

Malnutrition among under-five tribal children with special focus on dietary intake in Akole block of Western Ghat, Maharashtra, India

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ABSTRACT

Background: Malnutrition is a global issue that affects billions. The social and economic backwardness has always been responsible for poor health status, high incidence of low birth weight, and infant and child mortality among these groups. In India, many recent studies have been conducted on the nutritional status of tribal children and have showed a high rate of malnutrition. **Objectives:** (1) To study various factors contributing to the malnutrition among tribal children and (2) to study the dietary habits of under-five children and its impact on nutritional status. **Materials and Methods:** A community-based cross-sectional study was conducted in tribal area of Akole block of Western Ghat, Maharashtra, India, from February 2016 to June 2017. A total of 370 under-five tribal children were studied from 13 selected villages. Pretested structured questionnaire was used to collect data. Anthropometric measurements such as height/length and weight were measured. The World Health Organization-2006 child growth standards were used to three grades: Underweight, stunting, and wasting. The data were compiled and statistical analysis was done using percentage and Chi-square test. **Result:** Of 370 children, 170 (45.9%) were males and 200 (54.1%) were females. Overall, the prevalence of underweight, stunting, and wasting was found to be 86.2%, 72.3%, and 58.6%, respectively. Severe underweight, stunting, and wasting were found in 18.9%, 26.2%, and 7.6%, respectively. **Conclusion:** The present study demonstrates that children in Akole tribe are at high risk of malnutrition. Malnutrition continued to be a substantial burden in under-five children.


KEY WORDS: Dietary Intake; Malnutrition; Sociodemographic Factors; Tribal Population

INTRODUCTION

Malnutrition is most widespread condition affecting the health of child.^[1] It most often refers to undernutrition resulting from inadequate consumption, poor absorption, or excessive loss of nutrients; additionally, the term also encompasses over nutrition, resulting from excessive intake of specific nutrients.^[2] Malnutrition is characterized as a pathological condition resulting from lack of energy and

proteins in different proportions, which can be aggravated by repeated infection.^[3] Malnutrition includes being stunted (low height-for-age [HAZ]), wasted (low weight-for-height [WHZ]), and underweight (low weight-for-age).^[4]

The terms malnutrition, protein-energy malnutrition, and undernutrition are often used interchangeably.^[5] It kills, maims, cripples, and blind on a massive scale worldwide. Malnutrition affects one in every three people worldwide, afflicting all age groups and population, especially the poor and vulnerable. It leads approximately 10.4 million annual child deaths in developing world; it continues to be a cause and consequences of disease and disability in the children who survive. In addition to medical disorder, malnutrition is also a big social problem rooted in poverty and discrimination.^[6]

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In developing countries, it is serious public health problem and most important risk factor for the burden of disease causing about 300,000 deaths per year directly or indirectly responsible for more than half of all deaths in children.^[7] Recent reports from India documents that 43% children under 5 years age are underweight. This includes 43% moderate-to-severe cases, 16% severe malnutrition, of these, 20% have moderate-to-severe wasting, and 48% moderate-to-severe stunting.^[8] According to 2011 census, 84,326,240 of India's population is tribal population. Maharashtra is the second most populous state of India in case of tribals with a tribal population of 85,77,276.^[9]

According to the World Health Organization (WHO) (1948), health is a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity.^[10] Health status is one important criteria of human development. Good status of health is unavoidable right of every citizen. Millennium development goals have been set during millennium summit held in New York in September 2000. There are eight goals such as eradication of poverty and improve welfare of people. Of these eight goals, the first one is to eradicate poverty and hunger and the fourth one is to reduce child mortality. Anita (1998) has stated that even though there are clear directives from International health bodies still the health condition of children (0-6 years) is worst.^[11] In India, in spite of several government services and schemes, millions of children suffer from both acute and chronic malnutrition.^[11]

