

Nutritional Status of Women and Children in Select Areas of Jharkhand

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Abstract

This study was conducted as part of Gene Campaign's work on understanding food and nutrition security in rural India.

The objective of the study was to determine the prevalence of malnutrition of women and children in Jharkhand, India and to investigate the relationship between mother and child nutritional status and the association between use of Anganwadi resources and mother and child nutritional status.

The study was undertaken in December 2010 and January 2011. Data was collected from two districts of Jharkhand: Hazaribagh and Ranchi. 8 villages in Ranchi and 11 villages in Hazaribagh. 282 women and 239 children were included in the study.

To assess nutrition status anthropometric measurements of women and children and dietary evaluation of women were used. Data on child and mother use of Anganwadi resources was collected by questionnaire answered by the mother.

Anthropometric indices were calculated from measurements. For children the anthropometric indices were BMI for age, height-for-age, and weight-for-age. These indices can be expressed in terms of z-scores, which enable comparison of a child with a reference population. For women body mass index (BMI) was used.

Chi square tests were done to evaluate relationships between variables.

Results showed that there is a significant relationship between family size and mother and child's nutritional status. Surprisingly there was no difference in health status between girls and boys and no significant relationship between mother and child health status. Overall our results showed a higher prevalence of malnutrition than the NFHS-3 India report. This is likely due to Jharkhand being a state that is substandard in nutritional status.

Introduction

The National Family Health Survey 05-06 (NFHS-3) gives statistics of the nutritional status of women and children of India. According to the NFHS-3, 43 percent of children under age five years are underweight for their age (WAZ<-2SD) and 48 percent of children under age five years are stunted (HAZ<-2SD). NFHS-3 shows that 36% of all

women age 15-49 in India are underweight (BMI <18.5). And that girls and boys 0-35 months were about equally likely to be underweight. The girls having slightly better health status.

The Indian government has implemented the Integrated Child Development Services (ICDS) Scheme to improve the health status of the women and young children. This involves supplying mothers with Take Home rations (THR) twice monthly. They also receive iron tablets during pregnancy and lactation. Women get THR and iron tablets from local Anganwadi. The other aspect of ICDS scheme is supplying children at the Anganwadi with a meal 5 days of the week.

The objective of the study was to determine the prevalence of malnutrition of women and children in Jharkhand, India. Also to investigate the relationship between mother and child nutritional status and the association between use of Anganwadi resources and mother and child nutritional status.

The hypothesis: that there will be a significant relationship between mother and child nutritional status. That use of Anganwadi resources will cause a greater difference between mother and child nutritional status.

Study Methodology

Sampling

Data was collected from two districts Hazaribagh and Ranchi. In total 282 women and 239 children were included in the study. In Ranchi data was collected from the Anganwadi in 8 villages of Angara block. In Hazaribagh Data was collected from two locations, Chikutura and Kijiri. Women and children from local villages came to these villages to be measured. Data was collected in the form of questionnaire, and by taking measurements.

Questionnaire

Information on Diet and access to Anganwadi resources was based on a questionnaire. It involved the following questions:

Do you feel hungry: never, sometimes, or always?

When you were pregnant did you take the iron tablets?

Does your child eat at the Anganwadi?

Do you get Take home rations?

Collection of anthropometric measurements

Each woman's weight, height and waist circumference were measured. Each child was checked for oedema and weight, height, abdomen circumference and head circumference were measured.

Oedema

Bipedal oedema indicates severe malnutrition. A child with oedema has to be counted as below <-3 SD for all weight-related indicators. It was important to measure for bipedal oedema as the weight of retained fluid increases the Child's weight. This masks what would otherwise be low weight value. Oedema is measured by pressing the thumb down on the top of the child's foot gently for 30 seconds. The child has oedema if a dent remains in the foot after lifting the thumb.

