

## Role of Preliminary Data Collection for Nutritional Education of Adolescent (13-15 yrs) in Two Different Regions of South India

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### Abstract

The study aims at ascertaining the most appropriate communication media to be used to bringing about preliminary data for nutrition education in children for sustainable development. The present investigation was undertaken with the major objective focusing on "Assessment of Nutritional Status and impact of nutrition education among Adolescents (13-15 Yrs) of Vijayawada in Andhra Pradesh and Chennai in Tamil nadu". Total number of subjects from different schools of the two places was 600. Among 600, 300 subjects (both girls & boys) belong to Vijayawada and 300 subjects (both girls & boys) from Chennai. After the selection and briefing the results were constructed based on study protocol, which was constituted based on major areas like - Prevalence of malnutrition, Socio demographic status of the subjects, family type, religion, academic performance, family members education, their occupation and monthly income, finally adolescents socioeconomic status. It was observed in the present study that a large proportion (81.25% in girls and 87.50% in boys) of Vijayawada and (72.41% in girls and 40.47% in boys) of Chennai adolescents under study was normal. This may be due to socio-economic status (SES) of their parents. Which if continued in future, can have long lasting effect on improvement of nutritional status and healthy lifestyle.

**Keywords :** Nutrition Education, Nutritional Status, Prevalence of malnutrition, Socio demographic status, Academic performance

### Introduction

Health is more important for all human beings. Sincere care is needed to give perfect health to children because they constitute the most precious resource for a country. The focus should be to improve the quality of life by giving the needed importance to the children to promote their health and protect them from diseases. Presently, we should provide legal protection and create health, education and social welfare services for the adolescent population. Adolescents are not a homogeneous group their situations and needs vary by age, sex, socio-cultural context, including marital status, level of educational attainment, employment status, rural-urban residence, migration status, sexual activity, living arrangements, religion and household economic status (1).

After facing plethora of achievements, adolescents continue to be at a disadvantage and face barriers that restrict their access to resources, inhibit their ability to make choices about their life and limit access to education, employment opportunities and reproductive health care services. During adolescent period hormonal changes regulate the development of sex characteristics. In girls there is an increase in subcutaneous fat around abdominal area and increased bone development around pelvic region. The growth in boys is slow but they beat girls in height and weight since they put on more muscle mass and there is growth in long bones.

Many scientists like (2, 3) conducted a study on large group of school going adolescents. Still there is need to create awareness to improve the nutritional needs of adolescents in rural areas (4). Previous research studies provide evidence of an association between diet, physical activity, ethnicity, nutritional status of adolescent school going children, food intake, and the family's socioeconomic level, among others, and occurrence of under nutrition and overweight of the adolescents.

Nutrition Education is an essential component to improve the nutritional status of a population and is crucial for the wellbeing of the people in general. In the light of the rapid socio-economic changes that have taken place in the country in the past decade or so, it was deemed timely to undertake another comprehensive assessment of the nutritional status. A sympathetic approach towards adolescents (13 to 15 years) motivated the current study to be undertaken to understand and compare the dietary pattern and prevalence of malnutrition among adolescents in two cities in two states. The research investigation in these specific locations was carried out and many factors are taken into consideration like prevalence of malnutrition, family type, religion, academic performance, family member's education, their occupation, their income and finally socioeconomic status.

### **Materials and Methods**

Majority of the adolescents in India consume inadequate diet and usually skip meals due to various reasons which reduce the appetite leading to malnutrition and obesity among adolescent. Pubertal growth demands more body building substances and BMR is increased which demands more energy. The aim of the study was to focus on the nutritional status of adolescents belonging to two different regions, existing in different socio-cultural and environmental conditions. The study also intends to examine the difference between the impact of nutritional education awareness on food habits and academic performance with emotional maturity.

**Selection of study area and sample :** The current study was conducted in schools of Vijayawada in AP and Chennai in TN of India from 2015-2017. The list of private corporate and Government secondary schools in the local government was collected from the two different cities of State Ministry of Education. From adolescents of age group of 13-15 years who were there at school during the period of study. Convenient sampling technique was used to choose the sample size. A total of 1080 children between age group of 13-15 years were taken, out of which 553 were from Vijayawada and 527 from Chennai. Further, sub divided among boys and girls categorized as overweight, underweight and Normal. Samples were selected from schools as it was easy to take the follow-up with children for pre and post nutrition education. The persistence of the study was educated and approval was obtained from the Head of the Institution. Parents were also refined of the school nutritional status survey by the school authorities. A predesigned and pretested questionnaire was used to collect data concerning demographic characteristics and any current health complications or in the current past by one to one interview method.

**Selection of variables and Tools for collection of data :** In the present context, the adolescents were categorized for further study of nutritional status by using anthropometric measurements, biochemical and clinical assessment. Relevant schedules were prepared and the data was collected through personal interviews. A general information survey schedule was administered (section I).

