

## **A Study on the Nutritional Status and It's Association with Parents' Education and Occupation in Young Bengalee Adults of Kolkata, West Bengal**

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### **Abstract:**

**Objectives:** The objective of the present study was to understand the nutritional status and its association with parents' education and occupation in young Bengalee adults.

**Materials and methods:** The present cross-sectional study was conducted on 200 (100 male and 100 female) adult Bengalee individuals of Kolkata. The age range was 18 to 28 years. Information pertaining to age, monthly household income, parents education and occupation were collected. Anthropometric variables include height, weight, mid upper arm circumference (MUAC). Body mass index was calculated.

**Results:** The prevalence of under nutrition by MUAC was higher in female ( $p>0.05$ ). On the other hand the prevalence of under nutrition by BMI was higher in male ( $p<0.05$ ).

**Conclusion:** The result demonstrated a wide variation in nutritional status according to the parent's educational and occupational status.

**Keywords:** Nutritional Status, MUAC, BMI.

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### **I. INTRODUCTION**

The condition of health of a person for intake and utilization of nutrients is called nutritional status. To maintain good health, we need proper diet i.e the food with all nutrients with appropriate amount to meet the need of body. But inadequate nutrients may cause imbalance in body. When there is a lack or excess intake of one or more nutrients or faulty utilization of those, the situation is called malnutrition. It is of two types, one is for lack of nutrients, called under nutrition and another is for excess intake of nutrients called over nutrition. As example of over nutrition, people, who eat energy rich foods excess further than requirement of body become fat. But under nutrition is quite common around us. Malnutrition in women and men can result in reduced productivity, slow recovery of illness, increased susceptibility to infections and a heightened risk of adverse pregnancy outcomes etc.

Since women are potential to birth, the result of malnutrition of an woman highly affects her future generation health. The risk of having a baby with a low birth weight is also higher for mothers who are short (NFHS-III, 2007). Poor health has repercussions not only for women but also their families. Finally, a woman's health affects the household economic well-being, as a woman in poor health will be less productive in the labour force. Due to the wide variation in cultures, religions, and levels of development among India's 28 states and 7 union territories, it is not surprising that women's health also varies greatly from state to state. Numerous studies indicate that malnutrition is another serious health concern that Indian women face (Chatterjee M, 1990; Desai S, 1994; The World Bank, 1996). It threatens their survival as well as that of their children. The negative effects of malnutrition among women are compounded by heavy work demands, by poverty, by childbearing and rearing, and by special nutritional needs of women, resulting in increased susceptibility to illness and consequent higher mortality. While malnutrition in India is prevalent among all segments of the population, poor nutrition among women begins in infancy and continues throughout their lifetimes (Chatterjee M, 1990; Desai S, 1994). Women and girls are typically the last to eat in a family; thus, if there is not enough food they

are the ones to suffer most (Horowitz B and Kishwar K, 1985). Other studies have shown that many women never achieve full physical development (The World Bank, 1996). This incomplete physical development poses a considerable risk for women by increasing the danger of obstructed deliveries.

Hence malnutrition is one of the most devastating. Research Article Vol 1/Issue 1/Oct-Dec 2011 L-82 Life Science Biological Anthropology problems worldwide and inextricably linked with poverty, since this is a huge variation in cultures, religions and level of development worldwide. Under nutrition or malnutrition is considered as a major public health problem and is a significant area of concern in one developing countries like India. Krishnaswami observed that, more than half of the world's undernourished individuals live in India. It is estimated that approximately eight hundred million individuals worldwide are undernourished, of which 258 million are of south Asia and more than 3.6 million mothers and children die each year for malnutrition.