Anthropometric Indices

Anthropometric indices were calculated from the anthropometric measurements using WHO Anthroplus software. These indices are necessary, as for example, weight alone does not signify nutritional status unless related to the individual's age or height. For children the anthropometric indices were: Body mass index for Age Z-scores (BAZ), Height-for-Age Z-scores (HAZ), and Weight-for-Age Z-scores (WAZ). These indices allow comparison between children of different ages.

Low Height-for-Age Z score (HAZ) indicates 'stunting.' It is a good indicator for chronic undernutrition as it does not vary according to short term factors, such as illness. It signifies poor environmental conditions.

Body Mass Index (BMI) is used to compare weight to height ratio of different individuals. BMI is calculated by dividing the weight in kilograms by the height in meters squared. BMI-for-Age Z score (BAZ), compares BMI of child with the BMI of children of the same age. Children who have low BAZ are described as being 'wasted'. Wasting is also sometimes called global undernutrition or global acute malnutrition (GAM).

Low weight-for-age (WAZ) indicates the child is underweight. Low WAZ may reflect wasting or stunting. This general property makes WAZ a good indicator for nutritional status (Onis & Blössner, 2003).

Z scores are in reference to The WHO Child Growth Standards (2011) median

BAZ <-2 SD indicates wasting.

BAZ <-3 SD indicates severe wasting.

HAZ <-2 SD indicates stunting

HAZ <-3 SD indicates severe stunting

WAZ <-2 SD indicates undernutrition.

WAZ <-3 SD indicates severe undernutrition.

(Physical Status...,1995).

The WHO growth reference is based on an international group of children. This is appropriate as a comparison group, as all children grow similarly when their health needs are met. Also any difference in growth between ethnicities is minor compared to the effect of environment. (Physical Status...,1995).

For women body mass index (BMI) was used. BMI indicates an adult's health status. BMI was calculated by dividing the weight in kilograms by the height in meters squared. For adults BMI values are age-independent and the same for both sexes. However different populations have different body proportion which means the same BMI of people in different nations may have different nutritional status (WHO Global Database).

BMI classifications for Asian adults are as follows:

Severe thinness, BMI < 16.00 (kg/m²)

Moderate thinness, BMI = 16.00 - 16.99 (kg/m²)

Mild thinness, BMI = 17.00 - 18.49 (kg/m²)

Healthy weight, BMI = 18.5-22.9 (kg/m²)

Overweight, BMI > 23 (kg/m²)

The WHO international cut-offs are the same with the exception of the cut-off for overweight being > 25 (kg/m²)

Exclusion of Data

Waist circumference, weight and BMI of pregnant women was excluded. And Children with WAZ, HAZ, or BAZ less than -6.0 or greater than 6.0, were excluded when analyzing data.

Data Analysis

WHO AnthroPlus Software, was used to calculate anthropometric indices. SPSS 19 was used to create frequency table, histograms and chi square tests.

Results

Results have been presented in 3 categories: Children's data, Mother's data, and combined mother and child data. This involves comparisons between the mother and one of her children. If more than 1 child was measured per mother, then the child would be selected at random.

Mother's Data

General Demographics of Sample Group

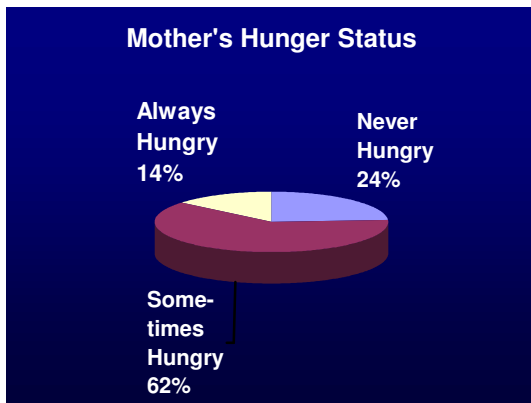
Of the 282 women participating in the study, about 1% of women were of the General caste. 27% were OBC (Other backwards caste), 33% were SC (Scheduled Caste), and 77% were ST (Scheduled Tribe)

About 17% of women have family size of 2-3 members, about 39% have a family size of 4-5 members, and about 44% have a family size of 6 or more members.

