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SOCIODEMOGRAPHIC FEATURES AND DIETARY PATTERNS ASSOCIATED WITH OBESITY AND HYPERTENSION AMONG ADOLESCENTS: A CROSS-SECTIONAL STUDY

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ABSTRACT

Background: Sociodemographic characteristics and dietary habits are important modifiable risk factors for obesity and hypertension among adolescents. Increased consumption of fast food is associated with a higher risk of obesity and elevated blood pressure.

Aim: To evaluate the socio-demographic characteristics and dietary patterns among adolescents and determine their association with obesity and hypertension**.**

Methods: This cross-sectional study was conducted in a tertiary care medical college in Central India using a predesigned questionnaire-based interview. A total of 350 school-going adolescents were selected randomly from various higher secondary schools. Anthropometric parameters including weight, height, waist circumference, waist–hip ratio, body mass index (BMI), blood pressure, and random blood sugar were recorded.

Results: The prevalence of hypertension and obesity was 20.8% and 4.5%, respectively. Dietary habits, gender, and mother's occupation showed no significant association with obesity, whereas father's occupation and body weight showed significant association with overweight/obesity. Fast-food consumption and preference for fast food over healthy food were significantly associated with hypertension.

Conclusion: Dietary modification and lifestyle interventions may help in the prevention and management of obesity and hypertension among adolescents.

Keywords: Dietary pattern, obesity, hypertension, adolescents, Sociodemographic factors

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.

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The nutrition transition has accompanied a rise in the prevalence of overweight and obesity in India [1]. 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) [2, 3]. 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 [4]. 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 [5]. 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 [6]. Accumulating evidence has suggested that diet plays a significant role in the development and progression of hypertension [7, 8]. 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 [9].

AIM OF THE STUDY

To evaluate the socio-demographic characteristics and dietary patterns among adolescents and to determine their association with obesity and hypertension

MATERIALS AND METHODS

This cross-sectional observational study was conducted in the Department of General Medicine at a tertiary care teaching hospital in India. A total of 350 school-going adolescents aged 9–16 years were recruited randomly from government, public, and central government higher secondary schools using a structured questionnaire-based survey. Written informed consent was obtained from parents/guardians, and assent was taken from participating students.

Data collection was performed on school premises in the presence of teachers and investigators. Sociodemographic details and dietary patterns were recorded using a

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predesigned questionnaire. Anthropometric parameters including height, weight, waist circumference, waist–hip ratio (WHR), and body mass index (BMI) were measured using standard techniques. Blood pressure was recorded using an appropriate-sized cuff, and random blood sugar levels were assessed.

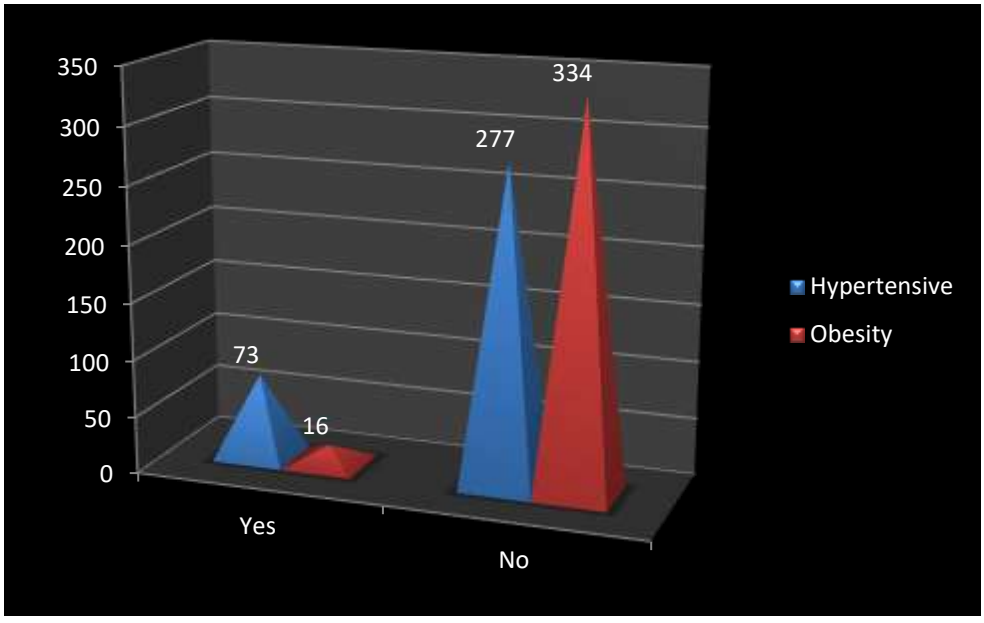
Adolescents of either gender whose parents provided consent were included in the study. Students with known psychiatric illness, chronic kidney disease, cardiac disease, or tuberculosis were excluded. Blood pressure classification was done according to age-, sex-, and height-specific percentiles. Hypertension was defined as blood pressure ≥95th percentile for age, sex, and height or ≥130/80 mmHg in adolescents aged ≥13 years. BMI categories were classified according to standard percentile-based criteria for underweight, normal weight, overweight, and obesity.

