

## Original Research Article

# Morbidity profile and nutritional status of tribal under five children attending the phulwaris in rural Chhattisgarh

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**Received:** 02 July 2019

**Revised:** 15 August 2019

**Accepted:** 17 August 2019

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## ABSTRACT

**Background:** According to UNICEF report, 19.8% children under-five years in India are wasted, 48% are stunted and 42.8% are underweight. Multisectoral initiatives by the national and state governments are yet to reduce the burden of malnutrition. Jan Swasthya Sahyog (JSS) Health Centre in Chhattisgarh, plays a vital role in improving nutritional status of tribal under- three children attending the phulwaris (or creches). Objectives of this study were to assess the nutritional status of under-five children attending the phulwaris located under Bamhni sub center and to identify the common morbidities among these children.

**Methods:** The researchers conducted health check-up for 357 children in the 19 phulwaris of Bamhni sub center spread over 16 villages.

**Results:** Mean age of children attending the phulwaris was found to be 29±12.5 months. Among the 357 children, 128 (35.9%) were underweight; 53 (14.8%) were severely underweight; 35 (9.8%) were wasted; 18 (5%) were severely wasted; 58 (16.2%) stunted and 16 (4.5%) severely stunted according to WHO growth charts for weight for age, weight for height and height for age respectively. Point prevalence of morbidity was 142 (39.7%), which included respiratory tract infection (24.6%); scabies (8.4%); otitis media (3.1%); pyoderma (2.2%); developmental delay (2.2%); worm infestation (2.2%); sickle cell anemia (0.6%) and (0.3%) had epilepsy.

**Conclusions:** Under nutrition was still prevalent among the children attending the phulwaris and upper respiratory tract infection was the most common morbidity.

**Keywords:** Tribal, Under-five, Anganwadis, Malnutrition, Respiratory tract infection

## INTRODUCTION

India with 1.3 billion people is the second most populous country in the world, 39% of this population being children under 18 years.<sup>1</sup> Under five children contribute to almost ten percent of this population.<sup>2</sup>

Children are like wet cement; whatever falls on them makes an impression. They are considered to be the

vulnerable part of the community. The most important age group being 6 months to 3 years, from the period of weaning till they start going to school. Their nutritional status is a sensitive indicator of health. Growth during childhood is used as a marker to assess health, nutrition and their future development.<sup>3</sup> Malnutrition is the underlying cause for 45% disease burden and 3.5 million deaths globally among children under five years of age.

Most of these deaths occur in the low and middle-income countries.<sup>4,5</sup>

According to 2012 data by UNICEF, in India 19.8% children under five years are wasted, 48% are stunted, 42.8% are underweight and 1.9% are overweight or obese.<sup>6</sup> Reduction in malnutrition is a multisectoral activity. There have been several attempts made by the national and state governments to tackle malnutrition. India has the privilege of implementing the largest program for children as early as 1975, Integrated Child Development Services (ICDS). Nutritional inequalities in different states of India are increasing and a major shortcoming of ICDS program is that it failed to effectively reach the children under three years of age.<sup>7</sup> Children under three years of age are especially prone to malnutrition and need an extra focus since most of them cannot feed on their own.<sup>8</sup>

Jan Swasthya Sahyog (JSS) Health Centre is located in Ganiyari, Chhattisgarh and its community health programs are accessed by people from surrounding 2500 villages of north and central Chhattisgarh and eastern Madhya Pradesh for their health needs. A vital part of the JSS activity is to improve the nutritional status of children under three years of age utilizing the local resources and these centers are called phulwaris (or creches).

Phulwaris were initiated with the objectives of giving care, supplementary nutrition and non-formal education to children. The care-takers (phulwari workers) are women from the same village who has some formal education and has interest in taking care of the children. The selected phulwari workers undergo training at JSS. Each worker is in charge of running the phulwari at her home and will take care of a maximum of 10 children.

In the phulwari, every child will be fed one meal and two heavy snacks (sattu) every day which provides approximately 70% of daily calorie requirement. In addition, each child gets 10 ml of oil per day and an egg twice weekly. Iron supplements (3 mg/kg) are given twice weekly and deworming is done at least once in six months. Emphasis is laid on cleanliness of both the caretaker and the children, especially about hand washing practices. Growth monitoring of the registered children are done monthly, minor ailments are treated immediately and for major ailments, the children are either referred to JSS or examined by a visiting doctor.

The indirect benefits of phulwari includes supplementing family income as mother can continue working, elder sibling can continue education, encourage learning in children during early years. Phulwari functions for eight hours a day, for six days per week. Phulwari worker is monitored by a supervisor and a coordinator. During the monthly meetings of phulwari workers, supervisors and coordinators the functioning of phulwari will be reviewed, supplies replenished and phulwari workers

would undergo training on a specific health topic and all their queries would be answered.

### **Objectives**

The objectives of this study were to assess the nutritional status of under five children attending the phulwaris under Bamhni sub center and to identify the common morbidities among these children during this health appraisal.