### **Results and Discussion**

The present investigation was undertaken with the major objective focusing on "Assessment of Nutritional Status and impact of nutrition education among Adolescents (13-15 Yrs) of Vijayawada in Andhra Pradesh and Chennai in Tamilnadu". Total number of subjects from different schools of the two places was 600. Among 600, 300 subjects (both girls & boys) belong to Vijayawada and 300

subjects (both girls & boys) from Chennai. After the selection and briefing the results were constructed based on study protocol, which was constituted based on major areas like - Prevalence of malnutrition, Socio demographic status of the subjects, family type, religion, academic performance, family members education, their occupation and monthly income, finally adolescents socioeconomic status.

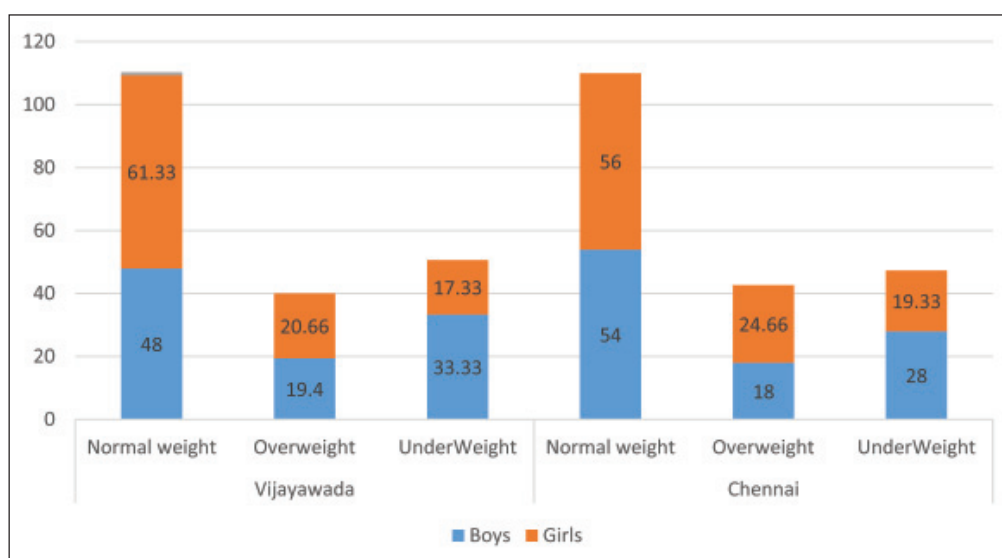
**Prevalence of malnutrition :** Subjects of specific age group (13-15 Yrs.) were selected from private schools of two places. Further, the subjects were categorized malnutrition wise distribution was done based on BMI calculated and BMI percentile for age by CDC government standards.

Table 1 and Fig 1 depicts the prevalence of malnutrition among adolescents in both the cities. In Vijayawada, 54.67% children belong to normal category among which girls outnumbered than the boys. Only 20 % Vijayawada children were overweight, where again more girls were overweight than boys. However, it was observed that 25.33% Vijayawada children were underweight and opposite trend of more underweight boys than girls

were noted (37.33% v/s 21.33%). Similar pattern was observed in case of Chennai children where 53.83% belonged to normal weight, 21.33% overweight and 23.66% were underweight. More percentage of girls in this city too was normal weight and overweight while more % of boys were underweight than girls. Thus, it can be noted that 54.83% of children from these two cities were normal weight followed by underweight which (24.16%) and only 19.83% were obese. Percentage of underweight boys in both the cities was higher than girls.

**Socio demographic status of the subjects :** The aim behind intriguing the socio demographic status of subjects was to collect the details about their family background as it influences their lifestyle. It was important to know the general information before going further as it was going to help while analyzing and relating their answers and also helped to get familiar with the subjects.

**Type of family :** Table 2 shows the type of family of adolescents. In this study, it was observed that among all categories majority belonged to the nuclear type of family followed by joint and then



**Fig: 1.** Percentage of prevalence of malnutrition among adolescents

extended. In Vijayawada majority of underweight boys (51.78%) were living in a joint family and overweight boys (56.00%) were living in a nuclear type family. Out of 150 boys only (8.66%) were living in extended family type whereas (50%) belonged to the nuclear family. None of the overweight children in belonged to extended families.

