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Body Composition and Nutritional Status of Bengali Women Migrated from Bangladesh and Living in the Slums Built Near the Railway Tracks in West Bengal, India

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ABSTRACT

64 Bengali women who had migrated from neighboring country, Bangladesh were studied for their nutritional status, fat % and body composition. calorie intake. The migrated women were from poor socioeconomic status where the family heads were involved in daily labor job and women were attached with domestic works as maid. Though the women were from poor families, but all of them had good food intake from the houses where they work as housemaid. The studied women group were from both Hindu and Muslim families with an age ranged from 35-52 yr. An average height of 150.2 ±3.97 cm was observed with an average weight of 58.9 ±6.43 kg. Average BMI was 26.1 ±2.4 kg/ht^2 with a range between 21.2 kg/ht^2 and 31.6 kg/ht^2. Average fat % was 28.4 ±3.3 with a range of 20.2 -35.3%. When BMI was considered for nutritional status, 28.2% were in normal range whereas 67.2 % were and 4.6 % were obese. This was also reflected in fat % where average 28.4 ±3.3 % fat was observed with a range of 20.2% -35.3 %. Only fourteen percent women possessed an average fat % in between 20% and 24.9%, but rest were with high fat %. 51.6 % were in between 25 % and 30% and rest were over 30 %. Thus, 86% of the women were fatty with high fat amount. Thus, the women, though, were from poor socio-economic status, but the status did not affect their food intake as they had sufficient food to eat where they work as housemaid. This was unexpected findings of the present study.

INTRODUCTION

Bangladesh is the neighboring country of India next to Indian province of West Bengal. Every year a large number of men and women illegally enter into West Bengal and take shelter in unauthorized encroachments on the vacant place in railway areas on both sides of railway tracks. Around 5.7 million Bangladeshis migrated in India and a large numbers are living in West Bengal (Jamwal 2017). Most of them are settled in 24 pgs district of West Bengal and took shelter in encroachment on the roadside (locally called Jhupri), canals (Locally called Khaldhar), or vacant railway lands near the railway track. Concentration of migrants are observed mainly in North 24 Parganas, Kolkata and Nadia districts of West Bengal. The socio-economic condition of all these migrated families were very low and very difficult to arrange proper diet, even day-to-day earning made them to starve sometimes (Datta 2004, Sen 2015).

The present study was designed to study the body composition, nutritional status based on Body Mass Index (BMI) and fat % of the middle age women who lived in the unauthorized built houses in both sides of railway tracks.

MATERIALS AND METHODS

Subjects: 64 Bengali Bangladeshi migrated women were measured randomly from the slums built near the railway track run between Dumdum Cant railway station and Durganagor railway station in north 24 paraganas district of West Bengal. All the families from where women were measured migrated from Bangladesh and living in India for the last few years only. The population is mixed from Hindu and Muslim communities.

Anthropometrical measurements: Height and body weight was measured with an Anthropometric Rod (CESCORF, Brazil) and electronic weighing scale (OMRON, India). Measurement was done according to the standard method recommended by International Society for the Advancement of Kinanthropometry (ISAK 2011).

Skinfold Thickness: Biceps, Triceps, Subscapular and Supraspinale skinfold thicknesses were measured with a Harpenden skinfold caliper (Bety Int, UK).

Body Fat %: Body fat % was calculated using the equation of Siri (1956).

Durnin and Womersley (1974) technique was followed for Body density.

Body fat % = (495/Body density) — 450.

Body density = 1.1423-0.0632 log (Biceps +Triceps+ Subscapular + Supraspinale) for 30-39yr female

Body density = 1.333-0.0612 log (Biceps +Triceps+ Subscapular + Supraspinale) for 40-49 yr female

Body density = 1.1339-0.0645 log (Biceps +Triceps+ Subscapular + Supraspinale) for 50 yr and above.

