were malnourished when interval between two pregnancies was ≤ 24 months compared to 40% malnourished children when interval between two pregnancies was > 36 months. Significant association between birth interval and undernutrition was also reported by Shahjada et al, Israt Rayhm et al, Nale et al and Patel et al.^{23-26,16}

CONCLUSION

The study conclude that children belong to 2 to 4 year age group are “at risk” of undernutrition. Both the genders are equally susceptible of undernutrition though children belong to urban area had more risk as compare to rural area. Majority of “at risk” children lives in nuclear families thus facing problem of proper care and adequate nutrition where the mother was involved in any kind of occupation. More than half of the mothers were illiterate and due to this they were not able to catch the various nutrition and health education messages displayed in AWCs or spread through multimedia by various government agencies. Most of the “at risk” children belong to IV class as per Prasad’s socio-economic classification thus reemphasize the importance of earning capabilities of family members also responsible for the risk of undernutrition, better earning families have less risk of undernutrition among their under five children. More number of siblings and low birth interval among siblings are other important factors that put them “at risk” of undernutrition.

Limitations of the study

We were not able to find out any association between the dependent and independent variables as there was no control available in our study. It was a descriptive study so we could only hypothesize that our observations may be the factors behind the “at risk” status of the children.

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