Anganwadi Participation

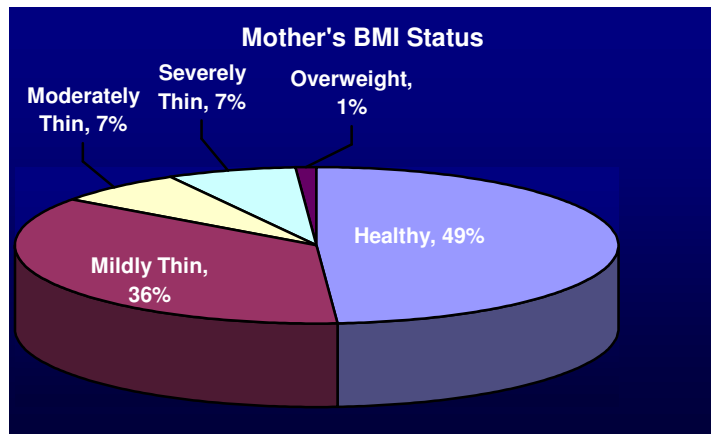
The women in the study predominantly participated in the Anganwadi scheme. About 12% of eligible women don't receive Take Home Rations (THR) whereas 88% do receive THR. About 28% of eligible women didn't receive iron tablets from the Anganwadi, and 72% did receive iron tablets.

Hunger and Body Mass Index Status



About 24% of women claimed to never be hungry, 62% claimed to sometimes be hungry, 14% claimed to always be hungry.

Of all of the women, 7% of women were severely thin, 7% were moderately thin, 36% were mildly thin, 49% were a healthy size, and 1% was overweight.



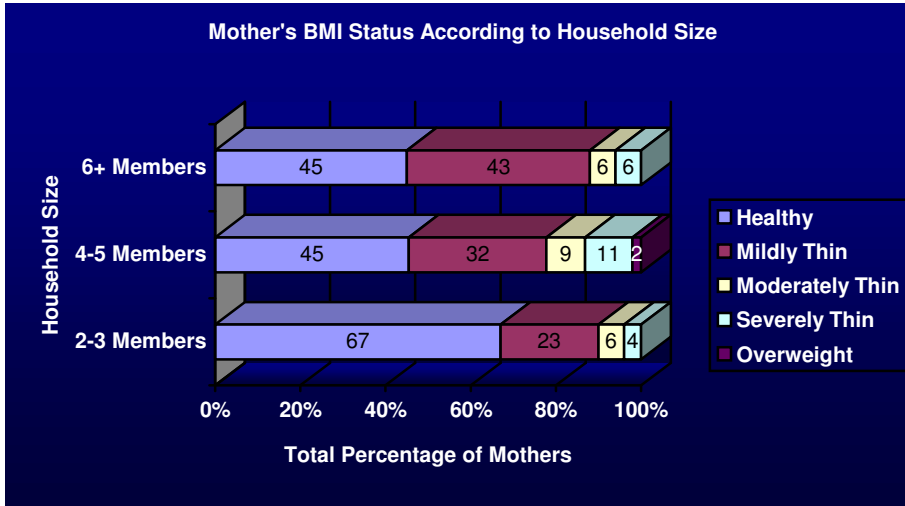
Women's BMI by Anganwadi Participation

For eligible women that did not receive THR, 12% were severely thin, 4% were moderately thin, 35% were mildly thin, 50% were a healthy weight, and none were overweight.

Of the women that did receive THR, 4% were severely thin, 10% were moderately thin, 36% were mildly thin, 49% were a healthy weight, and 1% was overweight.

Mother's BMI by Household Size

For families of 2-3 members, 4% of women were severely thin, 6% were moderately thin, 23% were mildly thin, 67% were a healthy weight, and none were overweight.