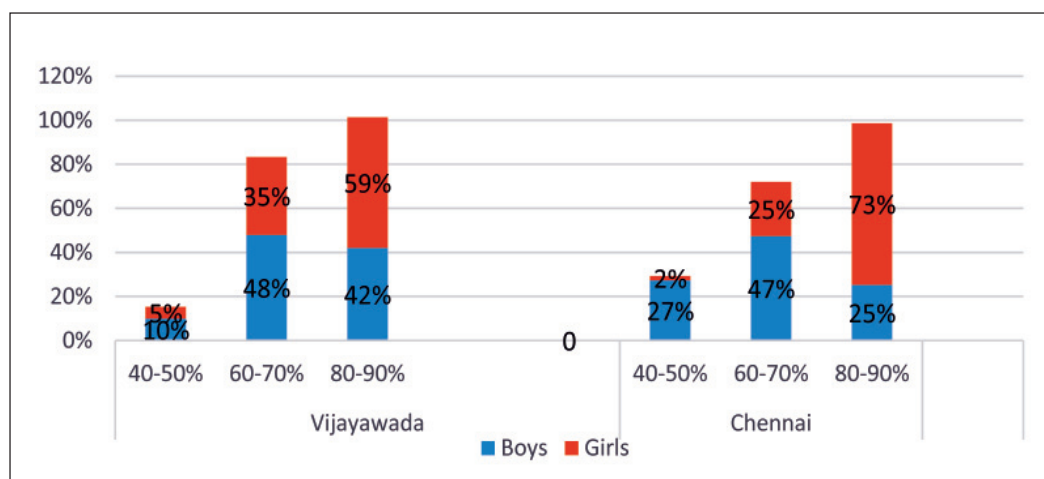
**Religion :** Religion-wise distribution of adolescents is categorized and shown in Table 3 as Hindu, Muslim, Sikh and Christian. The results revealed that majority of respondents families i.e. 99.66% from Vijayawada and 81% from Chennai were Hindus and 0.33% and 11.66% were Muslims respectively. Only 1.16% of Sikh and 2.5% of Christian were from Chennai whereas no subject from Vijayawada belonged to Sikh or Christian category.

**Academic performance :** The Table 4 and Fig 2 brief the percentage of marks obtained by adolescents in the last exam of their academic year. From Vijayawada city majority of boys (48.00%) scored 60-70% marks whereas (59.33%) of girls scored 80-90%. 42.00% boys scored 80-90% marks out of which normal weight category was a case of girls also it was observed that a

number of girls scoring 80-90% was highest among normal weight category. Only 10% and 5.33% of boys and girls scored 40-50% marks respectively. Maximum girls from both the cities scored the highest percentage of marks compared to boys. Maximum boys from Vijayawada in all the three categories of weight scored the highest percentage of marks as compared to Chennai boys. An opposite of this trend maximum Chennai girls belong to all categories of weight scored the highest percentage of marks compared to Vijayawada girls.

From Chennai, majority of boys (47.33%) scored 60-70% marks, 27.33% scored 40-50% and 25.33% received 80-90%. Among girls (73.33%) scored 80-90% 24.66% scored 60-70% and rest 2% under 40-50% having underweight and overweight categories none of the normal weight girls scored 40-50% marks in academic performance.

**Education of family member's- education of mother (Female) :** Table 5 depicts education of mother of adolescents in both Vijayawada and Chennai. In Vijayawada the maximum percentage 67.33% and 68.00% of boys and girls mother were graduates and above. 28% of boys and 26% of



**Fig: 2.** Gender and weight wise distribution of adolescents on academic performance

girls mothers were twelveth passed. Only 4.66% and 5.33% of boys and girls mother were tenth and below educated.

In Chennai percentage of boys and girls mothers education was more in graduate and

above category (39.33%) and (76.66%) respectively. From the results, we can observe that 42.85% of underweight boy's mothers were tenth and below educated. Among underweight girls none of the respondent's mother were tenth class and below educated. 34% and 18.66% of boys and

**Table. 1.** Percentage of prevalence of malnutrition among adolescents

S. No	Gender	Weight wise distribution			Total
		VN	Vijayawada VO	VU	
1	Boys	72 (48.00)	29 (19.40)	50 (33.33)	150
2	Girls	92 (61.33)	31 (20.66)	26(17.33)	150
	Total	164 (54.67)	60 (20)	76 (25 .33)	300
		CN	Chennai CO	CU	
1	Boys	81 (54.00)	27(18.00)	42 (28.00)	150
2	Girls	84 (56)	37 (24.66)	29(19.33)	150
	Total	165 (55)	64 (21.33)	71 (23.66)	300
	Grand Total	329 (54.83)	124 (19.83)	145 (24.16)	600

Figures in parenthesis indicate percentages

**Table: 2** Type of family of adolescents in Vijayawada and Chennai

Gender	Type	N		O		U	
	offamily	Vijayawada	Chennai	Vijayawada	Chennai	Vijayawada	Chennai
Boys	Nuclear	39(56.52)	58 (71.60)	14(56.00)	17 (62.96)	22 (39.28)	23 (54.76)
	Joint	22(31.88)	20 (24.69)	11(44.00)	9 (33.33)	29(51.78)	15 (35,71)
	Extended	8(11.59)	3(3.70)	0(0.00)	1(3.70)	7(8.92)	4(9.52)
	Total	69(46.00)	81(54.00)	2(16.66)	27 (18.00)	36 (37.33)	42 (28.00)
Girls	Nuclear	47(52.80)	62(73.80)	21(72.41)	22 (59.45)	20 (62.5)	21(72.41)
	Joint	34 (38.20)	15 (17.85)	8(27.58)	11 (29.72)	10 (31.25)	5(17.24)
	Extended	8(5.98)	7(8.33)	0(0.00)	4 (10.81)	2(6.25)	3(10.34)
	Total	89 (39.33)	84(56,00)	29 (19.33)	37 (24.66)	32(21.33)	29 (19.33)

Figures in parenthesis indicate percentages



girls mothers were a twelveth pass. 26.66% of boys mothers were tenth and below in girls, the percentage was very less up to (4.66%).