It has been recognized that the techniques of Anthropology has a long tradition to assess nutritional and health status of adults is universally applicable, inexpensive and non-invasive in nature (WHO, 1995; Ferro-Luzzi et al., 1992; James et al., 1994; Pirlich and Lochs, 2001). Though nutritional status of adults can be evaluated in many ways, one important measure is the calculation of Quetelet index, popularly known as Body Mass Index (BMI), which is the body weight (in kg) divided by square of stature (in m) (Keys et al., 1972). BMI is generally considered as a good indicator and used for the assessment of adult nutritional status (Lee & Nieman, 2003; Khongsdier, 2002), especially in the developing countries (Khongsdier, 2002; Ferro-Luzzi et al., 1992; Shetty & James, 1994). Nowadays BMI has been widely used for assessing Chronic Energy Deficiency (CED) (Khongsdier, 2002). Body-mass index is an indicator of overall adiposity, and measures of circumferences are indicators of regional adiposity. Although adult nutritional status can be evaluated in many ways, the BMI is the most widely used because it is inexpensive, noninvasive and suitable for large-scale surveys. BMI is generally considered a good indicator of not nutritional status and socioeconomic condition of adult populations in developing countries. On the other, Mid Upper Arm Circumference (MUAC) is another important indicator for simple screening of adult nutritional status. It has been shown that the MUAC is particularly effective for the determination of malnutrition among adults in developing countries. MUAC is a simpler measure than BMI, requiring a minimum of equipment, and in practice has now been found to predict morbidity and mortality as accurately as deficits in weight (Bose et al., 2006).

### **Objectives:**

The objectives of the present study were to understand the nutritional status and its association with parents education and occupation in young Bengalee adults.

## **II. MATERIALS AND METHODS:**

The present cross-sectional study was conducted on 200 (100 male and 100 female) adult Bengalee subjects of Kolkata, West Bengal, India. The age range of the studied population was 18 to 28 years. Information pertaining to age, monthly household income, parents education and occupation were collected by schedule. Anthropometric variables include height, weight, mid upper arm circumference and were measured following standard techniques (Weiner and Lourie, 1981). Body mass index was also calculated. Height and mid upper arm circumference was measured to the nearest 0.01cm and were measure by anthropometer and steel tape, respectively. Weight was measured to the nearest 0.05kg by using weighing machine.

### **Anthropometric measurements:**

#### **Stature:**

It is the vertical distance from vertex to floor. Each subject was instructed to stand perfectly straight with his arms relaxed by sides and ankles or knee together. The subjects head was positioned in the Frankfurt plane and the anthropometer was positioned behind the subject so that its lower ends stands between the heels and the beam passes vertically between the buttocks touching the back of the head. The graduated cross bar of the movable sleeves was brought down on the top and mid sagittal plane on the head and measurement was taken.

#### **Weight**

It is the total weight of the body and measured by the weighing machine by asking the subject on it with minimum clothing. In this time the floor must be a plane surface.

#### **Mid-Upper-Arm circumference (MUAC) :**

It is the mid circumference of the inferior border of the acromian process to the tip of the olecranon process. The subject's arm hangs in relaxed condition just away from his/her side and the circumference is taken horizontally at the marked level. It was also taken with the help of steel tape.

#### **Body Mass Index (BMI):**

In addition to the measurements obtained directly, body mass index was also calculated using the standard equation.

Body Mass Index (BMI) = weight (kg) / height (m<sup>2</sup>)

Nutritional status:

The nutritional status of individuals was evaluated according to internationally accepted World Health Organization (WHO, 1995) guidelines for adults. Undernourished was defined as BMI less than 18.5, normal as BMI of 18.5 to 24.9 and overweight as BMI more than equal to 25.00.

Nutritional status was also evaluated based on internationally recommended (James et al., 1994) cutoff points for MUAC, according to which in male MUAC less than 23.0 cm in male and 22.0 cm in female indicates undernutrition and MUAC of

