

# Nutritional health of adolescents of Arunthathiyar population and factors associated

<sup>1</sup>Ms. Jahnvi Devi, <sup>2</sup>Dr. K. Arockia Maraichelvi

<sup>1</sup>Ph. D, Research Scholar, Department of Human Development, Faculty of Home Science, Avinashilingam Institute for Home Science and Higher Education for women, Coimbatore-641043, TamilNadu, India.

<sup>2</sup>Associate Professor & Head, Department of Human Development, Faculty of Home Science, Avinashilingam Institute for Home Science and Higher Education for women, Coimbatore-641043, Tamil Nadu, India.

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**Abstract:** The Arunthathiyars are densely populated in the western districts of Tamil Nadu. They are the most discriminated not only by the general public but even among the dalit community. In the urban area the community is mainly involved in conservancy work, and in the rural area majority of them are agricultural laborers. Considering their economic status and the kind of facilities provided in the government schools like the uniforms, books, midday meals and also free education, majority (83%) of the adolescents were enrolled in those schools. A detailed survey was conducted in the selected taluk of Coimbatore district and data was collected from 494 adolescents in the age group 11 – 19 years from six villages using a questionnaire. BMI (Body mass Index) was calculated with height and weight measurements to appraise the nutritional status of the selected sample. The statistical analysis found that 48 per cent were undernourished with BMI being significantly influenced by the type of school and not with age and gender.

**Keywords:** Arunthathiyars, discrimination, adolescents, BMI (Body Mass Index), nutritional health.

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## 1. INTRODUCTION

Arunthathiyars is a caste within the list of 76 scheduled castes notified by the President of India under Article 341 of the constitution of India, and (Scheduled Castes) Order, 1950 as amended from time to time. Based on Hindu caste system, Dalits are placed at the bottom of the caste hierarchy in the Indian society. Dalits are further categorized into sub castes in Tamil Nadu as Pallar, Parayan and Arunthathiyar. Among Dalits Arunthathiyar are placed at the lowest status (Athyamaan, 2009).

With psychological, social and political barriers playing a major role affecting the development of Arunthathiyars, they do not seem to be equipped with qualities, dispositions, skills, motivations and values linked to upward mobility when compared with the more privileged. Social activists have observed intergenerational maintenance of social positions; the adults attitude of withdrawal and indifference to change seems to be passed on to the younger generation. In all societies, adolescence is about growing up, about moving from the immaturity of childhood into the maturity of adulthood, of preparation for the future (Steinberg, 2008)

The adolescents are worthy of care and protection as young children, and as worthy of consideration and participation as adults. It is for the world to recognize both what it owes to them and the singular dividends that investing in this age of opportunity can generate for the adolescents themselves and for the societies in which they live (UNICEF, 2011). Good nutrition and dietary behaviour are important during adolescence to achieve full growth potential and appropriate body composition, to promote health and well-being, and to reduce the risk of chronic diseases in adulthood (Ramya and Thomas, 2015)

Adolescents account for one fifth of the world's population and have been on an increasing trend. In India they form 21 percent of the population (Planning Commission's Population Projections, Census of India 2011). This implies that about 253 million Indians are adolescents (133 million male, 119 million female). Out of which 44 million (23 million male, 21 million female) are from Dalit community.

The World Food Programme and M. S. Swaminathan Research foundation (MSSRF), found that children in rural India have inadequate calorie intake and chronic energy deficiency levels remains steady. Under nutrition not only affects physical appearance and energy levels but also directly affects many aspects of the children's mental functions which have adverse effects on their ability to learn and process information, and grow into productive citizens and contribute to their society. Under nourishment also impairs immune functions leaving them more susceptible to infections. Children with infections are more susceptible to malnutrition and the cycle of poverty and malnutrition continues (Prasad, 2011)

Body Mass Index (BMI) was considered as an important nutritional index for detecting cases of underweight and overweight of individuals (WHO, 1995). Currently BMI is the preferred weight for height standard; because it was considered as the clinical measurement most closely related to body fat content and was being calculated as

$BMI = \frac{\text{Body weight (in kilograms)}}{\text{Height}^2 \text{ (meters)}}$

Height<sup>2</sup> (meters)

The concept of BMI was convenient to use because the values apply to both male and female (i.e gender neutral). BMI was used as a screening test for overweight or obesity (Wardlaw and Smith, 2015). Since nutrition is vital and important indicator of health and BMI is an important nutritional index, the study was focussed towards assessing the state of nutritional health of adolescents with BMI.