Body Mass Index: Body Mass Index (BMI) was calculated using the equation where BMI = Weight (kg) / Height(m)^2. Nutritional status was determined using WHO guideline based on BMI (WHO 2017).

Statistical analysis: Statistical package SPSS 10.0 was used for statistical analysis.

Socioeconomic Status: Socioeconomic status was assessed by Kuppuswamy scale (1981) revised by Shaikh and Pathak (2016). Kuppuswami scale was a widely used method to measure the socio-economic status of an individual in a society. It was based on three variables namely education, occupation and income. Kuppuswami scale was modified later on, where the education, occupation of the head of the family and income per capita per month was used

This scale consists of composite scores of education and occupation of the head of the family along with monthly income from all the sources of the family. It yields a score of 3 – 29 and it classifies the study population into high, middle and low socioeconomic status (SES). Of the three variables, education and occupation of the head of the household do not change frequently with time. However, the steady inflation and the resultant devaluation of the rupee necessitate periodic revisions of the income variable. The changes in the income scale are proportional to the change in AICPI. The AICPI values are interpreted with reference to a particular base year. The previous base years were 1960, 1982 and at present 2016 year was considered as base year. Following tables showed the scoring method for SES estimation.

SCORING FOR MODIFIED KUPPUSWAMY'S SOCIO-ECONOMIC STATUS SCALE,

REVISED FOR 2016

EDUCATION	SCORE
Professional or honors	7
Graduate or postgraduate	6
Intermediate or post-high school diploma	5
High School Certificate	4
Middle School certificate	3
Primary School certificate	2
Illiterate	1
OCCUPATION	SCORE
Professional	10
Semi-Professional	6
Clerical, Shop Owner, Farmer 5 Skilled Worker 4 Semi-Skilled Worker	3
Unskilled Worker	2
Unemployed	1
FAMILY INCOME PER MONTH IN RUPEES (August 2016 current price index for industrial workers)	SCORE
≥ 42,876	12
21,438-42,875	10
16,078-21,437	6
10719-16,077	4
6,431-10,718	3
2,165-6,430 2	2
≤2164 1	1

KUPPUSWAMY'S CLASSIFICATION OF SOCIO-ECONOMIC CLASSES ACCORDING TO SCORE.

CLASS	TOTAL SCORE
Upper class (I)	26-29
Upper middle class (II)	16-25
Lower middle class (III)	11-15
Upper lower class (IV)	5-10
Lower class (V)	<5

RESULTS

Table 1: Average physical characteristics , Body fat % , Fat Free Mass (FFM) , BMI of Bengali migrtaed women of the present study

N=64	Age (yr)	Height (cm)	Weight (kg)	BMI ($kg.m^{-2}$)	Fat %	FFM
Mean	44.4	150.2	58.9	26.1	28.4	42.1
STDev	4.0	3.97	6.4	2.4	3.3	3.7
Min	35	137.9	43	21.2	20.2	30.8
Max	52	156.3	74	31.6	35.3	45.7

Table 2: Nutritional status of Bengali migrated women of the present study.

Category	BMI ($kg.m^2$) Cut-off points	Frequency	%
Normal	18.50-24.99	18	28.2
Overweight	≥ 25.00		
Pre- obese	25.00-29.99	43	67.2
Obese	≥ 30.00	3	4.6

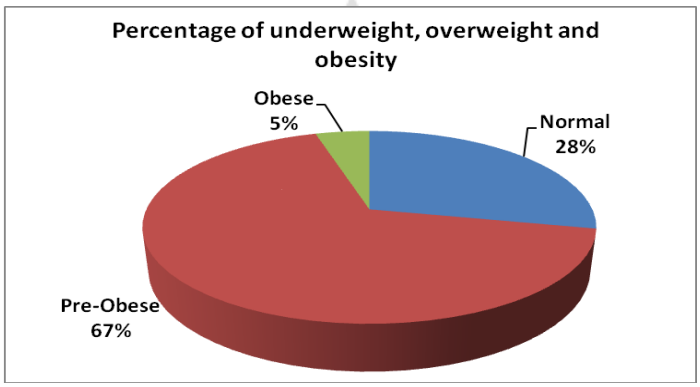

Fig 1: Underweight, overweight and obesity of Bengali migrated women based on BMI