According to Global Hunger Index 2008, India scored 23.7 points and was placed 66th among 88 countries. Pande has stated that malnutrition report in 2012 suggests that 59% of country's children could have stunted growth and 42% could be underweight.^[12] The World Bank Report (1999) has reported that India ranked (47% children malnourished) as second only to Bangladesh (48%) with highest number of underweight children in the world, which is nearly double than that of sub-Saharan Africa (24%), with dire consequences of mobility, mortality, productivity, and economic growth.^[13] According to hunger and malnutrition report, 50% children under five in the country are underweight and 42% children in the same age group are suffering from malnutrition. This report also highlighted that one of the three malnourished children in the world is the Indian.^[14]

Wrong weaning practices, superstitions, illiteracy, low age at marriage, low weight at birth, and malnutrition are major contributing factors responsible for infant and child mortality. To stop these evil deaths, government is implementing several schemes such as mid-day meal, integrated child development scheme, and Rajmata Jijau Mother-Child Health and Nutrition Mission.^[15]

Tribal people are more superstitious, illiterate, traditional, and poor all these become obstacles in their development.

Uncertain mode of employment, economic instability leads to poverty, which makes them victims of morbidity and malnutrition. Therefore, the present study was conducted with an aim to study malnutrition among tribal children under five with special focus on dietary intake in Akole block of Western Ghat, Maharashtra.

MATERIALS AND METHODS

Study Area

The study was conducted from February 2016 to June 2017 in different villages of Akole taluka in Ahmednagar district of Maharashtra state. It is an area which comes under Western Ghat of Maharashtra called Sahyadri. The tribal population in this is relatively large number of tribals, namely, Mahadevkoli, Thakars, Bhils, and Ramoshies. They speak dialects of Marathi language. Their major occupation is agriculture. The tribal population is around 3,15,745 in 191 villages of Akole taluka with literacy rate around 59.15%.

Sampling

According to the study of nutritional status of under-five children belonging to tribal population living in Visakhapatnam district, Andhra Pradesh, the prevalence of malnutrition is 39.53% which was the average of underweight (60.2%), stunting (27.1%), and wasting (31.3%).^[16] Sample size was estimated using Z^2pq/d^2 formula where p was 39.53%. A confidence interval of 95% was taken into account for sample size determination. Using the statistical formula for comparative studies, a sample size of 370 households was used and systematic random sampling was done in the selection of under-five tribal children.

Data Collection

The respondent was the mother of the child. A verbal consent was taken from the mother of the reference child before interview. The data were collected through interview technique, and anthropometric measurements of the under-five children were taken manually. Necessary help in translation and interviewing the respondents has been taken from the field worker.

Anthropometry

Anthropometric measurements (weight and length/height) of the children were taken recorded and analyzed. The sociodemographic features of population under study were assessed using structured questionnaire. The procedure followed in taking anthropometric measurements was as per the United Nations and using the World Health Organization child growth charts/standards 2006. Z scores (weight-for-age, HAZ, and WHZ) were classified by the WHO.^[17]

Data Analysis

First, the data checked for completeness and consistency. The data were coded and entered into Microsoft Excel 2010. It was analyzed using SPSS version 21. Nutritional grade of the child was done using the WHO-2006 growth charts/standards. Frequency, percentage, and test of significance (Chi-square test) were performed wherever it was appropriate.

Ethical Consideration

Ethical clearance was obtained from Institutional Ethics Committee of Pravara Institute of Medical Sciences (Deemed University), Loni. Verbal consent from mothers of study subjects was obtained and the objective of the study was explained to them. Desire of the participants was highly appreciated, they were not forced. Participation was fully voluntarily in this study.

RESULTS

Of 370 under-five tribal children of Akole block studied, 170 (45.9%) were males and 200 (54.1%) were females. All the respondents were scheduled tribes. In terms of religion, 99.5% were Hindu and only 0.5% was Muslim.