For families of 4-5 members, 11% of women were severely thin, 9% were moderately thin, 32% were mildly thin, 45% were a healthy weight, and 2% were overweight. For families of 6 or more members, 6% of women

were severely thin, 6% were moderately thin, 43% were mildly thin, 45% were a healthy weight, and none were overweight.

The Chi square test below shows there is a statistically significant relationship between family size and woman's BMI. This is shown by $P < 0.05$, P values are under the category 'Sig.' The relationship suggests that women who have larger families have smaller BMI. This is as expected as less food is available for these women.

Children's Data

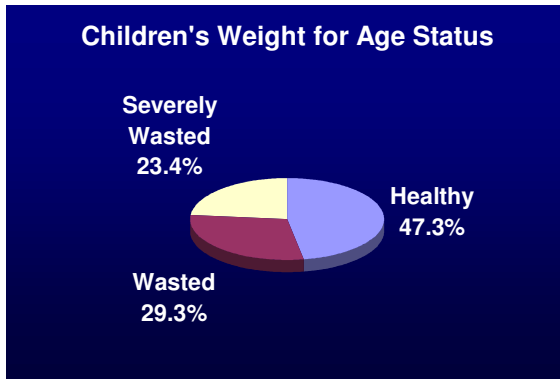
General Demographics of Sample

Of the 239 children who participated in the study, about 47% were female and 53% were male. About 2% of children in sample were of the General caste. 12% were OBC 15% were SC and 71% were ST. About 30% of children were under 1 year old. About 44% were 1-3 years old. About 27% were between 3 and 6 years old.

Anganwadi Participation

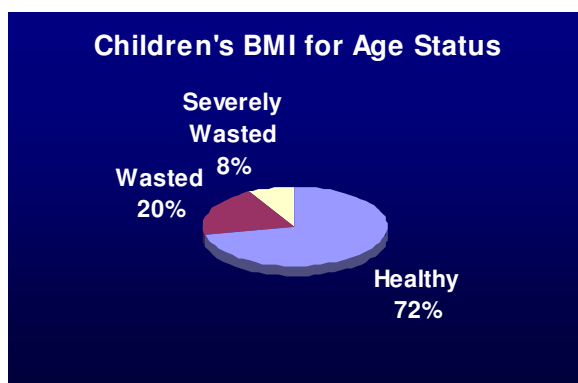
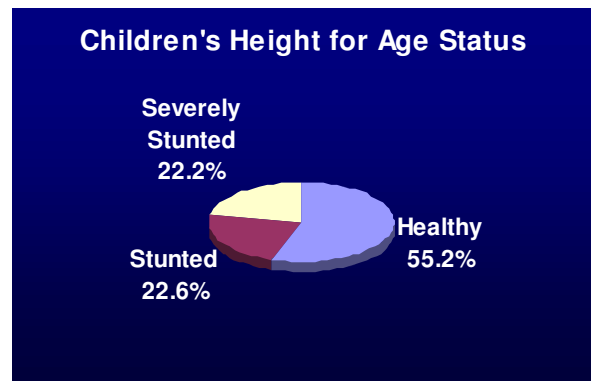
92.3% of eligible children eat at the Anganwadi. Only 7% do not eat at the Anganwadi.

Anthropometric Measures



About 47% of children are a healthy weight for age. 29% are wasted and 23% are severely wasted. The mean Weight for Age Z-Score was -2.1. This fits in the category of undernourished.

