Original Research Article

Socio-Demographics Features of Obesity and Blood Pressure and Correlation with Their Dietary Pattern

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Abstract

Background: Socio- demographic and dietary patterns are considered as a modifiable risk factor for obesity and hypertension. Marked increase intake of junk food associated with the higher risks for hypertension and obesity.

Aim: The purpose of this study was to determine the socio-demographic characteristics and dietary pattern in adolescent and their relationship with hypertension and obesity.

Methods: This was a cross sectional study conducted in a tertiary care medical college, central India, using a predesigned questionnaire-based interview. Adolescent subjects were randomly. Selected from various higher secondary schools Parameters Weight, height, waist circumference, Waist / hip ratio, body mass index (BMI), blood pressure and random blood sugar were noted.

Results: A total of 350 schools going adolescent were enrolled in this study. Prevalence of hypertension was 20.8% and obesity was 4.5%. The dietary habits (vegetarian, Fast food/week, and food choice), gender and mother occupation was found no significant association with obesity, whereas father's occupation and weightof adolescents was found to be significantly associated with the overweight or obesity. Fast food consumption and choice of fast Food over HealthyFood was significantly associated with hypertension.

Conclusion: Socio-demographic and dietary modification should help in implications for the prevention and management of obesity and hypertension in adolescent population.

Keywords: Dietary Pattern, Socio-Demographic Characteristics, Hypertension, Obesity.

Introduction

With rapid economic growth, demographic transition and changes in lifestyle and dietary habits, the prevalence of chronic non-communicable diseases (NCDs) are increasing globally. The nutrition transition has accompanied a rise in the prevalence of overweight and obesity in India [1] with an estimated 166 million adults overweight or obese in 2016 [2]. The overweight and obesity is an important factor for increase in prevalence of other chronic diseases such as cardiovascular diseases, hypertension, diabetes, dyslipidaemia and some types of cancers. NCDs typically occurs among individuals aged 55 years or older in many developed countries, but in India it occurs a decade earlier (≥45 years of age) [3,4].

Hypertension is one of the major risk factors affecting the global burden of disease and is one of the most important risk factors for cardiovascular disease [5]. It was reported that a 10 mmHg reduction in systolic blood pressure (BP) could lower the risk of major stroke by 27%, heart failure by 28% and cardiovascular disease events by 20%. Therefore, the primary prevention of hypertension has now become a top priority for global public health [6]. The decision to render the phrase "*Control your blood pressure*" as the theme for 2013World Health Day signified increasing recognition that elevated blood pressure (EBP) or hypertension is an important global public health concern [7]. Similarly, non-communicable diseases were highlighted in the 2012WorldHealth Statistics

report in which hypertension was estimated to contribute to more than one-half of the deaths from stroke and about 45% of deaths from heart disease [8]. Accumulating evidence has suggested that diet plays a significant role in the development and progression of hypertension [9, 10].

An increasing number of evidences have linked diet with the risk of developing non-communicable chronic diseases, such as obesity, type 2 diabetes, cardiovascular diseases, and certain types of cancer. Identification of dietary components that may play a role in their prevention has become a major concern for researchers and public health authorities. While initial approach in the nutrition research was based on the investigation of individual nutrients or foods, recently the attention turned to the identification and analysis of dietary or food consumption patterns [11].

Materials and Methods

This cross sectional study was conducted in a tertiary care medical college, central India, using a predesigned questionnaire based interview. Subjects were selected from various higher secondary schools including Public school, Government school, and Central Government School. Individual schools and classes were selected randomly. Survey methods were explained to the school authorities in detailed and written consent was taken from the parents. Those students who were willing to participate in the study and whose parents gave consent were asked to fill the predesigned questionnaire data. Subsequently student completed the survey in the presence of teachers and researchers on the school premises.

Parameters Weight, height, waist circumference, Waist / hip ratio, body mass index (BMI), blood pressure and random blood sugar were noted.

Participants of 9-16 years age group with both gender, whose parent provide consent for the study were included in our study

Subject with known psychiatric disorder, known chronic kidney, Heart and Tubercular disease were excluded from the study.

Standardized Definition of Childhood Hypertension in This Systematic Review:

Normal blood pressure: <90th percentile for age, sex and height; or <120/<80 (systolic/diastolic) mm Hg for adolescents ≥13-year-old

Elevated BP: BP reading ≥90th percentile and <95th percentile for age sex and height; or 120-129/<80 mm Hg for adolescents ≥13-year-old

Hypertension: BP >95th percentile for age, sex, and height; or ≥130/80 mm Hg for adolescents ≥13-year-old

Weight Categories on the basis of percentile

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Under weight	Less than 5th percentile
Normal weight	5th percentile to less than 85th percentile
Overweight	Greater than or equal to 85th percentile to less than 95th percentile

- Short stature is defined as height below 3rd percentile or less than two standard deviations above the mean for normal population of same age, sex region and race.

- Tall stature height is defined as above 97th percentile or two standard deviations above the mean for normal population of same age, sex, region, and race.

Statistically analysis: The data were analysed by using SSPS (IBM SPSS Inc. USA) version 22.