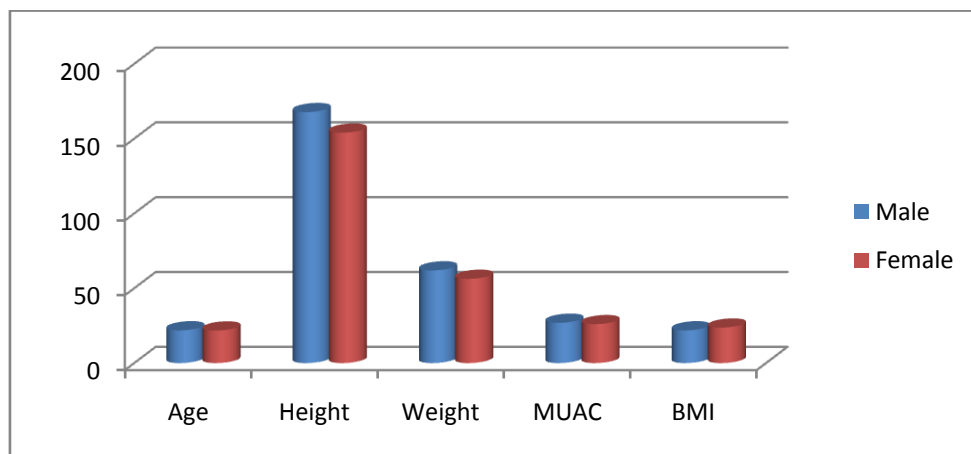
23.0 cm or more in male and 22.0 cm or more in female indicates normal nutritional status.

**Statistical Analysis:**

Statistical analysis includes mean, standard deviation, frequency distribution, t-test and chi-square.

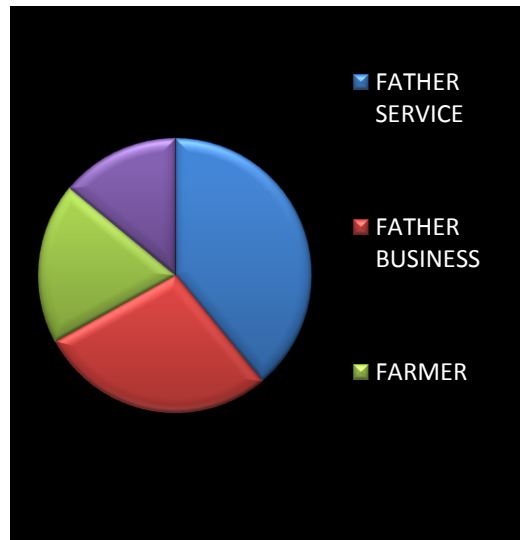
**III. RESULTS & DISCUSSIONS:**

The mean age of male participants are slightly higher than the female participants. On the other hand the monthly household expenditure is higher in case of female participants than the male participants. Height wise males are higher in respect to female candidates. On the other hand weight wise male candidates are heavier than female candidates. Mid Upper arm circumference wise both groups show a similar result. BMI wise both the group show mean of BMI is normal.

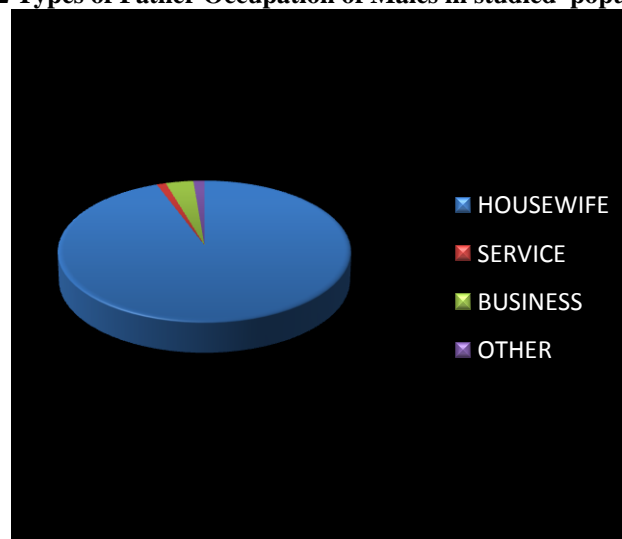


**Fig: 1 Mean Value of Age, Height, Weight, MUAC and BMI in both Males and Females**

In case of male participants their father mostly engaged in service, then business, then farmer then other work, on the other hand mother occupation wise it is revealed that most of the mother engaged as a home maker then service, business and other works. In case of female participants their father is highly engaged as a service than the male participants. After that their father engage business and other occupation. On the other hand mother occupation of female reveals that they also highly engaged as a home maker then service then business then other works.