A total of 64.3% mothers were illiterate, 34.1% were primary level, and only 1.1% had secondary level education. Higher secondary level education was hardly seen among mothers. It was observed that majority of the mothers were farmers (47.6%), followed by labors (38.6%), housewives (10%), self-business (3.2%), and private job (0.5%), respectively. It was revealed that 60.3% mothers had their family income between Rs 1000 and 3000, 25.9% had Rs <1000, 13% had Rs 3000–5000, and only 0.5% had a monthly family income above Rs 5000.

Only 25.7% mothers had one child, 45.4% mothers had two children followed by 18.6% mothers with three children, 7.3% mothers were having four, 2.7% mothers had five children, and 0.3% mothers were having six children. Majority (98.6%) children were born in full-term gestational age of 9 months. Of 370 children, 97.8% of mothers received vaccination during pregnancy. Only 38.4% mothers had visited 3 times for antenatal checkup (ANC) and 53% women had at least two ANCs, whereas remaining 32 (9%) never went for ANC checkups.

A total of 94.6% mothers had taken iron and folic acid (IFA) tablets during pregnancy. It is reported around 75.1% of children was delivered at home and only 24.9% children were delivered at hospital. Milk (99.2%) followed by all vegetables (98.9%) was the most common food consumed by the mothers during pregnancy. Majority of mothers (60.3%) did not report any difficulty/stress/illness during pregnancy, whereas a total of 39.7% mothers suffered difficulty/stress/illness during pregnancy. Among these,

74.15% were anemic, 9.52% were diabetic, and breast problems were reported by 9.52% mothers. Hypertension during pregnancy was reported by 6.12% mothers and only 1 (0.68%) had thyroid-related medical problem during pregnancy.

All the children were fed with colostrum after birth. Among the under-five children, 50%, 42.7%, and 4.9% frequency of breastfeeding was 6–8 times per day, every 2 h (10–12 times in a day), and 4–5 times per day, respectively. In addition to breastfeeding, 17.8% children received pre-lactation food. The type of pre-lactation food was water with sugar 41.2%, honey 55.9%, and jiggery water 2.9%. Of 370 children, 13.6% children were started with supplementary feeding at the age before 6 months. However, 85.8% of children started supplementary feeding after 6 months of age.

Among the study subjects, 141 (40.1%), 128 (36.4%), 80 (22.7%), and 3 (0.8%) children given messed rice, cattle milk, messed wheat, and messed maize, respectively. Regarding method of feeding, majority of children who were started supplementary feeding were used by hand 219 (62.2%), bottle 100 (28.4%), cup 19 (5.4%), and spoon 14 (3.9%). Concerning Vitamin A supplementation, 338 (91.4%) children were supplemented with Vitamin A. However, 15 (4.1%) were not supplemented and 17 (4.6%) children mothers did not know whether they were given Vitamin A supplementation or not.

Of 370 children, 248 (67%) children had illness, whereas 122 (33%) children did not suffer from any illness. Majority of the children had diarrhea (51.2%) followed by fever (29.1%) and cough and cold (15.3%) and 11 (4.4%) children suffered from pneumonia. Among these children who had diarrhea, 94 (74.01%) of children had 2 episodes, 17 (13.38%) 3–4 episodes, and 16 (12.59%) 1 episode of diarrhea per year. A total of 243 (65.7%) children received complete vaccination as per schedule, whereas 126 (34.1%) children were partially vaccinated. It is indicated that to 188 (55.62%) study subjects complete solid food was introduced after 1 year of age, followed by to 145 (42.89%) children complete solid food was introduced after 6 months of age, and to 4 (1.18%) children it was introduced before 6 months of age. Milk (88.4%) followed by vegetables (78.6%) was the most common food consumed by under-five tribal children. Among non-vegetarian food, egg was most consumed, whereas fish and meat were consumed by 2.2% and 1.9% of children, respectively. Only 3.5% of children received nutritional supplements.