#### ***Rationale of the study:***

Arunthathiyars are the most marginalized group among the dalit community, in spite of existing laws the atrocities against them persists. There were quite a number of studies carried out on Arunthathiyar community as a whole, but the studies on adolescents are either non-existent or meagre. The present study would open up a new chapter in the literature related to Arunthathiyars. This study is of interest to the researcher mainly due to the fact that there is limited or no literature available on Arunthathiyars, particularly of the adolescents (11– 19 years). Celeti, (2015) quotes professor of Loyola college "The Arunthathiyar caste is low and that they have not been studied"

#### ***Objectives:***

The objectives of this study were

1. To assess the personal and socio-economic background
2. To assess the nutritional health status of adolescents of Arunthathiyar community
3. To explore the influence of age and gender on the nutritional status of adolescents
4. Characterize the type of school on nutritional health status of adolescents

## **2. METHODOLOGY**

With exploratory research design as the framework, multistage sampling method was chosen as the population of Arunthathiyars is spread out all over Tamil Nadu. The process involved in the selection of sample went through seven stages. The journey of selection of sample began with selection of four out of 32 districts in Tamil Nadu in the first stage, and concluded by selecting 494 adolescents in the age group 11 – 19 years from six villages in the selected taluk, in the sixth stage.

The detailed survey was conducted in the selected taluk, and data was collected from 494 adolescents using a questionnaire. As part of assessment of nutritional status, BMI (Body mass Index) was calculated with height and weight measurements. The percentages and chi square test were the main statistical tools applied and it was found that 48 per cent were undernourished, age and gender with BMI was insignificant, and however type of school and BMI were significant.

### 3. RESULTS AND DISCUSSION

The data was analysed statistically and discussed under the following heads

#### 3.1 Personal and socio – economic background of adolescents

The Table 1 details personal and socio – economic background of adolescents

**TABLE 1: PERSONAL AND SOCIO – ECONOMIC BACKGROUND OF ADOLESCENTS**

Variables	N	%	Variables	N	%
<b>Gender</b>			<b>Type of Family</b>		
Male	242	49.0	Nuclear	410	83.0
Female	252	51.0	Joint	84	17.0
Total	494	100.0	Total	494	100.0
<b>Age in Years</b>			<b>Family size (Numbers)</b>		
11 -13	134	27.1	02	01	0.2
			03	41	8.3
14- 16	173	35.0	04	85	57.7
17-19	187	37.9	05	105	21.3
Total	494	100.0	06	47	9.5
<b>Class</b>			07	15	3.0
Middle	129	26.1	Total	94	100.0
High School	150	30.4	<b>Family income</b>		
Cert. Course	05	1.0	1001 – 3000	13	2.6
Hg.Secondary	144	29.1	3001 – 5000	59	11.9
Diploma	10	2.0	5001 – 8000	179	36.2
Degree	56	11.4	8001 – 10,000	128	25.9
Total	494	100.0	10,001 – 15,000	70	14.2
<b>Type of Institution</b>			15,000 >	45	9.2
Government	430	87.0	Total	494	100
Private	64	13.0			
Total	494	100			

The details in the table reveal that there was not much of gender disparity; in fact, it was quite interesting to note the girl's participation was two per cent more than the boys. In India, provision of midday meals or free clothes was found to substantially improve enrolment rates for girls in rural areas (Mehrotra, 2006; Dreze and Kingdon, 2001). The average age of majority (35%) of the respondents was 14–16 years (median calculated), and 17–19 years was the next major percentage (37.9%) age group.

From these two age groups, 30 per cent of the respondents were in high school, 11 per cent into graduation and 29 per cent continued their studies in the higher secondary. A majority (87%) of the respondents were enrolled in government schools, while the rest 13 per cent of them got into private institutions. Given the kind of facilities in government schools, and parent's financial constraints, it was but obvious that they preferred those schools. It was also found that a lavish playground and the gardens maintained in the schools were some of the positive aspects that developed the student's affinity to schools

The percentage of nuclear families was seen to be high as 83 per cent; this could be mainly due to space availability. The average family size was four. The family income of the majority of the families was found to be in the range of ₹. 5000 – 8,000/-.

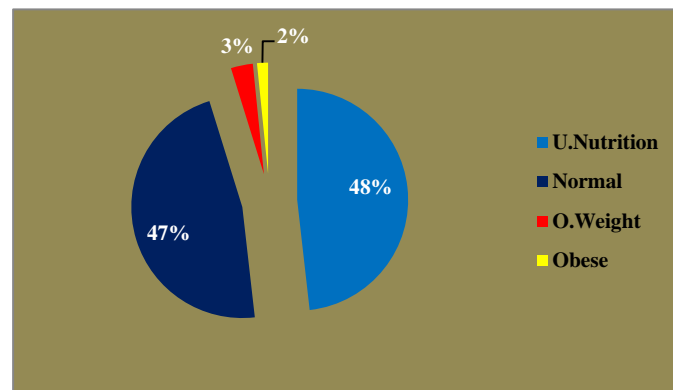
### 3.2 Nutritional health status of adolescents

The Table - 2 and Figure -1 categorizes the identified adolescents into their different levels of nutritional status - as under nutrition, normal, overweight and obesity by means of BMI.