**Education of father (Male) :** Education of father of adolescents in both Vijayawada and Chennai are shown in table 5. In Vijayawada maximum percentage, 73.33% and 4.66% of boys and girls father were graduates and above. 24% of boys and 12.66% of girl's father were twelveth pass. Only 2.66% of boys and girls father were tenth and below educated. None of the underweight girl's father were tenth and below educated.

In Chennai the percentage of boys and girls father education was more in graduation and above category (42.00%) and (80.00%) respectively. From the table, we can observe that 42.85% of underweight boys fathers were tenth and below educated whereas, among underweight girls none of the respondent's fathers were tenth and below. 12.66% and 14.66% of boys and girls fathers were twelfth pass, 23.33% of boy's father was tenth and below in girls, the percentage was very less up to (5.33%). The percentage of father education up to graduation and above always superseded the percentage of mothers in both the cities respective of the weight of the children. Except for boys belonged to Chennai underweight where maximum

percentage of parents was educated up to X and below, a higher percentage of parents were more educated in rest of the categories.

**Occupation of the family :** The data presented in Table 6 shows occupation of the father of adolescents. From Vijayawada city majority of boys and girls fathers were 48.00% in service, 42.66% and 32.66% in business and 9.33% and 15.33% were in the professional category. However, no respondent's fathers were observed to be labourers. In Chennai, majority of boys fathers were servicemen (50.66%), followed by businessmen (48%), then professionals (0.66%) and labourer (0.66%) whereas among the majority of fathers were businessman (46.66%), followed by serviceman (34.66%) then professionals (18.66%). None of the girl's father was a laborer.

The data showed that service men were more in Vijayawada than the business men. In Chennai, businessman was more than a serviceman. Professionals were more in Chennai compared to Vijayawada. The above trend was an observation made on the randomly selected samples from both the states. Randomly selected samples are unbiased and are opting to represent the characteristics of the whole.

**Table: 3** Religion-wise distribution of adolescents in Vijayawada and Chennai

S. No.	Place	Gender	Religion-wise distribution			
			Hindu	Muslim	Sikh	Christian
1	Vijayawada	B	150(100)	0	0	0
2		G	149(99.33)	1 (0.66)	0	0
		Total	299 (99.66)	1 (0.33)	0	0
1	Chennai	B	120 (80.00)	13(8.66)	6 (4.00)	11
2		G	123 (82.00)	22(14.66)	1(0.66)	4 (2.66)
		Total	243 (81.00)	35 (11.66)	7 (2.33)	15(5.00)
	Grand Total		542(90.33)	36 (6.00)	7(1.16)	15 (2.5)

Figures in parenthesis indicate percentages

**Table: 4** Academic performance based on gender and weight of adolescents in Vijayawada and Chennai

S. No	Gender % of marks	N		O		U	
		Vijayawada	Chennai	Vijayawada	Chennai	Vijayawada	Chennai
1				Boys			
	40-50%	8 (11.59)	24 (29.62)	5 (20.00)	8(29.62)	2 (3.57}	9(21.42)
	60-70%	32 (46.37)	32 (39.50)	10(40.00)	11 (40.74)	30 (53.57)	28 (66.66)
	80-90%	29 (42.02)	25 (30.85)	10 (40.00)	8 (29.62)	24 (42.85)	5 (11.90)
	Total	69(46.00)	81(54.00)	25 (16.66)	27 (18.00)	56 (37.33)	42 (28.00)
2				Girls			
	40-50%	5(5.61)	0 (0.00)	1 (3.44)	1 (2.70)	2(6.25)	2 (6.89)
	60-70%	29(32.58)	20 (23. 80)	10 (34.48)	10(27.02)	14 (43.75)	7 (24.13)
	80-90%	55 (61.79)	64 (76.19)	18 (62.06)	26 (70.27)	16 (50.00)	20(68.96)
	Total	89 (59.33)	84 (56.00)	29 (19.33)	37 (24.66)	32 (21.33)	29 (19.33)

Figures in parenthesis indicate percentages

The data presented in Table 6 shows occupation of the respondents mothers from Vijayawada and Chennai. Majority of mothers from both the cities were homemakers. Vijayawada 62.00% of boys and 72.66% of girl's mothers and in Chennai 85.33% of boys and 74.00 % of girls mothers were homemakers. None of the respondent's mother from both the city was a laborer.

