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Original Article

A study on the Prevalence of Under-nutrition among the Irular tribal adolescent girls in Thiruvallur District, Tamil Nadu, South India.

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ABSTRACT

Abstract: Adolescence is a period of transition from childhood to adulthood with various challenges to be overcome. Adolescence after the first year of life is the second critical period of rapid physical growth and changes in body composition, physiology and endocrine function¹. Achievement of optimum growth during this period is of utmost importance in maintaining good health thereafter. Under-nutrition among adolescents is a serious public health problem internationally, especially in developing countries². Adolescents form an important vulnerable, neglected sector of population, which constitutes about 21.4 percent of Indian population¹. Poor nutrition among the adolescents resulting in short stature and low lean body mass is associated with many concurrent and future adverse health problems³. Choudhary et al reported the prevalence of under-nutrition among the adolescent girls in rural area in India to be 46.6%⁴. There is paucity of data on under-nutrition among the tribal population in India, particularly in Tamil Nadu. Irular tribes are one among the six primitive tribes in Tamil Nadu who have settled in rural areas of the state⁵. This study aims to assess the nutritional status of adolescent girls belonging to the Irular tribes of Tamil Nadu. **Background:** Under-nutrition during the adolescence is an important public health problem in developing countries particularly in rural India. There is paucity of data on Under-nutrition among the Tribals wherein early detection prevents adverse health problems **Objective:** To assess the prevalence of under-nutrition among the Irular adolescent girls in Tamil Nadu. **Methods:** A community based Cross-sectional study was conducted among 200 Irular girls aged 10 to 19 years in Irularpalayam in Minjur block, Thiruvallur District of Tamil Nadu using the Multi-stage sampling method during March to July 2013. Socio-demographic data, anthropometric measurements, Hemoglobin estimation were recorded and Thinness was defined as BMI < 5th centile (CDC 2000). Anemia was defined as Hb < 12 gm% for non-pregnant girls **Results:** The prevalence of Thinness was 63.5% with increasing severity with advancing age with statistical significance. Prevalence of Anemia was 58% with increasing severity with age. Majority of 70% had clinical signs of Under-nutrition. Access to Health services was observed to be very low in this community. **Conclusion:** Under-nutrition in the form of Thinness and Anemia is highly prevalent among the Irular adolescent girls requiring special focus on Health education, nutritional interventions for a healthy productive life.

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1. Introduction

Adolescence is a period of transition from childhood to adulthood with various challenges to be overcome. Adolescence after the first year of life is the second critical period of rapid physical growth and changes in body composition, physiology and endocrine function¹. Achievement of optimum growth during this

period is of utmost importance in maintaining good health thereafter. Under-nutrition among adolescents is a serious public health problem internationally, especially in developing countries². Adolescents form an important vulnerable, neglected sector of population, which constitutes about 21.4 percent of Indian population¹. Poor nutrition among the adolescents resulting in short stature and low lean body mass is associated with many concurrent and future adverse health problems³. Choudhary et al reported the prevalence of under-nutrition among the adolescent girls in rural area in India to be 46.6%⁴. There is

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paucity of data on under-nutrition among the tribal population in India, particularly in Tamil Nadu. Irular tribes are one among the six primitive tribes in Tamil Nadu who have settled in rural areas of the state⁵. This study aims to assess the nutritional status of adolescent girls belonging to the Irular tribes of Tamil Nadu.

2. Materials and Methods:

A community based cross-sectional study was designed to assess the prevalence of Under-nutrition in the form of Thinness and Anemia among the Irular tribal adolescent girls in Irularpalayam tribal village in Minjur Block of Thiruvallur District in Tamil Nadu, chosen by Multistage sampling method during March to July 2013. There is no data on the nutritional status of Irular tribal adolescent girls and that these tribes have settled predominantly in rural and hilly area. NNMB 2003, report 20 reported the prevalence of Under-nutrition among the rural adolescent girls to be 53.3%⁶. With alpha at 5, precision of 15%, the sample size was calculated to be 200. Irular adolescent girls of age 10 to 19 years who were recruited from the adolescent register maintained at ICDS centre in the chosen Irular tribal village. All the adolescent girls in the tribal village were included in this study until the desired sample was achieved. Eligible participants belonging to the adolescent age were included. 12 adolescent girls who were pregnant during the study were excluded. Details of socio-demographic data, anthropometric measurements of weight using bathroom weighing scale and height using non-elastic measuring tape were obtained from the subjects after the informed consent. Clinical examination for the signs of Nutritional signs was done among the subjects. For estimation of Hemoglobin, after consent, 10 mcl of capillary blood was drawn in Hemoglobin micropipette and transferred to respective tube with identity number containing 2.5ml of Drabkin's reagent. Hemoglobin estimation was done by Cyanmethemoglobin method using photoelectric Calorimeter with wavelength 520nm (green filter). Anemia was defined as Hb < 12 gm% for non-pregnant girls⁶. The Body Mass Index for age was used to classify the nutritional status with CDC 2000 reference. Under-nutrition was defined as Body Mass Index < 5th centile and severity was graded as per WHO classification. Data was entered and Statistical analysis was done with SPSS. Health Education, Nutritional advice, referral of Under-nourished and anemic girls to the Health facility was carried out after the study