Variables were presented as percentage or mean ± standard deviation (SD). Student's t-test, ANOVA and chi-square test was used for analysis. P value <0.05 was considered as statistically significant.

Results

A total of 350 schools going adolescent were enrolled in this study. Prevalence of hypertension was 20.8% (73/350) and obesity was 4.5% (16/350).
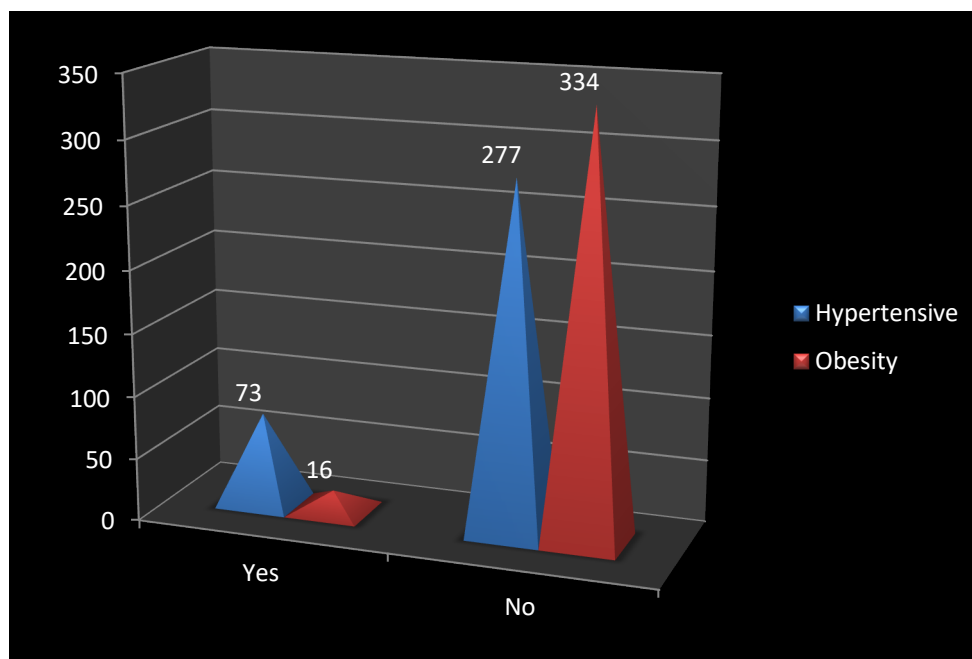
Graph 1: Distribution of adolescents on the basis of blood pressure and obesity

The Mean of systolic blood pressure was 109.20±16.12 mmHg and Mean ofdiastolic blood pressure was 66.90 ± 13.98 mmHg.

Table 1: Mean and standard deviation of blood pressure

Blood pressure				95% Confidence Level of Mean	
	N	Mean	Std. Deviation	Lower	Upper
Systolic BP(mm/Hg)	350	109.20	16.12	107.53	111.06
Diastolic BP (mm/Hg)	350	66.90	13.98	65.41	68.44
Percentile ofBP (systolic)	350	59.73	31.52	56.49	63.32
Percentile of BP(diastolic)	350	60.87	28.45	57.68	63.92

The dietary habits (vegetarian, Fast food/week, and food choice), gender and mother occupation was found no significant association with obesity, whereas father's occupation and weight of adolescents was found to be significantly associated with the overweight or obesity [table: 2].

Table 2: Association of weight of adolescents with diet, socio demographicfeatures and waist hip ratio

		Normal weight	Overweight	Obesity	Under weight	P value
Diet	Vegetarian	122(61.3%)	5(2.5%)	4 (2%)	68 (34.2%)	0.846
	Non vegetarian	82(54.3%)	3(2%)	4 (2.6%)	62 (41.1%)	
Father's Occupation	Unemployed	8(61.5%)	1(7.7%)	0 (0%)	4 (30.8%)	**0.048**
	UnskilledWorker	70(51.9%)	1(0.74%)	4 (3%)	60 (44%)	
	SemiskilledWorker	20(64.5%)	0(0%)	1(3.1%)	10(32.2%)	
	Skilled Worker	26(50%)	4(8%)	2(3.8%)	20(38.4%)	
	Clerical, Shop Owner, Farmer	77(68.7%)	1(0.9%)	1(0.9%)	33(29.4%)	
	Semi professional	1(50%)	0 (0%)	0(0%)	1(50%)	
	Professional	2 (50%)	1(25%)	0 (0%)	1 (25%)	
Mother's occupation	Working	18 (56.2%)	0 (0%)	0 (0%)	14 (43.8%)	0.746
	House wife	186 (58.5%)	8 (2.5%)	8 (2.5%)	116 (36.5%)	
Gender	Male	85 (53.8%)	6 (3.8%)	6 (3.8%)	61 (38.6%)	0.191
	Female	119(62.3%)	2(1%)	2 (1%)	68(35.6%)	
Fast food/week	Never	41(58.5%)	2(2.8%)	2(2.8%)	25(35.7%)	0.948
	Sometimes	134(51.8%)	5(2.2%)	4(1.7%)	89(38.3%)	
	Most of thetimes	29(60.4%)	1(2.1%)	2(4.1%)	16(33.3%)	
Fast Food	Never	10(83.3%)	0(0%)	0(0%)	2(16.7%)	0.590