In Vijayawada 31.33% of boy's mother and 20.66% of girl's mother were in service, followed by 4.00% and 2.00% of business women and 2.66% and 4.66% were professionals. The percentage of professional mothers of girls was higher than that of the boys of Vijayawada. None of the mothers of underweight and overweight boys were professionally occupied and none of the underweight and overweight girl's mothers were business women. In Chennai, 11.33% of boys' and 14.66% of girls mothers were in service followed by 2.66% and 3.33% of the business class. Only 0.66% and boys and 8% of girl's mothers were professionals. Thus, it was observed that girl's

mothers were professionally occupied as compared to boy's mothers. The data reveals that percentage of homemaker mothers were more in Chennai compared to Vijayawada. Followed by service, professionals and least was business women.

**Monthly income** : Income of a family indicates one's status of living in the society. Table 7 and Fig 3 detailed the mean and standard values of monthly income standard range and also indicate the category which the respondents belonged according to the Government of India. The study reported that no subjects were under EWS (Economically Weaker Section) in both the places (Vijayawada and Chennai). From Vijayawada, 8.33% and 91.66% of children were observed under MIG (Middle Income Group) and HIG (High Income Group) respectively.

From Chennai (boys and girls) 23.33% and 74.66 % were under MIG and HIG respectively. Only 2% Boys of normal weight category from Chennai were under LIG Fig 3 depicts distribution of children according to the income levels based

**Table: 5** Education of parents of adolescents in Vijayawada and Chennai

S	Parents No Education	N				O				U			
		Vijayawada		Chennai		Vijayawada		Chennai		Vijayawada		Chennai	
		F	M	F	M	F	M	F	M	F	M	F	M
1	BOYS												
	Xth and below	2(2.89)	2(2.89)	14(17.28)	16(19.75)	1(4.00)	4(16.00)	3(11.11)	6(22.22)	1(1.78)	1(1.78)	18(42.85)	18(42.85)
	XII	18(26.08)	20(28.98)	35(41.20)	33(40.74)	4(16.0)	4(16.00)	5(18.50)	4(14.81)	14(25.0)	18(32.14)	12(28.57)	14(33.33)
	G and Above	49(7.01)	47(68.11)	32(39.50)	32(39.50)	20(80.00)	17(68.00)	19(70.37)	17(62.96)	41(73.21)	37(66.07)	12(28.57)	10(23.80)
2	GIRLS												
	Xth and below	2(2.24)	4(4.49)	6(7.14)	5(5.95)	2(6.89)	3(10.34)	2(5.40)	2(5.40)	0(0.00)	1(3.12)	0(0.00)	0(0.00)
	XII	9(10.11)	26(29.21)	10(11.90)	13(15.47)	5(17.24)	5(17.24)	9(24.32)	10(27.02)	5(15.62)	8(25.00)	3(10.34)	5(17.24)
	G and Above	78(87.64)	59(66.29)	68(120.95)	66(78.57)	22(75.86)	21(72.41)	26(70.27)	25(67.56)	27(84.37)	23(71.85)	26(89.65)	24(84.57)

on the report of technical group Government of India 11<sup>th</sup> five-year plan, (2007-2012). This study shows that the mean monthly income of the family of the subjects from Chennai was higher than that of Vijayawada. SD observed was very high in Chennai because of differences in income levels of respondents. In Vijayawada, SD values were less than the mean values.

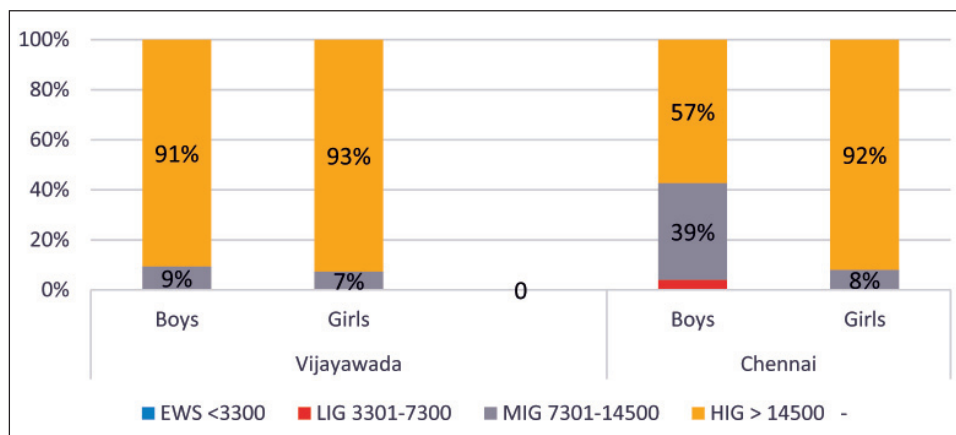
**Socioeconomic status:** The Kuppaswamy's socioeconomic scale was used to measure the socio-economic status of the respondent's families (Table 8, Fig 4). It was categorized into five levels by taking into consideration of education, occupation and income. No respondent was observed under upper lower level and lower level in Vijayawada whereas in Chennai 14.28% underweight boys belong to upper lower level none of the subjects were under lower level. Majority of boys and girls from Vijayawada belong to upper middle-class level 84.66% and 33.33% respectively. In upper-class level the percentage of girls (8.66%) was more than boys (2.66%) and in lower level class it was vice versa i.e. boys (12.66%) and girls (8%).