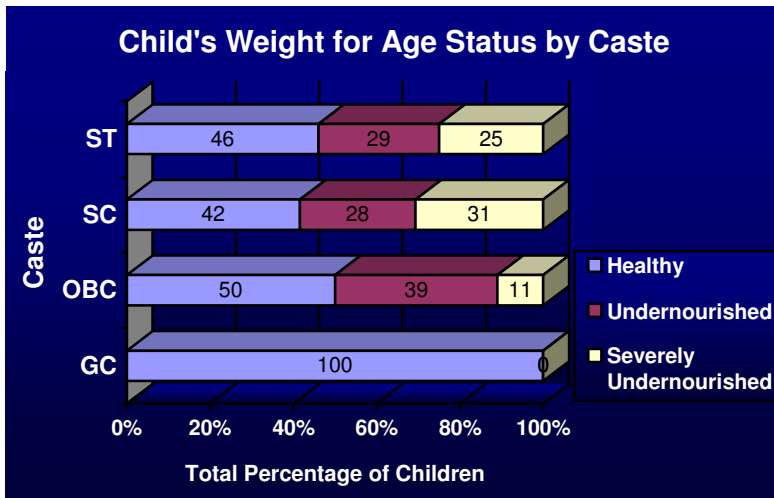
About 55% of children are a healthy height for age. 22% of children are stunted, 23% are severely stunted. The mean Height for Age Z-Score was -1.8, which is just inside the 'healthy' category.



72% of children have a healthy BMI for age. About 20% are undernourished and 8% are severely undernourished. The mean BMI for Age Z-Score was -1.3 which is in the 'healthy' category.

Anthropometric Measures by Caste

Weight for Age

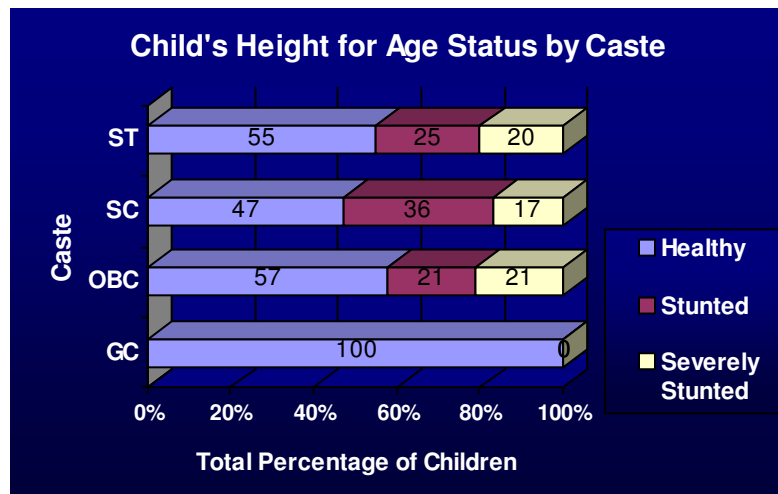


For general caste 100% of children were a healthy weight, but it must be taken into account that only 4 children were in this category. For OBC about 11% of children were severely undernourished, 39% were undernourished and 50% were a healthy weight. For SC, 31% of children were severely undernourished, 28% were undernourished and 42%

were a healthy weight. For ST, 25% of children were severely undernourished, 29% were undernourished, and 46% were a healthy weight.

Height for Age

For general caste 100% of children were a healthy height, take note; only 4 children in this category. For OBC about 21% of children were stunted, 21% were severely stunted and 57% were a healthy height. For SC, 16.7% of children were stunted, 36% were severely stunted and 47% were a healthy height. For ST, 25% of children were stunted, 20% were severely stunted, and 55% were a healthy height.



For ST, 25% of children were stunted, 20% were severely stunted, and 55% were a healthy height.

Combined mother and child data

Anthropometric Measures by Mother's Anganwadi Participation

Of the eligible women that don't receive THR, 8% of their children were severely undernourished, 15% were undernourished, and 77% of children were a healthy weight. Of the women that did receive THR, 25% of their children were severely undernourished, 30% were undernourished, and 45% of children were a healthy weight.