Vs Healthy Food Choose	Sometimes	112(54.6%)	6(2.9%)	6(2.9%)	81(39.5%)	
	Most of thetimes	71(62.3%)	1(0.9%)	2(1.7%)	40(35%)	
	Always	11(57.9%)	1(5.3%)	0(0%)	7(36.8%)	
Waist hip Ratio		0.84 ± 0.14	0.86 ± 0.04	0.88± 0.03	0.85 ± 0.06	0.902

Fast food consumption and choice of fast Food over Healthy Food was significantly associated with hypertension. No significant co relation was found between the socio demographic factors studied and occurrence of hypertension.

Table 3: correlation of blood pressure with socio demographic features and dietary pattern of adolescent

Socio- demographic /dietary features		Normotensive	Hypertensive	P value
Diet	Vegetarian	161(80.9%)	38(19%)	0.580
	Non vegetarian	116 (76.8%)	35 (23.1%)	
Father's Occupation	Unemployed	10 (76.9%)	3 (23.1%)	0.221
	Unskilled Worker	113 (83.7%)	22(16.3%)	
	SemiskilledWorker	27 (87.1%)	4 (12.9%)	
	Skilled Worker	35 (67.3%)	17 (32.6%)	
	Clerical work, Shop Owner, Farmer	86 (76.7%)	26 (23.2%)	
	Professional	4 (80%)	1 (20%)	
Mother's occupation	Working	28 (87.5%)	4 (12.5%)	0.474
	House wife	249 (78.3%)	69 (21.7)	
Gender	Male	116 (73.4%)	42 (26.5%)	0.053
	Female	161 (83.9%)	31(16.1	
Fast food/week	Never	64 (91.4%)	6 (8.6%)	**<0.001**
	Sometimes	201(86.6%)	31(13.4%)	
	Most of the times	12 (25%)	36 (75%)	
Preference of fast Food over Healthy Food	Never	11 (91.7%)	1(8.3%)	**<0.001**
	sometimes	172 (83.9%)	33(16.1%)	
	Most of the times	91 (79.8%)	23 (20.2%)	
	Always	3 (15.8%)	16 (84.2%)	
Waist hip Ratio		0.85 ± 0.12	0.85 ± 0.08	0.821

Discussion

Dietary patterns can be a proxy indicator of the real food consumption and every day eating habits, thereby providing an alternative approach to understand the relationship between diet and risk of diseases.

The prevalence of adolescent hypertension in this study was 20.8%, which was consistent with the Yin R et al [12] and Wang Y, et al [13].

Present study observed very low prevalence of obesity, concordance with the Pimenta A, et al [14].

Socio-demographics and anthropometric variables itself may not have a major influence on the prevalence of hypertension in our population in comparison to dietary pattern and other risk factors, similar results obtained by Nilofer, et al [15]

Some studies reported that fruit and vegetable intake has been shown to reduce blood pressure in randomized and prospective population [16].

The association between BMI and blood pressure is well established with several studies reporting higher likelihood of elevated BP among overweight and obese individuals; also BMI was a significant independent predictor of isolated systolic hypertension [17–18].

The frequency of consuming food from various food groups was also found to be a contributory factor to having either an isolated elevated SBP or both elevated SBP and DBP.

In our study fast food consumption per week and preference of fast food of healthy food (p were significantly associated with hypertension ($p<0.05$), in agreement with the Colecraf, et al [19] and K. Miura, et al [20].

We did not find any significant associations between the dietary pattern and obesity, this may be due to our population consist of younger age and a higher level of physical activity, concordance finding also reported by G. Roman, et al [21].

In this study no significant association was found between blood pressure and types of diet, father's or mother's occupation, gender and waist hip ratio, our results correlate with the Chen M, et al [22] and Sukhato K, et al [23].

Present study observed the prevalence of obesity is more in adolescents who eat fast food most of the times and underweight was more common in adolescents who eat fast food sometimes, comparable with the Yuri Han, et al [24].

Obesity is not only a chronic condition, but also an important biological risk factor for non-communicable diseases. Diet has been widely identified as a factor in the prevention of obesity [25].

There is no significant gender wise difference between Hypertension and obesity was found in current study, whereas a study conducted by Anyanwu, et al [26], reported that Hypertension and obesity was significantly higher among female than male.

In this study, prudent dietary pattern characterized by higher intake of fruits, whole grains products, dairy products, eggs, and wheat and its products, and lower intakes of rice and its products was associated with lower SBP and DBP among adolescent. This association was partially explained by body composition.

Conclusion

The prevalence of obesity and hypertension was more common in adolescent male compared to adolescent female. Obesity and hypertension was more in adolescents who eat fast food most of the times. Assessment of socio-demographics and dietary patterns in adolescent is helpful for prevention of chronic metabolic diseases like, obesity, diabetes mellitus and hypertension

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