In Chennai majority of boys and girls were under upper middle-class level i.e. 52.66% and 83.33% respectively. None of the boys belongs to upper-class level whereas 8.66% girls belong to the same level. 43.33% of boys and 11.33% of girls observed under lower class level.

### Discussion

In the 21st century, overweight and obesity among children has become a significant problem mainly in developed countries (5, 6). Studies have shown that an excessively high BMI in childhood increases the risk of obesity in adulthood (7). The problem of overweight and obesity is increasing in Indian children, especially in urban areas (8). Hence, Present study was conducted to classify 600 students from 13 to 15 years in two different urban areas and classified into normal, underweight, overweight and obese. Though, few of them were found underweight main focus was on subjects with overweight and obesity. The





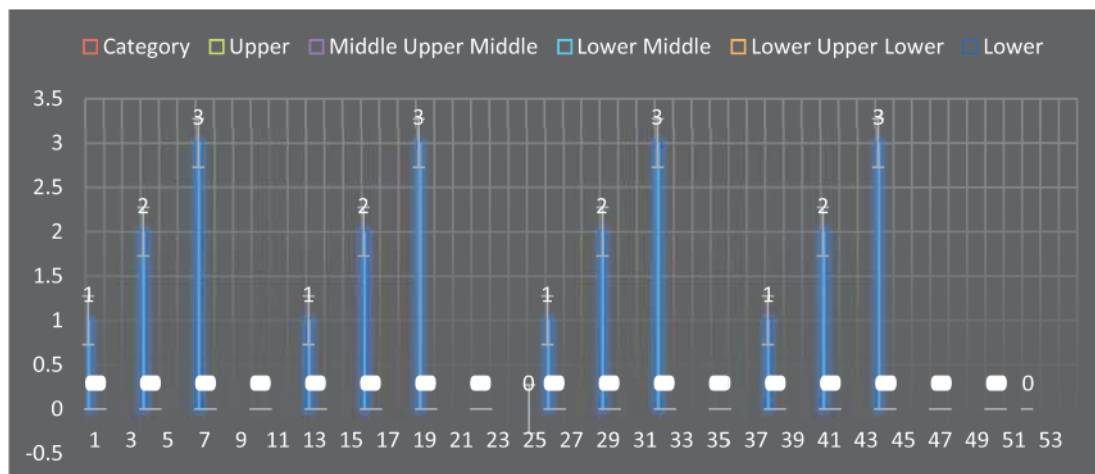
**Fig. 3.** Income group of adolescents in two states

present research work revealed that prevalence of overweight and obesity was 20% and 21% respectively or combine prevalence was 19.8 per cent. According to (9) among adolescents of Aurangabad combined prevalence was 10% (overweight 7% and obesity 3%) which was lower than the present study and slightly higher in a study in Nagpur i.e. a combined prevalence of 21% (overweight 19% and obesity 2%). However, In Aurangabad CDC growth charts were used. In later, (10) was used like present study but sample size was only 150. In Kerala studied by (11) it was found that 10.7% (overweight 7.56% and obesity 3.10%) respectively though the school children belonged to rural area of Kerala. According to (12) observed that in hill states of India prevalence of overall overweight and obesity was 15.6 % which was nearer to present result. The dependency between socioeconomic status and obesity is also noteworthy. (13) Observed that socio-economic status and obesity in children are correlated. Another study has shown that the dependency between socio-economic status and obesity depends on population, gender and age (14). In industrialized countries, groups of low socio-economic status are more likely to be obese than their counterparts in countries with high status, so the risk of obesity in developing countries in particular is increased (15). Recently several industrialized countries reported a stabilization or

even a decrease in childhood overweight and obesity prevalence rates (16). In the present study, the authors drew attention to the type of family, religion, education and occupation of family and monthly income related to the occurrence of overweight and obesity. In current study 21.33% of girls and 37.33% boys in Vijayawada and 19.33% girls and 28% of boys in Chennai were characterized as underweight. In the age group of 13–15 year-old girls and boys, the percentage of subjects underweight was greater than those overweight and obese. Studies by (17) among Polish youth aged 11–15 years showed that the prevalence of body weight deficit in girls was higher than in boys.

It was observed in the present study that a large proportion (81.25% in girls and 87.50% in boys) of Vijayawada and (72.41% in girls and 40.47% in boys) of Chennai adolescents under study was normal. This may be due to socio-economic status (SES) of their parents. The results are in accordance with (18, 19, 20, 21) found that there is prevalence of under nutrition among the girls in the late adolescent group, Hindus, those who lived in joint family, low monthly income and with family size more than 7.