3. Results:

Out of 200 adolescent girls, 54 were early adolescent (10 to 13 years of age), 61 were mid adolescent age (14-16 yrs) and 85 belonged to late adolescents (17-19years of age). Only 43% of the tribal girls were literate, of whom no one continued to attend school beyond the High school education and all belonged to lower socio-economic status as per Modified BG Prasad classification. 78% of adolescent girls were menstruating and 33% of the adolescent girls were married below the age of 18 years. The overall prevalence of under-nutrition with Body Mass Index < 5th centile among the adolescent girls was 63.5%. No one was over-weight and the rest 73 girls were in normal range of BMI. The mean body Mass Index

among the three adolescent age groups showed increasing under-nutrition with increase in age which was statistically significant ($p < 0.001$) Table 1. Severity of thinness was higher among the late adolescents belonging to the age 17 to 19 years. About 70% of the girls showed the signs of clinical pallor and Angular stomatitis, 12% had Bitot spots, 61% had Dental caries, 5% had goiter. Out of 200 adolescent girls, 116 girls (58%) were anemic. Of which 49 (42.2%) had mild anemia (Hb 10.9-12gm%), 57 (49.1%) girls had moderate anemia (Hb 10.9- 8 gm%) while 10 (8.7%) girls had severe anemia (Hb < 8 gm%). The prevalence of anemia was 67.3% in Postmenarchal girls when compared to premenarchal girls (25.7%). Severity of anemia also increased with increase in age among the adolescent girls which was statistically significant ($p < 0.01$) Table2. Only 38% of the adolescent girls had utilized the nutritional supplements and Iron supplements supplied in the nearby ICDS centre in the Tribal village.

Table1: Severity of Thinness based on BMI of Irular adolescent girls

Body Mass Index BMI (n= 200)	Early adolescence (10-13 years age)	Mid adolescence (14-16 years)	Late adolescence (17-19years)
Overall Thinness (BMI < 18.5) = 127	20	41	66
Mild Thinness (BMI 17 - 18.4)	6	11	13
Moderate Thinness (BMI 16 -16.99)	8	10	16
Severe Thinness (BMI < 16)	6	20	37

P = 0.0002

Table 2: Severity of Anemia among the adolescent girls (n= 116)

Grading of Anemia (Hb < 12 gm%)	Early adolescence (10-13 years age)	Mid adolescence (14-16 years)	Late adolescence (17-19years)
Mild (10.9-12 gm%) (n= 49)	13	16	20
Moderate (8-10.9%) (n=57)	12	19	26
Severe (Hb < 8 gm%) (n=10)	1	2	7

P = 0.02

4. Discussion:

Adolescence is the crucial period of transition between childhood and adulthood wherein the nutritional requirements if not met during this vulnerable period, results in under-nutrition

and ill-health. This in turn reflects on the future maternal and child nutrition. Deshmukh P R et al⁷ reported the prevalence of Thinness with BMI < 18.5 among the adolescents in the rural area in Wardha to be 53.8%. Thus the adolescence is a period of challenge in terms of achieving health and adequate nutrition particularly among the girls. In this study, the prevalence of under-nutrition among the Irular tribal adolescent girls was 63.5% in the state of Tamil Nadu. The everity of under-nutrition increased with increase in age reflecting the unmet nutritional needs of this tribal population. As age advances in the period of adolescence, there is an increase in demand probably due to menstruation and rapid growth which renders them to be severely under-nourished. Majority of the tribal girls had clinical pallor and other signs of Nutritional deficiency. Choudhary S et al reported that two-thirds of their subjects had Under-nutrition and the prevalence of anemia among the rural adolescent girls in Varanasi to be 25.9%⁴. In our study majority 58% of adolescent girls were anemic with increasing severity as age advanced.

In this study, there is high prevalence of illiteracy and ignorance about the facilities available in local Health services focusing on nutrition and health. Irular tribes are one among the primitive tribes in Tamil Nadu who mainly survive on forest products, daily labour and agricultural labour etc. Various Public health problems like Illiteracy, higher order births, poverty, malnutrition, increased maternal and infant mortality are prevalent among the Irular tribes in Tamil Nadu^{8,9}. The Irular tribes are unaware of the benefits available in the local health services for the betterment of their nutrition and health. Improvement in the dietary pattern, intra-family food distribution, improving the economic status, Health education regarding the nutritional intake are to be focused to alleviate this problem of under-nutrition among the tribal population as recommended by K Srinivasan et al¹⁰.

5. Conclusion and recommendation

The overall prevalence of Under-nutrition in the form of Thinness among the tribal adolescent girls was 63.5% and anemia was 58%. A statistical significance was observed with severity of the under-nutrition with advancement in age which reflects the mismatch of nutrients for healthy growth. There is an emphasis on the Health education, treatment of infections, supplementation of Vitamins, Iron and Folate tablets, creating awareness on sound eating habits which is to be focused by the local health authorities to alleviate this public health problem prevailing among the tribal population to achieve good maternal and child health which in turn reduces maternal and infant mortality.

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Contributions from the authors;

Author 1 : Design, conduct of the study, write up of article

Author 2: conduct of study and Analysis

Author 3: Analysis and guidance in write up

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