**TABLE 2: BMI OF SELECTED ADOLESCENTS**

BMI	N	%
Under nutrition	238	48.2
Normal	232	47.0
Overweight	16	3.2
Obesity	08	1.6
<b>Total</b>	<b>494</b>	<b>100</b>

The above table details the state of nutritional health of adolescents, nearly 50 per cent of them were under nourished and almost an equal percentage of them were normal. The percentage of overweight and obese was negligible. Exploring the connection between overweight and socio - economic status (SES), a study by Goyal, Shah and Saboo, (2010) found the prevalence of obesity and overweight in adolescents in the lower socio-economic groups was the least as compared to middle and higher socio-economic groups, and this holds true with the finding of the present study. However the high percentage of adolescents, who were in the category of under nutrition, draws our attention. Significant to the present study, research carried out by National Nutrition Monitoring Bureau (2003) in the rural population revealed that the prevalence of under nutrition among adolescents as assessed by weight for age was about 40 – 50 per cent (Srilakshmi, 2014). The Figure – 1 gives a glimpse of BMI of adolescents.



**FIGURE 1: BMI OF SELECTED ADOLESCENTS**

The ICDS (Integrated Child Development Services) programme that caters to the services of preschool children and expectant and nursing mothers must frequently educate the mothers as well as the adolescents on the importance of role of nutrition in the growth and development.

### 3.3 Age and BMI

The Table –3 and Figure -2 captures the age of adolescents and the BMI, the test values were thus presented.

**TABLE 3: AGE AND BMI**

Gender	BMI									
	Under nutrition		Normal		Over weight		Obese		Total	
	N	%	N	%	N	%	N	%	N	%
<b>Age</b>										
11	15	3.0	13	2.6	1	0.2	2	0.4	31	6.3
12-13	35	7.1	62	12.6	5	1.0	1	0.2	103	20.9

14-16	90	18.2	76	15.4	4	0.8	3	0.6	173	35.0
17-19	98	19.8	81	16.4	6	1.2	2	0.4	187	37.9
Total	238	48.2	232	47.0	16	3.2	8	1.6	494	100
<b>Df- 9</b>			<b>Chi square value - 16.799</b>				<b>P value – 0.052<sup>NS</sup></b>			

The chi square analysis with age and BMI was not significant. The percentages of adolescents in each age group were almost 50 per cent who were undernourished; therefore age was not a significant factor. According to Srilakshmi, (2014) a very large population of rural Indian households who have inadequate food supplies and chronic energy deficiency was due to chronic food deficiency. While it is important to be sensitive to the additional nutrient requirements of the adolescence growth period, families were either ignorant or unable to meet the requirements. The meal cooked was shared by all the family members, and therefore the additional food requirements of the adolescents may tend to be overlooked. People whose BMI is less than 18.5 are considered as underweight. The Figure - 2 portrays the age variations and BMI