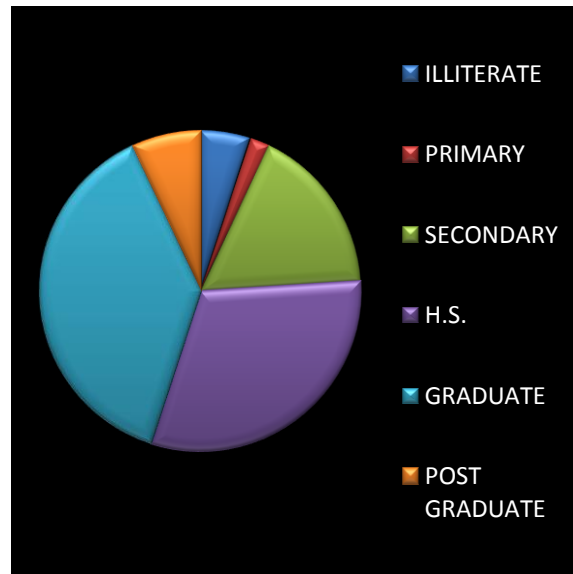


**Fig:2 Types of Father Occupation of Males in studied population**



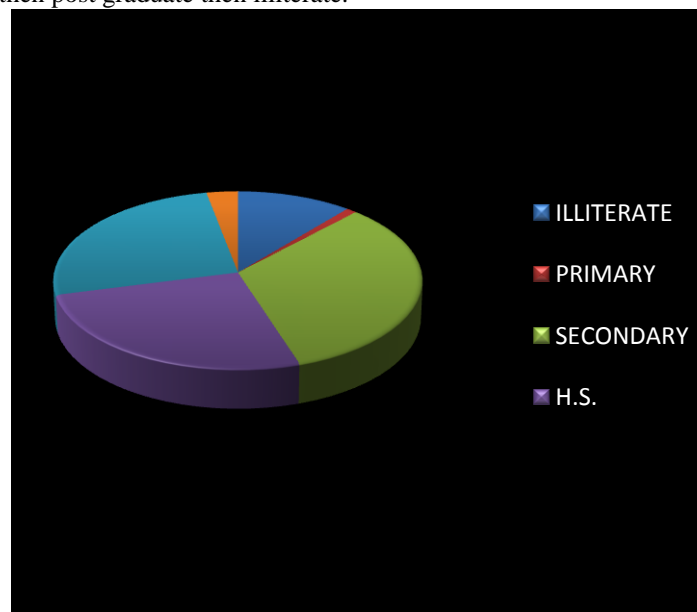
**Fig:3 Types of Mother Occupation of Males in studied population**

When we consider the education of father of the male participants it is revealed that most of the fathers are graduate then higher secondary, then secondary, post graduate, then illiterate then primary educated. In case of mother education of male participants is it showed that secondary educated mother's number are highest then graduate and higher number are same then also we found illiterate post graduate and primary educated mother considerably.



