Original Research

Prevalence of stunting and wasting among Anganwadi school children of rural and urban area of Central India: A cross-sectional study

Chaitanya R Patil, Sushama S Thakre, Mohan B Khamgaonkar, Subhash Thakre

Department of Community Medicine, Indira Gandhi Government Medical College, Nagpur, Maharashtra, India.
Correspondence to: Chaitanya R Patil, E-mail: docterchaitanya@gmail.com

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Abstract

Background: Malnutrition is an important public health problem which involves infants and children. It is a self-perpetuating problem which affects the mental and physical development of the child. The basic tool to quantify this burden is growth assessment in the form of anthropometry which is done under a national program called Integrated Child Development Services (ICDS).

Objectives: The present study was conducted to review and compare the prevalence of stunting and wasting, in rural and urban central India.

Materials and Methods: A cross-sectional study was conducted on rural (*n*=100) and urban (*n*=100), Anganwadi children for two months. All Anganwadi children (3-6 years) who were available at the time of examination and children below three 3 years of age at house visit were included in the study. Children with congenital defects were excluded from the study. A pretested and predesigned questionnaire was used to collect the data. Height and weight were measured according to standard guidelines. Data was analyzed using Epi Info version 7.

Results: In our study, the prevalence of stunting was found to be 37% and 22% in rural and urban areas respectively. The prevalence of wasting was found to be 33% and 20% in rural and urban areas respectively. There was a significant difference between grades of stunting (p=0.01) and wasting (p =0.05) among rural and urban children.

Conclusion: In spite of the efforts taken by the government to cut down the rates of stunting and wasting through various programs, the effects of malnutrition still persists.

KEY WORDS: Stunting, Wasting, Anganwadi children, Central India

Introduction

Malnutrition is an important public health problem which involves infants and children. It is a self-perpetuating problem which affects the mental and physical development of the child.[1] Malnutrition, poverty, and the associated diseases constitute the triad for the viscous cycle, which increases the morbidity and mortality in the vulnerable age groups.[2] One such age group which is most affected is infants and children.

The basic tool to quantify this burden is growth assessment in the form of anthropometry which is done under a national program called Integrated Child Development Services (ICDS).[3] Though the services provided by the scheme are same throughout, the trends of urban and rural setup differ in terms of Socioeconomic, Environmental and cultural factors affecting the nutritional care of the children. A review was done on the secular trends of undernutrition in rural Maharashtra which inferred there has been a significant reduction in stunting and wasting rates[4] India, during 1985-2001. Anthropometric data collected on preschool (<6 years old. But still, there is a gap to be covered in terms

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of decreasing the prevalence. National Family Health Survey (NFHS-4) data summarizes that in the state of Maharashtra the prevalence of stunting and wasting was 34.4% and 25.6% respectively. Further the report briefs about the differences in urban and rural proportions of stunting and wasting.[5]

Many studies have been conducted in urban, semi-urban and rural areas separately. But there exists a paucity of data in comparing rural and urban areas.[4,6-19] With this background, the present study was conducted to review and compare the prevalence of stunting and wasting in rural and urban central India.

Materials and Methods

Rural adopted area of Indira Gandhi Government Medical College is Hingna which is 20km from the college having 16 Anganwadi centers and urban adopted area is Maya Nagar which is 5 km from college having 10 Anganwadi centers. Selection of Anganwadi centers was done randomly by taking a list of both urban and rural area from the concerned Child Development Officer. This community-based cross-sectional study was carried out for two months (January 2015- February 2015) in the Anganwadi centers thus selected.

All Anganwadi children (3-6 years) who were available at the time of examination and children below three 3 years of age at house visit were included in the study. Children with congenital defects were excluded from the study.

Data was collected from mothers and Anganwadi teachers. House visit was done for the children below 3 years of age and for children between 3-6 years of age, it was collected at the Anganwadi center. A pre-tested and pre-designed questionnaire was used which included socio-demographic parameters like age, sex, address, educational status of head of the family and, socio-economic status and anthropometry which included height or length and weight of the children.

Age of the child and literacy status of the head of the family was categorized based on the classification as in census 2011.[20] The socio-economic status was classified based on BG Prasad Scale.[21] Expected weight and height were calculated by the respective formulae.[22,23]

Where Children could not stand on the weighing scale, the weight of the child was measured by subtracting the mother's weight, from mother along with baby weight taken by the digital weighing scale. For the children who could stand, the weight was measured directly. Care was taken that the child didn't move or lean forward and took any support during the measurement.[24] Weight was recorded in kilograms.