### **METHODS**

Permission for conducting the study was obtained from the management of JSS Health Centre, Chhattisgarh. The list of all the phulwaris located in Bamhni sub center along with their location was obtained. A schedule was planned regarding the days of visit to the phulwaris and the caretakers were informed about the dates of visit in advance.

#### **Inclusion criteria**

All children in the age group six months to five years attending the phulwaris under Bamhni sub center.

#### **Exclusion criteria**

Children who were absent on the day of health appraisal.

#### **Sample size**

Based on the study done in rural Pondicherry, taking prevalence of morbidity among under five children to be 27%, fixed precision as 5% and confidence interval of 95%, the sample size calculation was as follows:<sup>9</sup>

$$n = \frac{z^2(p \times q)}{d^2}$$

There were 357 children who met our inclusion criteria and all these children were included.

Health check-up was undertaken by the researchers, supported by the supervisor and the caretaker over a period of five days in the month of November 2017. Total of 19 phulwaris spread over 16 villages of Bamhni sub centre were covered. Around 65 to 75 children were examined per day in the phulwaris after obtaining verbal informed consent from the caretaker of phulwari who had already taken consent from parents of children attending her phulwari. Totally 357 children were examined.

#### **Study tools**

The child health card contained information regarding date of birth of the child, monthly anthropometry (height, weight) recordings and other socio demographic details. The following information related to health was also available-developmental milestones, disabilities if any,

presence of sickle cell gene, nutritional status (marked on WHO growth charts) and past history of any illness or surgeries.

On the day of the visit to phulwaris, the children were examined in detail which included both general-physical and systemic examination, weight for the children which was measured using Salter hanging scale and height was measured using stadiometer or infantometer or non-stretchable measuring tape.

The data collected was entered in Microsoft excel and analyzed using standard statistical packages (IBM SPSS version 16). Sociodemographic details of the children, malnutrition status and morbidities were calculated and proportions were expressed as percentages. Chi-square test was used to test association, p value less than 0.05 was considered to be significant.

## RESULTS

In this cross-sectional study, 357 children between six months to five years attending the phulwaris in Bamhni sub centre area were examined. Mean age of children attending the phulwaris was found to be  $29 \pm 12.5$  months. Majority of children 136 (38%) belonged to the age

group of two to three years, 176 (49.3%) were females and 181 (50.7%) of them were males as depicted in Table 1.

**Table 1: Sociodemographic profile of study population (n=357).**

Variables	Frequency	%
<b>Age group (in months)</b>		
6-12	28	7.8
13-24	102	28.8
25-36	136	38
37-48	63	17.6
49-69	28	7.8
<b>Sex</b>		
Male	181	50.7
Female	176	49.3

Among the 357 children, 128 (35.9%) were underweight and 53 (14.8%) were severely underweight; 35 (9.8%) were wasted and 18 (5%) were severely wasted; 58 (16.2%) stunted and 16 (4.5%) severely stunted according to WHO growth charts for weight for age, weight for height and height for age respectively. 2 (0.6%) children were found to be overweight.

**Table 2: Nutritional status of the study population (n=357).**

Characteristics	Total	Boys	Girls
<b>Weight for age</b>	<b>N (%)</b>	<b>N (%)</b>	<b>N (%)</b>
Normal	176 (49.3)	94 (51.9)	82 (46.6)
Underweight	128 (35.9)	64 (35.3)	64 (36.3)
Severely Underweight	53 (14.8)	23 (12.7)	30 (17)
<b>Weight for height</b>			
Normal	302 (84.6)	151 (83.4)	151 (86.8)
Wasted	35 (9.8)	19 (10.5)	16 (9.1)
Severely wasted	18 (5)	11 (6.1)	7 (4)
<b>Height for age</b>			
Normal	283 (79.3)	151 (83.4)	132 (75)
Stunted	58 (16.2)	23 (12.7)	35 (19.9)
Severely stunted	16 (4.5)	7 (3.9)	9 (5.1)

**Table 3: Morbidities in the study population (n=357).**

Morbidities	Frequency	%
<b>Respiratory tract infections</b>	88	24.6
<b>Scabies</b>	30	8.4
<b>Ear infections</b>	11	3.1
<b>Worm infestation</b>	8	2.2
<b>Developmental delay</b>	8	2.2
<b>Pyoderma</b>	8	2.2
<b>Sickle cell disease</b>	2	0.6
<b>Epilepsy</b>	1	0.3

Based on gender, among the malnourished children, 94 (53.4%) were girls and 88 (48.4%) were boys. This difference was not statistically significant ( $p=0.33$ ) (Table 2).

With respect to morbidity, 142 (39.7%) children had at least one morbidity, commonest being the respiratory tract infection (24.6%). Other morbidities seen were scabies (8.4%), otitis media (3.1%), pyoderma (2.2%), developmental delay (2.2%) and worm infestation (2.2%). On review of records, (20.6%) children had sickle cell anemia and 1 (0.3%) child had history of epilepsy. Morbidity profile of the children is described in Table 3.