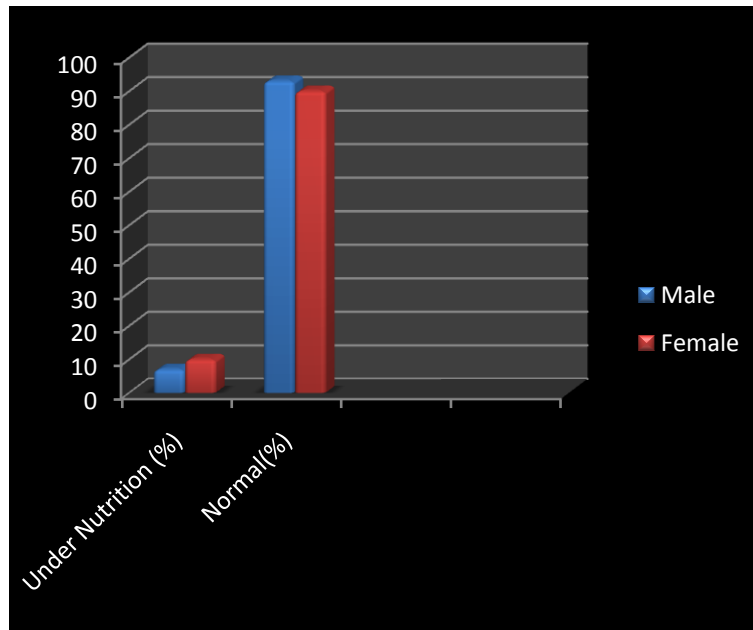
**Fig: 4 Educational Qualification of Father of Males in Studied population**

Educational status of father of females participants reveals that graduate number is highest then higher secondary then secondary and post graduate, on the other hand maximum mothers are graduate then secondary then higher secondary then post graduate then illiterate.



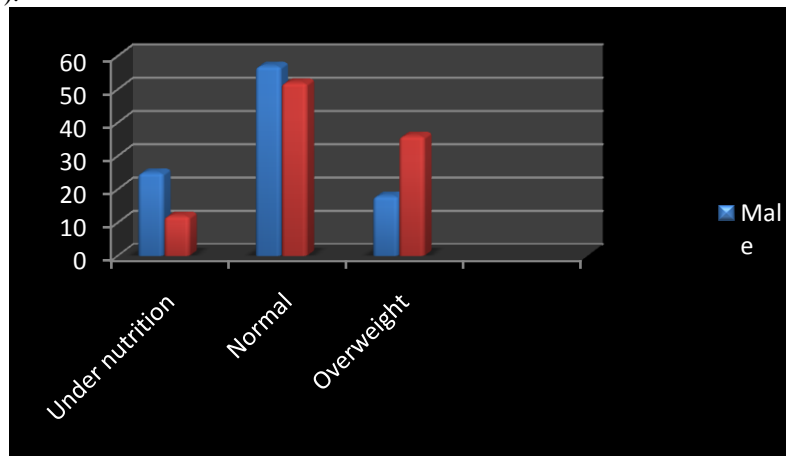
**Fig: 5 Educational Qualification of Mother of Males in Studied population**

MUAC wise maximum male participants are normal nutritional status then under nutrition considerably. On the other hand in case of female participants maximum female express their normal nutritional status then under nutrition. Statistical analysis also reveals that MUAC analysis between males and females, is statistically significant ( $P < 0.05$ )



**Fig: 10 MUAC for both Males and Females**

In case of BMI analysis, it is revealed that 57% of males are normal then under nutrition (25%) then overweight (18%). In case of females they possess 52% are normal then 36% are overweight then 12% are under nutrition. Statistical analysis also reveals that BMI analysis between males and females, is statistically significant ( $P < 0.05$ ).



**Fig: 11 BMI for both Males and Females**

Table 6 shows parents occupation, education and nutritional status by MUAC in male. It revealed that among fathers occupational category service the prevalence of under nutrition and normal were 5.13% and 94.87%. Among fathers occupational category business the prevalence of under nutrition and normal were 17.89% and 82.14%. Among mothers occupational category housewife the prevalence of under nutrition and normal were 7.06% and 92.94%. It also revealed that among fathers with higher secondary, graduate and post graduate education the prevalence of under nutrition were 9.68%, 5.26% and 14.29%, respectively and the prevalence of normal were 87.1%, 94.74% and 85.71%, respectively. Among mothers with secondary, higher secondary and graduate education the prevalence of under nutrition were 3.03%, 7.69% and 15.38%, respectively.