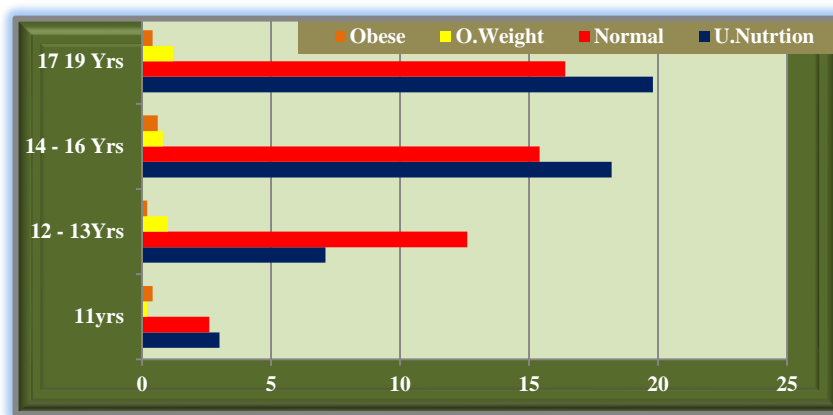


FIGURE 2: AGE AND BMI

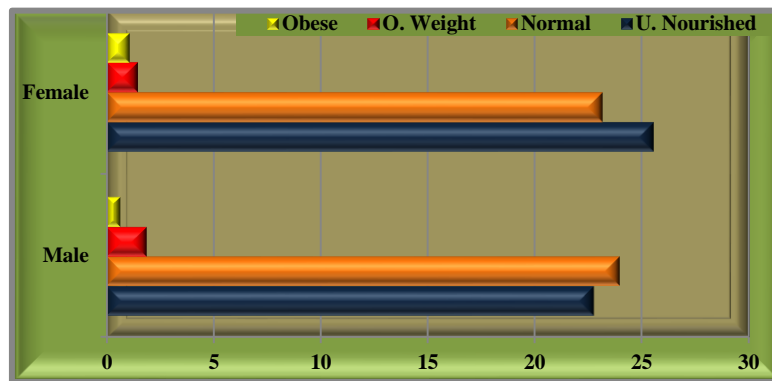
### 3.4 Gender and BMI

The Table – 4 and Figure – 3 details gender and BMI of adolescents as follows

TABLE 4: GENDER AND BMI

Gender	BMI									
	Under nutrition		Normal		Over weight		Obese		Total	
	N	%	N	%	N	%	N	%	N	%
<b>Gender</b>										
Male	112	22.7	118	23.9	9	1.8	3	0.6	242	49
Female	126	25.5	114	23.1	7	1.4	5	1.0	252	51
Total	238	48.2	232	47.0	16	3.2	8	1.6	494	100
<b>Df – 3</b>				<b>Chi square value-1.441</b>				<b>p value – 696<sup>NS</sup></b>		

The p -value in the table - 4 indicates that the gender and BMI were not significant. The percentages of male and female adolescents were more or less equally spread out at all levels of BMI, thus signifying that gender had no bearing with BMI. Though the percentages of overweight and obese adolescents were very low, almost 50 per cent of male and female adolescents were under nourished. Chitra and Reddy, (2007) studied the dietary pattern of 10–15 year olds and demonstrated that only 42.8 per cent of the adolescents ate breakfast regularly and the mean nutrient intakes were inadequate compared with the recommended values for energy and protein. The inadequate energy intake was reflected in a high incidence of malnutrition in both boys and girls; 40.3 per cent of the boys and 32.1 per cent of the girls studied were found to be underweight. The Figure - 3 highlights the gender variations in BMI.



**FIGURE 3: GENDER AND BMI**

Upon discussion, it was evident that many adolescents in the villages have left over rice from the previous day, or some variety rice for breakfast and this lacks the required nutrient intake.

### 3.5 Type of school and BMI

The Table – 5 presents the type of school and BMI of the selected adolescents.

**TABLE 5: TYPE OF SCHOOL AND BMI**

Type of school	BMI										
	Under nutrition		Normal		Over weight		Obese		Total		
	N	%	N	%	N	%	N	%	N	%	
<b>Type of school</b>											
Government	201	40.7	211	42.7	11	2.2	7	1.4	430	87.0	
Private	37	7.5	21	4.3	5	1.0	1	0.2	64	13.0	
Total	238	48.2	232	47.0	16	3.2	8	1.6	494	100.0	
	<b>Df – 3</b>			<b>Chi square value - 9.302</b>				<b>P value 0.026<sup>s</sup></b>			

The type of school and BMI was found to be significant at five per cent level. A majority of the adolescents (43%) from government schools were at the normal level of nutritional health as compared to adolescents from private schools where eight out of thirteen per cent were under nourished. The reason for lesser percentage of undernourished adolescents, however, may be the midday meal programme in government schools. The meals provided were based on a combination of cereals, pulses, and leafy vegetables, eggs were given thrice a week, The diet helped in increase the amount of vitamins and minerals, weight gain and also addressed the deficiency symptoms (Srilakshmi, 2014).

The food and nutrition component being a vital factor, and relatively most families particularly the poor and marginalised were either ignorant or negligent, it could be suggested that the school curriculum (both in government and private) must have a combination of theory and practical classes on nutrition, right from the middle school onwards, where they would be able to grasp its importance. The frame work could be based on basic knowledge on making a home / school garden to grow the common vegetables, nutrition and skills in food preparation.

## 4. CONCLUSION

The study related to adolescents would be useful to understand the general and nutritional status of adolescents of Arunthathiyar population, as there were not many studies carried out on Arunthathiyars. The community for generations are involved in the menial jobs with low income, and therefore their development was observed to be at a snail pace in all the districts visited by the researcher. The study related to nutritional health assessment of adolescents of Arunthathiyar population has revealed that 48 percent were undernourished; age and gender variations were not significant. It was clear that the adolescents in government school were better in their nutritional health status as compared to those in the private school. The supplementary nutrition programme in the government schools was thus seen to be the supportive factor.

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