Overall, the prevalence of underweight, stunting, and wasting was found to be 86.2%, 72.3%, and 58.6%, respectively. Severe underweight, stunting, and wasting were found in 18.9%, 26.2%, and 7.6%, respectively.

DISCUSSION

Despite rapid economic development along with increase in food production in recent decades and several nutritional intervention programs in operation since the last three decades, childhood undernutrition remains an important public health problem in India. It is one of the important reasons for mortality and ill health among the children.^[18] Overall, the prevalence of underweight, stunting, and wasting was 86.2%, 72.3%, and 58.6%, respectively, in the present study, and it was compared with the prevalence of underweight (71%), stunting (68%), and wasting (40%) observed in a study conducted by Jethy in preschool children in a tribal area of Kendujhar district, Orissa.

The prevalence of underweight, stunting, and wasting in our study was more than that of Jethy.^[19] Meshram *et al.* in their study found that overall prevalence of underweight was about 49%, of which 19% were severely underweight. The extent of overall stunting was about 51%, and of them, 24% were severely stunted. About 22% children had wasting, of which 7% had severe wasting. In the present study, severe underweight, stunting, and wasting were found 18.9%, 26.2%, and 7.6%, respectively, which is almost similar to the finding of Meshram *et al.*^[20] Meshram *et al.*^[21] in their study on undernutrition among tribal preschool children in Jabalpur district, Madhya Pradesh, reported that the prevalence of underweight, stunting, and wasting was 60.4%, 51.6%, and 43%, respectively. Rao *et al.* (2006)^[22] reported higher prevalence of underweight (72%) and stunting (67.8%), while the prevalence of wasting (13.4%) was lower among preschool children of the Saharia tribe of Rajasthan.

Persistent undernutrition is a major obstacle to human development and economic growth in India, especially among the rural poor and vulnerable areas, where the prevalence of malnutrition is the highest.^[23] Severe underweight was equal among the male and female under-five tribal children

Table 1: Gender wise distribution of underweight in children

Gender of child	Underweight				Total
	Normal	Mild	Moderate	Severe	
Male	20	46	69	35	170
Female	31	65	69	35	200
Total	51	111	138	70	370

Chi-square value=3.213, DF=3, $P > 0.005$ (not significant)

Table 2: Gender wise distribution of stunting in children

Gender of child	Stunted				Total
	Normal	Mild	Moderate	Severe	
Male	41	48	35	46	170
Female	60	39	50	51	200
Total	101	87	85	97	370

Chi-square value=5.011, DF=3, $P \geq 0.005$ (not significant)

Table 3: Gender wise distribution of wasting in children

Gender of child	Wasted				Total
	Normal	Mild	Moderate	Severe	
Male	66	55	31	18	170
Female	87	59	44	10	200
Total	153	114	75	28	370

Chi-square value=5.163, DF=3, $P \geq 0.005$ (not significant)

as shown in Table 1. As shown in Table 2, female children were found more likely to be stunted than male children. This may reflect the strong preference for son in India. According to NFHS-3 (2005–2006), overall, females and males were equally malnourished.^[24] It is evident from Table 3 that severe wasting was more in male under-five tribal children.

Strength and Limitations of the Study

Strength

Considering multiple contributing factors that affect child nutrition may help to use the limited resources more effectively and efficiently.

Limitations

There might be potential recall bias among respondents answering questions relating to events happening in the past.

It was difficult to entertain the seasonal variations. Data were collected during a particular rainy season, which was June, July, and August.

CONCLUSION

The present study demonstrates that children in Akole tribe are at high risk. Malnutrition continued to be a substantial burden in under-five children. Age, education, occupation, and religion of mothers, ANC checkup and IFA tablets during pregnancy, vaccination during pregnancy, number of children, and mother's addiction during pregnancy were significantly associated with malnutrition among under-five tribal children.

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