Table 7 shows parents occupation, education and nutritional status by MUAC in female. It revealed that among fathers occupational category service the prevalence of under nutrition and normal were 5% and 54%. Among fathers occupational category business the prevalence of under nutrition and normal were 8% and 92%. Among fathers with other occupational category the prevalence of under nutrition and normal were 18.75% and 81.25%. It also revealed that among mothers occupational category housewife the prevalence of under nutrition and normal 9.76% and 90.24%. Among occupational category service the prevalence of under nutrition and normal were 11.11% and 88.89%. Among occupational category business the prevalence of under

nutrition and normal were 25% and 75%. It also revealed that among fathers with secondary education the prevalence of under nutrition and normal were 9.09% and 90.91%. Among fathers with secondary, graduate and post graduate education the prevalence of under nutrition were 16.67%, 7.94% and 12.8%, respectively, and the prevalence of normal were 83.33%, 92.06%, 87.2%, respectively. Among mothers with secondary, higher secondary and graduate and post graduate education the prevalence of under nutrition were 14.29%, 5.26%, 6.38% and 20%, respectively, and the prevalence of normal were 85.71%, 94.74%, 93.61% and 80%, respectively.

Table 8 shows parents occupation, education and nutritional status by BMI in male. It revealed that among fathers occupational category service the prevalence of under nutrition, normal and overweight were 20.51%, 53.85% and 25.64%, respectively. Among occupational category business the prevalence of under nutrition, normal and overweight were 28.57%, 57.14% and 14.29%, respectively. Among occupational category farmer the prevalence of under nutrition, normal and overweight were 26.32%, 68.42% and 5.26%, respectively. Among other occupational category the prevalence of overweight and normal were 21.43% and 78.57%. Among mothers occupational category housewife the prevalence of under nutrition, normal and overweight were 22.35%, 61.18% and 16.47%, respectively. Among mothers occupational service the prevalence of under nutrition was 1%. Among mothers occupational category business the prevalence of under nutrition and normal were 33.33 and 66.67%. Among other occupational category the prevalence of overweight and normal were 63.64% and 36.37%. It also revealed that among illiterate fathers the prevalence of under nutrition and normal were 40% and 60%. Among fathers with primary education the prevalence of normal and overweight were 50% and 50%, respectively. Among fathers with secondary education the prevalence of under nutrition, normal and overweight were 35.29%, 41.18% and 17.65%, respectively. Among fathers with secondary education the prevalence of under nutrition, normal and overweight were 29.03%, 61.29% and 9.68%. Among graduate fathers the prevalence of under nutrition, normal and overweight were 7.89%, 71.05% and 21.05%, respectively. Among post graduate fathers the prevalence of under nutrition, normal and overweight were 14.29%, 42.89% and 42.89%, respectively. Among illiterate mothers the prevalence of under nutrition, normal and overweight were 36.36%, 54.55 and 9.09, respectively. Among mothers with primary education the prevalence of under nutrition was 1%. Among mothers with secondary education the prevalence of under nutrition, normal and overweight were 21.21%, 60.61% and 18.18%, respectively. Among mothers with higher secondary education prevalence of under nutrition, normal and overweight were 19.23%, 73.08% and 7.69%, respectively. Among graduate mothers the prevalence of under nutrition, normal and overweight were 15.38%, 61.54% and 23.08%, respectively.

Table 9 shows parents occupation, education and nutritional status by BMI in female. It revealed that among fathers occupational category service the prevalence of under nutrition, normal and overweight were 15.25%, 50.85% and 33.9%, respectively. Among occupational category business the prevalence of under nutrition, normal and overweight were 4%, 72% and 24%, respectively. Among other occupations the prevalence of under nutrition, normal and overweight were 16.67%, 43.75% and 50%, respectively. In case of mother's occupational category housewife the prevalence of under nutrition, normal and overweight were 10%, 20% and 30%, respectively. Among mothers occupational category service the prevalence of normal and overweight were 77.78% and 22.22%. Among occupational category business the prevalence of under nutrition, normal and overweight were 25%, 50% and 25%, respectively. Among other occupations the prevalence of normal and overweight were 80% and 20%. It also revealed that among fathers with secondary education the prevalence of under nutrition, normal and overweight were 18.18%, 54.54% and 27.27%, respectively. Among fathers with higher secondary education the prevalence of under nutrition, normal and overweight were 27.78%, 44.44% and 27.78%, respectively. Among fathers with graduate education the prevalence of under nutrition, normal and overweight were 6.35%, 55.56% and 38.1%, respectively. Among fathers with post graduate education the prevalence of normal and overweight were 75% and 25%. Among illiterate mother prevalence of overweight was 1%. Among mothers with secondary education the prevalence of under nutrition, normal and overweight were 25%, 53.57% and 21.43%, respectively. Among mothers with higher secondary education the prevalence of normal and overweight were 73.68% and 26.31%. Among mothers with graduate education the prevalence of under nutrition, normal and overweight were 8.51%, 46.81% and 44.68%, respectively. Among mothers with post graduate education the prevalence of normal and overweight were 80% and 20%.