**Summary and conclusion :** The trends of overweight or obesity and underweight in adolescents are important, because it is



**Fig: 4** Socio-economic status of adolescents of Vijayawada and Chennai

associated with adverse effects on health and social effects of both adolescence and adulthood. It is suggested that adolescence is a crucial period of life, since dramatic physiological and psychological changes take place at this age, as it may constitute the last possible growth spurt. During this stage of life the development of physiological health risk factors depends largely on the initiation of health-compromising behavior such as poor eating and inactivity. Studies during adolescence would add support to the primary assumptions given for early interventions to prevent risk factors of non-communicable diseases before behavioral patterns are fully established and resistant to change.

The nutrition and epidemiologic transition is characterized by changes in diet and activity patterns, leading to the development of a double burden of malnutrition. An obesogenic environment which encourages excess food intake plays crucial role in the epidemic of childhood obesity and eating disorders. Multi factors like changes in dietary practices, physical activity, life style pattern and television viewing are reflected in the regulation of fat stores and childhood obesity. The consequences of the adverse health effects of underweight and obesity are likely to be the

development of hypo kinetic diseases such as hypertension, cancer and Type II diabetes as well as reduced health-related physical fitness.

India's problems of malnutrition continue to exist in spite of the efforts by the Government and by the Non-Governmental organizations. Though food security at national level has been achieved the household level nutrition security is yet to be reached. There is no doubt that there is a change in the profile of malnutrition, where very severe forms of child hood malnutrition are considerably lowered but both in children and adults the mild and moderate forms are quite prevalent.

The salient findings of the present research are summarized as follows:

#### **Highlights of the present study**

**Prevalence of malnutrition :** From Vijayawada city, underweight adolescents were 29.33%. Overweight were 18.00% and normal weight were 52.66%. In Chennai underweight children were 26.50%, overweight were 19.66% and adolescents under normal category were 53.83%. In Vijayawada majority of underweight boys were living in joint family whereas underweight girls in nuclear family, in case of overweight category boys were living in nuclear family and overweight girls from Vijayawada lived in extended family.

**Table: 6** Occupation of family members of adolescents in Vijayawada and Chennai

S	Parents	N				O				U			
		Vijayawada		Chennai		Vijayawada		Chennai		Vijayawada		Chennai	
No	Education	F	M	F	M	F	M	F	M	F	M	F	M
1	BOYS												
	Service	29(42.02)	24(34.78)	41(50.61)	10(12.34)	12(48.00)	5(20.00)	14(51.85)	3(11.11)	31(55.35)	18(32.14)	21(32.14)	4(9.52)
	Laborer	0(0.00)	0(0.00)	1(1.23)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)
	Business	31(44.92)	2(2.89)	39(48.14)	1(1.23)	11(44.00)	3(12.00)	13(48.14)	2(7.40)	22(39.28)	1(1.78)	20(47.61)	1(2.38)
	Professional	9(13.04)	4(5.79)	0(0.00)	0(0.00)	2(8.00)	0(0.00)	2(8.00)	0(0.00)	3(5.35)	0(0.00)	1(2.38)	1(2.38)
	Home Maker	-	39(56.52)	-	70(86.41)	-	17(68.00)	-	22(81.48)	-	37(66.07)	-	36(85.71)
2	GIRLS												
	Service	47(52.80)	19(21.34)	31(36.90)	15(17.85)	7(24.13)	5(17.24)	7(18.91)	2(5.40)	18(56.25)	7(21.87)	14(48.27)	5(17.24)
	Laborer	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)	0(0.00)
	Business	35(39.32)	3(3.37)	39(46.42)	5(5.95)	14(48.27)	0(0.00)	19(51.35)	0(0.00)	6(18.75)	0(0.00)	12(41.37)	0(0.00)
	Professional	7(7.86)	3(3.37)	14(16.66)	5(5.95)	8(27.58)	2(6.89)	11(29.72)	3(8.10)	8(25.00)	2(6.25)	3(10.34)	4(13.79)
	Home Maker	-	64(71.91)	-	59(70.23)	-	22(75.86)	-	32(86.48)	-	23(71.85)	-	20(68.96)

Figures in parenthesis indicate percentages

**Socio demographic status :** In case of religion wise distribution it can be concluded that in Vijayawada 99% of subjects belonged to Hindu culture where as in Chennai maximum belonged to Hindu, Muslim followed by Christian and others. Maximum subjects from all groups scored 60- 70% mark. When compared gender wise girls scored more percentage in school academics than boys. None of the normal weight girls scored 40-50% marks. Majority of respondent's parents were literate as graduate and above from both the cities only parents of underweight boys from Chennai the majority was 12<sup>th</sup> pass. Parents of both cities were majority in service and business, maximum father of boys and girls from Vijayawada were professional. Majority of mothers from both the cities were home maker, followed by service and professionals. Most of the respondents from Vijayawada and Chennai belonged to high income group (91.66% and 74.66%) respectively, 2% underweight boys from Chennai belonged to low income group, and rest were under middle income group. The mean monthly income of Chennai was more than Vijayawada.

For future work, primarily this data is collected and further, A nutritional survey is to be scheduled to collect information related to different nutritional status and the parameters planned are anthropometry (section II) clinical (section III) biochemical (section IV) nutritional assessment (section V) psychological test (section VI) and nutrition education (section VII). The major objectives of the research were to give nutritional education of adolescents and its impact on academic performance and emotional maturity.