Similarly, the length of children was measured by an infant meter and height by the height chart. While measuring the length of the child, care was taken for the head to be stabilized to the stagnant part and legs held at the level of knees by the mother, while the measurement was recorded by the moving part. Height was taken by making the child stand in front of the height chart, heels together with buttocks and the shoulders touching the wall on which the height chart was applied. Then the measurement was taken by keeping a vertical scale over the highest point of the child's head.[24] It was recorded in centimeters to the nearest 0.1 centimeters.

A pilot study was conducted on 20 children before the start of this study. The prevalence of wasting was found to be 13% in urban areas and 29% in rural area. With 80% power, 0.05 alpha error and the above proportions, the minimum sample size was found to be 95 in each group. The sample size was further extended to 100 for the convenience.

The data was entered in MS EXCEL and analyzed by Epi Info version 7.1. Qualitative data was expressed in percentages. Chi-square/ Fishers' exact test were used to observe the difference between proportions. $P<0.05$ was considered significant.

Results

Out of the hundred children from the rural area, 46% were males and 54% were females. In rural Anganwadi children, the 0-3 years (55%) was most common age group; mothers were educated up to middle school (49%) and 49% of the families were from lower middle class, according to BG Prasad Classification.

Similarly, from the urban area, 52% were males and 48% were females. In rural Anganwadi children, the 3-6 years (56%) was most common age group; mothers were educated up to middle school (52%) and 55% of the families were from lower middle class according to BG Prasad Classification.

Table 1: Socio-demographic correlates of the children

Socio-demographic correlates	Rural (*N*=100)	Urban (*N*=100)
Gender		
Male	46	52
Female	54	48
Age group(years)		
0-3	55	44
3-6	45	56
Educational status of mother		
Illiterate	5	8
Primary	2	9
Middle	49	52
High school	36	22
Intermediate/post high school diploma	4	5
Graduate/ Post graduate	5	4
Post graduate	0	0
Socio-economic status		
Upper	8	6
Upper middle	20	16
Lower middle	49	55
Upper lower	8	7
Lower	15	16

In our study, the prevalence of stunting was found to be 37% and 22% in rural and urban areas respectively. The prevalence of wasting was found to be 33% and 20%, in rural and urban areas respectively.

(Figure 1) shows the distribution of study subjects based on the grades of stunting. Of 100 rural Anganwadi children 63% were normal, 17% were mild, 13% were moderate and 7% were severely stunted. Similarly, in urban Anganwadi children, 78% were normal, 12% were mild, 10% were moderate and none were severely stunted. We found a significant difference between the stunting grades of rural and urban, Anganwadi children (p=0.01).

(Figure 2) shows the distribution of study subjects according to the grades of wasting. Upon grading the rural children, 4% were under the severe category, 6% under the moderate category, 23% of mild category and 67% were normal.