Table 3: The International Classification of adult underweight, overweight and obesity according to BMI (Source: adapted from WHO, 1995, WHO 2000, WHO 2004, 2017)

Classification	BMI(kg/m^2)	
	Principal cut-off points	**Additional cut-off points**
Underweight	**<18.50**	**<18.50**
Severe thinness	<16.00	<16.00
Moderate thinness	16.00 - 16.99	16.00 - 16.99
Mild thinness	17.00 - 18.49	17.00 - 18.49
Normal range	**18.50 - 24.99**	**18.50 - 22.99**
		23.00 - 24.99
Overweight	**≥25.00**	**≥25.00**
Pre-obese	25.00 - 29.99	25.00 - 27.49
		27.50 - 29.99
Obese	**≥30.00**	**≥30.00**
Obese class I	30.00 - 34.99	30.00 - 32.49
		32.50 - 34.99
Obese class II	35.00 - 39.99	35.00 - 37.49
		37.50 - 39.99
Obese class III	≥40.00	≥40.00

DISCUSSION

In the present study, average age of the Bengali women was 150.2 ± 3.97 cm with an average weight of 58.9 ± 6.43 kg. The average age was 44.4 ± 4.0 yr with an age range between 35 yr and 52 yr. The body weight was much higher than 50 kg for reference adult Indian women with age range of 20-50 yr. The average body weight of the present study was also higher than the Bangladeshi Bengali women which was 40.5 ± 4.6 (22.2–61.2) in average reported by Hosegood and Campbell (2003). The higher body weight was also reflected in higher amount of fat % which was 28.4 ± 3.3 % in average with a range between 20.2-35.3 %. When underweight, normal, overweight and obesity were evaluated considering BMI as an indicator, 67.2 % women were Pre-obese, 4.6 % women were obese and only 28.2 % normal. Nobody was there underweight. Average BMI was 26.1±2.4 kg/ht^2 with a range of 21.2-32.6 kg/ht^2.

The families which migrated from the neighboring country Bangladesh were from very poor socio-economic status. The reason they migrate was the poor economical condition in their own country which forced them to leave for better life. Thus, when they migrate in India, they had the only option to take shelter in slums in different areas. Most of them take shelter

in the slums built near the railway track from Sealdah to Bongaon railway lines which was easy to access. Poverty is the central characteristic of slum area. Thus the women studied in the present study, were all from very poor socio-economical status. Most of the male family members work as a daily labor and women work as maidservant or maid of all work in houses or apartment in nearby areas. As these women work as a maid for all work from morning to evening, they are provided same food which are prepared for the family members and they are also allowed to carry out the excess food in the evening. So, though the women were from very poor socio-economic families, but individually they have sufficient food to eat which they got it from the families where they work. This might be the reason for high body fat percentage with pre-obese and obese in weight category. Poor socio-economic status did not affect the individual body composition and nutritional status which supposed to be low fat % and low body weight category.

There may be one more reason, the Thrifty phenotype hypothesis. According to the thrifty phenotype hypothesis, nutritional deprivation early in life gives rises to adaptive mechanisms that could result in greater susceptibility to obesity in adult life (Hales and Barker 2001, Wells 2007). While high-energy diet and sedentary lifestyle is the main cause of obesity in developed countries (James 2008, Choi et al 2005), but these features fail to completely explain the epidemic of obesity in developing countries (Benyshek 2007, Barker 2007, Alves et ai 2011,). Thus pre-obese and obesity tendency of the present study may be due to nutritional deprivation early in life. More study is required for final comment.

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