**Table: 7.** Mean values of monthly income of adolescents in Vijayawada and Chennai

S. No.	Category	Monthly Income (Rs.)			Distribution		
		Mean $\pm$ SD	Range	EWS < 3300	LIG 3301-7300	MIG 7301-4500	HIG > 14500 -
			Vijayawada				
1	VUB	38892.75 $\pm$ 47288.56	300000 6800	0(0.00)	0 (0.00)	4(7.14)	52 (92.85)
2	VOB	32500 $\pm$ 25559.71	100000 8500	0 (0.00)	0 (0.00)	3 (12.00)	22 (88.00)
3	VNB	30750.00 $\pm$ 2457.56	100000 6000	0 (0.00)	0 (0.00)	7(10.14)	62(89.85)
4	Total VUG	33234.37 $\pm$ 24741.56	100000 13000	0 (0.00)	0 (0.00)	14(9.33)	136(90.66)
5	VOG	46120.69 $\pm$ 51166.50	200000 6000	0 (0.00)	0 (0.00)	2 (6.25)	30 (93.75)
6	VNG	31078.65 $\pm$ 23 944. 2 S	200000 9000	0 (0.00)	0 (0.00)	2 (6.89)	27(93.10)
	Total	34617 $\pm$ 34260.02	0 (0.00)	0 (0.00)	25 (8.33)	275 (91.66)	
			Chennai				
1	CUB	17190.48 $\pm$ 10992.21	50000 4500	0 (0.00)	6(14.28)	17(40.47)	19(45.23)
2	COB	40981.48 $\pm$ 28847.57	100000 7500	0 (0.00)	0 (0.00)	6 (22.22)	21 (77.77)
3	CNB	26540.74 $\pm$ 21506.52	100000 6000	0 (0.00)	0 (0.00)	35 (43.20)	46 (56.79)
4	Total CUG	30034.48 $\pm$ 20352.66	100000 10000	0 (0.00)	6 (4.00)	58 (38.66)	86 (57.33)
5	COG	60554.05 $\pm$ 82329.77	350000 6000	0 (0.00)	0 (0.00)	4(13.79)	25 (86.20)
6	CNG	39809.52 $\pm$ 47687.85	300000 10000	0 (0.00)	0 (0.00)	3(8.10)	34(91.89)
	Total			0 (0.00)	0 (0.00)	5 (5.95)	79 (94.04)
	Total	34779.33 $\pm$ 43077.59	0 (0.00)	6 (2.00)	70 (23.33)	12 (8.00)	138 (92.00)
	Grand Total	34698.16 $\pm$ 38886.91	0 (0.00)	(1.00)	95(15.83)	224 (74.66)	499(83.16)

**Table: 8.** Socio-economic status of adolescents in Vijayawada and Chennai

S. No.	Category	Socio-economic status				
		Upper	Middle Upper Middle	Lower Middle	Lower Upper Lower	Lower
			Vijayawada			
1	VNB	4 (5.79)	58 (84.05)	7(10.14)	0 (0.00)	0 (0.00)
2	VOB	0 (0.00)	20 (80.00)	5 (20.00)	0 (0.00)	0 (0.00)
3	VUB	0 (0.00)	49 (87.50)	7(12.5)	0 (0.00)	0 (0.00)
	Total	4 (2.66)	127 (84.66)	19 (12.66)	0 (0.00)	0 (0.00)
1	VNG	5(5.61)	77(86.51)	7 (7.86)	0 (0.00)	0 (0.00)
2	VOG	5 (17.24)	22 (75.86)	2 (6.89)	0 (0.00)	0 (0.00)
3	VUG	3 (9.37)	26(81.25)	3 (9.37)	0 (0.00)	0 (0.00)
	Total	13 (8.66)	125 (83.33)	12 (8.00)	0 (0.00)	0 (0.00)
			Chennai			
1	CNB	0(0.00)	43(53.08)	38(46.91)	0 (0.00)	0 (0.00)
2	COB	0 (0.00)	19(70.37)	8(29.62)	0 (0.00)	0 (0.00)
3	CUB	0 (0.00)	17(40.47)	19(45.23)	6(14.28)	0 (0.00)
	Total	0 (0.00)	79 (52.66)	65 (43.33)	6 (4.00)	0 (0.00)
1	CNG	5(5.95)	74(8.09)	5 (5.95)	0 (0.00)	0 (0.00)
2	COG	4(10.81)	30(81.08)	8(21.62)	0 (0.00)	0 (0.00)
3	CUG	4(13.79)	21(72.41)	4(13.73)	0 (0.00)	0(0.00)
	Total	13 (8.66)	125 (83.33)	17(11.33)	0 (0.00)	0 (0.00)
	GrandTotal	30 (5.00)	456 (76.00)	91 (15.16)	6 (1.00)	0 (0.00)

Figures in parenthesis indicate percentages

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