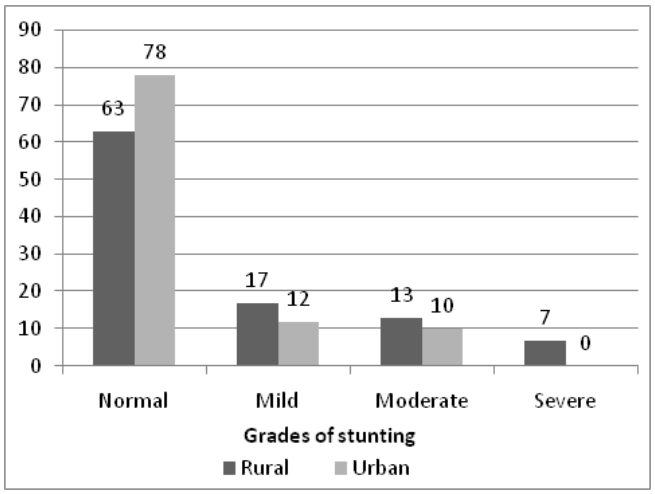

Figure 1: Distribution of study subjects according to grades of stunting

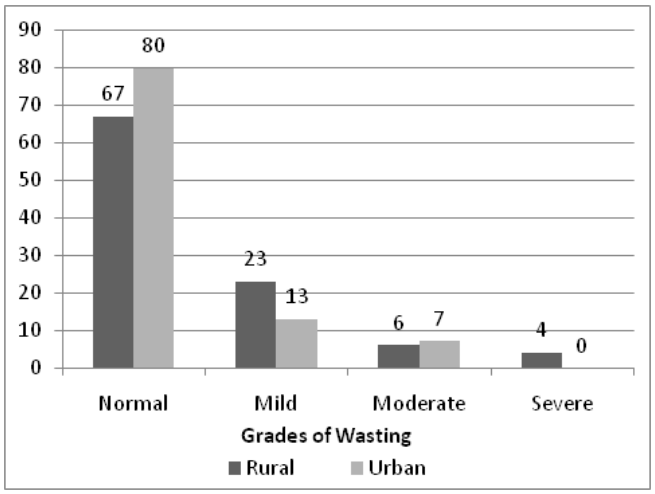

Figure 2: Distribution of study subjects according to grades of wasting

Similarly, 80% were normal, 13% in mild, 7% in moderately and none were severely wasted in the urban area. However, this difference was found to be statistically significant (p=0.05).

Discussion

Millennium Development Goals (MDGs) report 2013 briefs that, one in eight people worldwide still does not consume enough food on regular basis and the majority of undernourished ones live in developing countries.[25]

Our study findings reveal that magnitude of stunting was 37% and 22% in rural and urban areas respectively. Studies conducted by Imran et al,[13] Shibulal et al,[10] Patel KA et al[16] strength, and intellectual vitality is laid during this period. Globally, more than one-third of the child deaths are attributable to under-nutrition. The discriminatory attitudes against female children vary from being implicit to those that are quite explicit. So, the present cross-sectional study aims to assess the nutritional status (gender differences and Patel PP et al[6] showed the prevalence of stunting in urban areas to be 27%, 39.5%, 48.7% and 67.36% respectively. Another study conducted by Deshmukh et al[17] cumulative inadequacies of health and nutrition. Health system uses underweight for growth monitoring for its simplicity. Lately there is renewed interest in stunting and especially severe acute malnutrition. Stunting is a relatively neglected indicator. It is therefore imperative to understand the causes of stunting early in infancy and childhood, so that preventive measures can be taken. Hence, the present study was undertaken to study the social determinants of stunting in rural Wardha. Methods: The present cross-sectional study was undertaken in three Primary Health Centres (PHCs in rural Wardha reported a prevalence of 52.2% of stunting. A study conducted in Ethiopia by Gashu et al[14] showed the prevalence of stunting to be 41.4% in rural area.

In our study in the rural area, the grades of stunting were 17% mild, 13% moderate and 7% severe and the same in an the urban area were 12% mild and 10% moderate, and none were severely stunted. In a study by Patel KA et al[16] strength, and intellectual vitality is laid during this period. Globally, more than one-third of the child deaths are attributable to under-nutrition. The discriminatory attitudes against female children vary from being implicit to those that are quite explicit. So, the present cross-sectional study aims to assess the nutritional status (gender differences conducted in western Maharashtra, the stunting grades were found to be 52.02% and 15.34% as mild and poor respectively which were higher when compared to our study.

Our study findings reveal that magnitude of wasting was 33% and 19% in rural and urban areas respectively. In a study conducted by Surwade et al,[15] it was found that the prevalence of wasting was 46.6% and 55.56% in urban and rural areas respectively. Similar studies conducted independently in urban areas by Avachat et al[8] found the prevalence to be 50.46%. Mitra et al[18] conducted a similar study in urban slums of Kolkata found the prevalence to be as high as 61.61%.

One of the studies conducted on wasting in a rural area of West Bengal was based on Mid-Upper Arm Circumference (MUAC) for age as the screening criteria. It inferred with the prevalence of 62.8%, which is higher than that of our study. This higher prevalence can be attributed to the sensitivity of MUAC to screen the wasting in children. In another study conducted by Meshram et al[12] in tribal rural areas, the prevalence found was 51%.

The limitation of this study was low sample size. So the results cannot be generalizable to the total population. The same type of study can be made possible with a large sample size and get to know the probable causes that are leading to a difference in urban and rural areas. Another limitation of the study was the crude formulae used to calculate the expected height and weight.

Conclusion

In spite of the efforts taken by the government to cut down the rates of stunting and wasting through various programs, the effects of malnutrition still persist. Our study specifically pointed out the significant difference in rates of stunting and wasting among rural and urban, Anganwadi children. Therefore, we recommend that monitoring of the services provided to both rural and urban areas. Surveys and studies can be conducted on the knowledge, attitude, and practices about the importance of anthropometry among the peripheral health workers and strengthening their knowledge through repeated follow-up workshops. Compliance studies of the beneficiaries over the quality of food provided, medications for severely malnourished children and surveillance done over the Anganwadi workers on the work they do, should be carried out to address this significant gap.

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