## DISCUSSION

The study included 357 children, 182 boys and 175 girls between six months to five years of age. Though the phulwaris were run for the children up to three years, we noticed that children up to the age of six years were

present. This was mainly due to the non-availability of anganwadis and inaccessibility of schools to most children in this region. Many of the villages had more than one phulwari to make it easily accessible and not more than 10 children per phulwari, because the caretaker could dedicate and give her full attention to the children in her phulwari.

The grave problem of malnutrition among these rural children is wisely being tackled by the team at JSS Health Centre by providing supplementary nutrition at the phulwaris. A giant leap in the nutritional status and reduction in the common morbidities have occurred due to well-planned balanced meal and timely supply of medications and other supplements at the phulwari by the supervisors.

Prevalence of malnutrition in this study was lesser as compared to the studies conducted among children in other rural areas of the country by Birdi et al and Manjunath et al.<sup>3,4</sup> According to a study in a tribal region of Maharashtra, malnutrition was found to be highly prevalent among all age groups with 54% of children among one to five years.<sup>4</sup> The prevalence of malnutrition was low compared to the Bilaspur district level (26.8%) and also state level (23.7%).<sup>10,11</sup> The reduced rate in this study is a direct reflection of the calorie replacement done by the JSS team at the phulwaris.

A drastic reduction in the malnutrition rates has not yet been achieved. Most of the women in these tribal villages have been employed under the National Rural Employment Guarantee Act.<sup>12</sup> So many of the mothers leave their children in the phulwaris in the early morning itself and they were not able to adequately feed the children at home. These parents would have completely relied on the phulwari for nutrition of their children.

Nutritional status of under five children living in an informal urban settlement in Nairobi, Kenya showed that 47% were stunted, 11.8% were underweight and 2.6% were wasted. 58% of the malnourished children were of the age group 36 to 47 months.<sup>13</sup>

A study done among the preschool slum children in Lucknow reported respiratory (17.2%) and diarrhea (6.3%) as the major morbidities.<sup>14</sup> Sambo et al studied under five children in a semi urban area in Nigeria and reported that fever, cough (44.8%) and diarrhea (43.8%) accounted to the major cause of illness among under five children.<sup>15</sup> Respiratory illness in rural areas of Pondicherry was reported as 53.7% in a study conducted among under five children by Kumar et al.<sup>9</sup>

A study conducted on the tribal under five children of tea estates in Darjeeling, West Bengal, morbidity was noted among 74 of 192 children and major morbidities were diarrhea (26%), acute respiratory infections (24.5%) and fever (16.7%) and 64.4% children were underweight.<sup>16</sup>

A study was done among the under five children in an urban primary health centre of Pondicherry. Among 164 children studied, 23.8% and 30% children reported illnesses in the past 15 days and 30 days respectively and the most common illness reported was respiratory infection.<sup>17</sup>

In our study also, respiratory illness (24.6%) was the most common illness accounted and majority of them had upper respiratory tract infection.

A multi-centric study done on the spectrum of skin diseases among Indian children showed bacterial infections (58.09%) and scabies (21.54%) as the most common infections.<sup>18</sup> Our study showed very low incidence of scabies (8.4%) and pyoderma (2.2%). This could be due to the emphasis on hygiene at the phulwaris and awareness created by the care takers among parents of children attending the phulwaris.

The sickle gene is wide spread among the tribal population in India with the prevalence varying from 1 to 40 percent.<sup>19</sup> Sickle cell disease was present in 2 (0.6%) children in this study.

## CONCLUSION

Malnutrition was still prevalent among the study population. Respiratory illness, particularly upper respiratory tract infection was the most common morbidity among the children in the phulwaris.

Few interventions done include children identified with Severe acute malnutrition (SAM) were referred to JSS centre for further management. Children with Moderate acute malnutrition (MAM) were identified and the phulwari caretakers were advised to give special attention to these children like, providing an extra meal, treatment of infections if any, and supplements for micronutrient deficiencies. Children with minor ailments were treated.

## Limitations

Prevalence of diarrhea was under estimated, as the phulwari workers had stressed on the fact that children with diarrhea were asked not to attend phulwari till they had recovered, in order to avoid spread of infection. The children who were absent on the day of examination (could be due to diarrhea) were excluded from the study.

## ACKNOWLEDGEMENTS

We thank all the phulwari workers, supervisors and the entire team at JSS Health Centre for helping us through the study.

*Funding: No funding sources*

*Conflict of interest: None declared*

*Ethical approval: The study was approved by the Institutional Ethics Committee*

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**Cite this article as:** Dishani MR, Kannan R, Philip R, Ramesh N, Jain Y, Mohite A. Morbidity profile and nutritional status of tribal under five children attending the phulwaris in rural Chhattisgarh. *Int J Community Med Public Health* 2019;6:4077-81.