#### **IV. CONCLUSION:**

Thus in conclusion, the prevalence of under nutrition by MUAC was higher in female. On the other hand the prevalence of under nutrition by BMI was higher in male. However, the prevalence of overweight was higher in female. The result also demonstrated wide variation in nutritional status according to parents educational and occupational status.

**TABLE:1 The mean age, monthly household income and anthropometric characteristics of the males**

Variables	Mean	SD
Age (year)	21.88	2.57
Monthly house hold income (Rs.)	20933.00	18673.06
Height (cm)	167.75	60.76
Weight (kg)	61.93	20.67
Mid Upper Arm Circumference (cm)	26.92	3.13
Body mass index (kg/m <sup>2</sup> )	21.86	4.39

**TABLE:2 The mean age, monthly household income and anthropometric characteristics of the females**

Variables	Mean	SD
Age (year)	21.76	1.65
Monthly house hold income (Rs.)	30335.00	19977.39
Height (cm)	154.00	49.95
Weight (kg)	56.31	12.88
Mid Upper Arm Circumference (cm)	26.01	4.13
Body mass index (kg/m <sup>2</sup> )	23.70	5.02

**Table:3 Parents Occupation And Education Of Males In The Studied Population**

Variables	N	%
<b>Fathers Occupation</b>		
Service	39	39
Business	28	28
Farmer	19	19
others	14	14
<b>Mothers occupation</b>		
House wife	85	85
Service	1	1
Business	3	3
Others	11	11
<b>Fathers education</b>		
illiterate	5	5
Primary	2	2
secondary	17	17
Higher Secondary	31	31
Graduate	38	38
Post graduate	7	7
<b>Mothers education</b>		
illiterate	11	11
Primary	1	1
secondary	33	33
Higher Secondary	26	26
Graduate	26	26
Post graduate	3	3

**TABLE: 4 Parents occupation and education of females in the studied population**

Variables	N	%
<b>Fathers Occupation</b>		
Service	59	59
Business	25	25
Others	16	16



<b>Mothers occupation</b>		
House wife	82	82
Service	9	9
Business	4	4
Others	5	5
<b>Fathers education</b>		
Secondary	11	11
Higher Secondary	18	18
Graduate	63	63
Post graduate	8	8
<b>Mothers education</b>		
illiterate	1	1
secondary	28	28
Higher Secondary	19	19
Graduate	47	47
Post graduate	5	5

**TABLE: 5 Nutritional status by MUAC and BMI in the studied population**

	MUAC		Chi-Square =0.579 p>0.05	BMI			Chi-Square = 10.015 p<0.05
Variables	Under nutrition (%)	Normal (%)		Under nutrition (%)	Normal (%)	Overweight (%)	
Male	7	93		25	57	18	
Female	10	90		12	52	36	