Of the eligible women that didn't receive THR, 15% of their children had severe stunting,

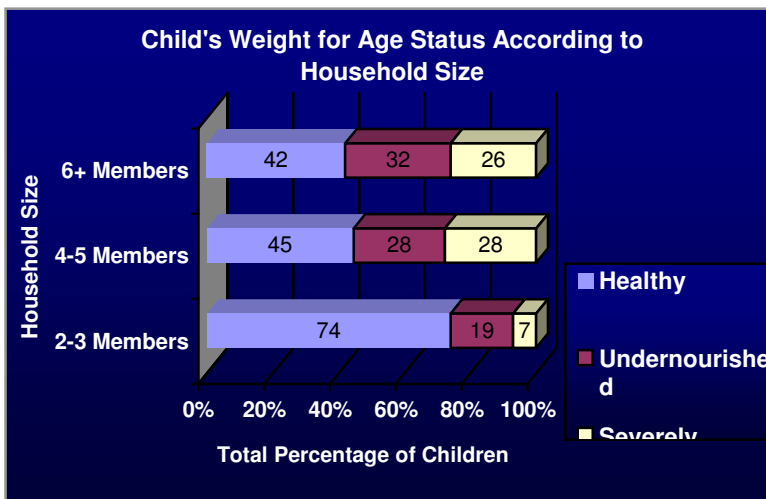
0% had stunting, and 85% of children were a healthy height. Of the women that did receive THR, 24% of their children had severe stunting, 26% had stunting, and 51% of children were a healthy height.

Of the eligible women that don't receive THR, 0% of their children were severely wasted, 8% were wasted, and 92% of children were a healthy size. Of the women that did receive THR, 10% of their children were severely wasted, 22% were wasted, and 68% of children were a healthy size.

Anthropometric Measures by Family Size

Weight for Age

Of families with 2 or 3 members 7% of children were severely undernourished, 19% were undernourished, and 74% of children were a healthy weight.



Of families with 4 or 5 members 28% of children were severely undernourished, 28% were undernourished, and 45% of children were a healthy weight.

Of families with 6 or more members 26% of children were severely undernourished, 32% were undernourished, and 42% of children were a healthy weight.

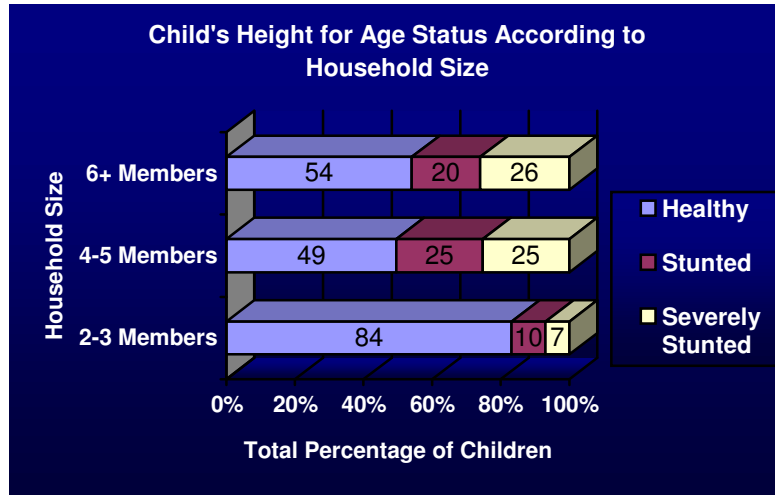
The Chi square test below shows there is a statistically significant relationship between Family size and child's WAZ grade. This is shown by $P < 0.05$, P values are under the category 'Sig.' The relationship is that increasing family size = increasing undernourished children.

Height for Age

Of families with 2 or 3 members 7% of their children had severe stunting, 10% had stunting, and 84% of children were a healthy height.

Of families with 4 or 5 members 25% of their children had severe stunting, 25% had stunting, and 49% of children were a healthy height.