**TABLE: 6. Parents occupation, education and nutritional status by MUAC in male**

Variables	Undernourished	Normal
<b>FATHER OCCUPATION</b>	%	%
SERVICE	5.13	94.87
BUSINESS	17.89	82.14
FARMER	0	100
OTHERS	0	100
<b>MOTHER OCCUPATION</b>		
HOUSEWIFE	7.06	92.94
SERVICE	100	0
BUSINESS	0	100
OTHER	0	100
<b>FATHER EDUCATION</b>		
ILLITARATE	0	100
PRIMARY	0	100
SECONDARY	0	100
HIGHER SECONDARY	9.68	87.1
GRADUATE	5.26	94.74
POST GRADUATE	14.29	85.71
<b>MOTHER EDUCATION</b>		
ILLITARATE	0	100
PRIMARY	0	100
SECONDARY	3.03	96.99

HIGHER SECONDARY	7.69	92.31
GRADUATE	15.38	84.62
POST GRADUATE	0	100

**TABLE: 7 Parents occupation, education and nutritional status by MUAC in female**

Variables	Undernourished	Normal
	%	%
<b>FATHER OCCUPATION</b>		
SERVICE	8.47	91.53
BUSINESS	8	92
OTHERS	18.75	81.25
<b>MOTHER OCCUPATION</b>		
HOUSEWIFE	9.76	90.24
SERVICE	11.11	88.89
BUSINESS	25	75
OTHER	0	100
<b>FATHER EDUCATION</b>		
ILLITARATE	0	0
PRIMARY	0	0
SECONDARY	9.09	90.91
HIGHER SECONDARY	16.67	83.33
GRADUATE	7.94	92.06
POST GRADUATE	12.8	87.2
<b>MOTHER EDUCATION</b>		
ILLITARATE	0	100
PRIMARY	0	0
SECONDARY	14.29	85.71
HIGHER SECONDARY	5.26	94.74
GRADUATE	6.38	93.62
POST GRADUATE	20	80

**TABLE: 8 Parents occupation, education and nutritional status by BMI in male**

Variables	Undernourished (%)	Normal (%)	Overweight (%)
<b>FATHER OCCUPATION</b>			
SERVICE	20.51	53.85	25.64
BUSINESS	28.57	57.14	14.29
FARMER	26.32	68.42	5.26
OTHERS	0	78.57	21.43
<b>MOTHER OCCUPATION</b>			
HOUSEWIFE	22.35	61.18	16.47
SERVICE	100	0	0
BUSINESS	33.33	66.67	0
OTHER	0	63.64	36.37
<b>FATHER EDUCATION</b>			
ILLITARATE	40	60	0
PRIMARY	0	50	50
SECONDARY	35.29	41.18	17.65
HIGHER SECONDARY	29.03	61.29	9.68
GRADUATE	7.89	71.05	21.05
POST GRADUATE	14.29	42.86	42.89
<b>MOTHER EDUCATION</b>			
ILLITARATE	36.36	54.55	9.09
PRIMARY	100	0	0

SECONDARY	21.21	60.61	18.18
HIGHER SECONDARY	19.23	73.08	7.69
GRADUATE	15.38	61.54	23.08
POST GRADUATE	0	0	100

**TABLE: 9 Parents occupation, education and nutritional status by BMI in female**

Variables	Undernourished (%)	Normal (%)	Overweight (%)
<b>FATHER OCCUPATION</b>			
SERVICE	15.25	50.85	33.9
BUSINESS	4	72	24
OTHERS	16.67	43.75	50
<b>MOTHER OCCUPATION</b>			
HOUSEWIFE	12.2	24.39	36.58
SERVICE	0	77.78	22.22
BUSINESS	25	50	25
OTHER	0	80	20
<b>FATHER EDUCATION</b>			
ILLITARATE	0	0	0
PRIMARY	0	0	0
SECONDARY	18.18	54.54	27.27
HIGHER SECONDARY	27.78	44.44	27.78
GRADUATE	6.35	55.56	38.1
POST GRADUATE	0	75	25
<b>MOTHER EDUCATION</b>			
ILLITARATE	0	0	100
PRIMARY	0	0	0
SECONDARY	25	53.57	21.43
HIGHER SECONDARY	0	73.68	26.31
GRADUATE	8.51	46.81	44.68
POST GRADUATE	0	80	20

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