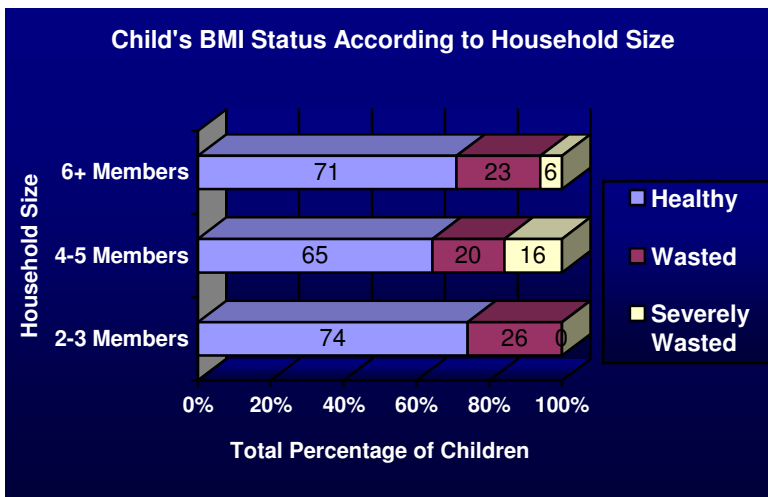
Of families with 6 or more members 26% of their children had severe stunting, 20% had stunting, and 54% of children were a healthy height.



The Chi square test below shows there is a statistically significant relationship between Family size and child's HAZ grade. This is shown by $P < 0.05$, P values are under the category 'Sig.' The relationship is: with increasing family size there are more stunted children.

BMI for Age

Of families with 2 or 3 members 0% of their children were severely wasted, 26% were wasted, and 74% of children were a healthy size.



Of families with 4 or 5 members 16% of their children were severely wasted, 20% were wasted, and 65% of children were a healthy size.

Of families with 6 or more members 6% of their children were severely wasted, 23% were wasted, and 71% of children were a healthy size.

The Chi square test below shows there is a statistically significant relationship between Family size and child's BAZ grade. This is shown by $P < 0.05$, P values are under the category 'Sig.' The relationship is: with increasing family size there is increasing wasted

children.

Discussion

Prevalence of malnutrition

According to the National Family Health Survey 3 2005-2006 (NFHS-3) India, 43 percent of children under age five years are underweight for their age (WAZ<-2SD) And 48 percent of children under age five years are stunted (HAZ<-2SD). Our data showed 53 percent of children under age six years are underweight for their age (WAZ<-2SD) and 45 percent of children under age six years are stunted (HAZ<-2SD).

NFHS-3 shows that 36% of all women age 15-49 in India are underweight (BMI <18.5.) In comparison, our results shows 50% of women were underweight. The NFHS-3 found girls and boys 0-35 months were about equally likely to be underweight. The girls having slightly better health status. Our results had similar findings.

Overall our results showed a higher prevalence of malnutrition than the NFHS-3 India report. This is likely due to Jharkhand being a state that is substandard in nutritional status.

Significant relationships

Not many relationships between variables were significant. Surprisingly there was no significant difference in nutritional status between girls and boys. A contributing factor may be that the food supplied to children by the Anganwadi is the same for both sexes.

Also unexpected was the lack of a significant relationship between mother and child nutritional status. This could be due to the child eating at the Anganwadi, independently from the mother. This making the nutritional status of mother and child less related.

Results showed that there was a significant relationship between family size and woman's BMI. The relationship suggests that women who have larger families have a smaller BMI. Also there was a significant relationship between family size and children's WAZ, HAZ and BAZ. The relationship is, that with increasing family size there is an increase in undernourished, stunted and wasted children. These results are as expected.

Results showed a significant relationship between women who receive THR, and their hunger status. The relationship suggests that women, who do not receive THR, are less likely to be hungry. This is contrary to the expected results. The results may be due to bias. Women may not have been honest about their hunger status. Also the sample size of women not receiving THR was small, only 26 women in total.

There was a significant relationship between the mothers that receive THR and their child's HAZ. The relationship suggests that women that don't receive THR, have children with a healthier height for their age. This is unexpected. The result may be due to small sample size.

Errors in study

My sample may not have been a true representation of Jharkhand population. I collected most of my data from Anganwadi. Most of the children I measured used Anganwadi resources. My data suggests that children who used Anganwadi resources had better nutritional status. The questionnaire may not have been answered honestly, due to embarrassment or pressure from others. Also errors in translation may have caused inaccuracies. Some children became agitated when being measured, causing errors in recorded measurements.

References

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