Statistical analysis: Statistical analysis was performed using IBM SPSS Statistics version 25.0. Data were expressed as mean ± standard deviation or percentages. Student's t-test, chi-square test, and ANOVA were applied where appropriate. A p-value <0.05 was considered statistically significant.

RESULTS

A total of 350 school-going adolescents were enrolled in the study. The prevalence of hypertension and overweight/obesity was 20.8% (73/350) and 4.5% (16/350), respectively.

Graph 1: Distribution of adolescents on the basis of blood pressure and obesity



The mean systolic blood pressure was 109.20±16.12 mmHg, while the mean diastolic blood pressure was 66.90±13.98 mmHg. The mean systolic and diastolic

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blood pressure percentiles were 59.73±31.52 and 60.87±28.45, respectively.

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

Dietary habits (vegetarian/non-vegetarian diet, frequency of fast-food consumption, and food preference), gender, and mother's occupation were not significantly associated with overweight or obesity. However, father's occupation showed a statistically significant association with overweight/obesity (p = 0.048) [Table: 2].

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

		Normal weight	Overweight	Obesity	Under weight	P value
Diet	Vegetarian	122(61.3%)	5(2.5%)	4 (2.0%)	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(0.7%)	4 (3%)	60 (44%)	
	Semiskilled Worker	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 FoodVs	Never	10(83.3%)	0(0%)	0(0%)	2(16.7%)	0.590
	Sometimes	112(54.6%)	6(2.9%)	6(2.9%)	81(39.5%)	

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Healthy Food Choose	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 preference for fast food over healthy food were significantly associated with hypertension ($p < 0.001$). Adolescents consuming fast food most frequently had a higher prevalence of hypertension compared to those consuming fast food occasionally or never. No significant association was observed between hypertension and other socio-demographic variables such as gender, parental occupation, type of diet, or waist–hip ratio [Table: 3].

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%)	
	Semiskilled Worker	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%)	
Preferenceof fast Food over Healthy	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%)	

ISSN: 0975-3583,0976-2833 VOL 12, ISSUE 10, 2021

Food	Always	3 (15.8%)	16 (84.2%)	
Waist hip Ratio		0.85 ± 0.12	0.85 ± 0.08	0.821

DISCUSSION

Dietary patterns are considered important determinants of adolescent health and may influence the development of non-communicable diseases such as obesity and hypertension. The prevalence of hypertension observed in the present study was 20.8%, which is comparable to findings reported by Yin et al [10] and Wang et al [11]., who documented an increasing burden of adolescent hypertension associated with lifestyle and dietary transitions. Similarly, the prevalence of obesity in the current study was relatively low, consistent with the observations of Pimenta et al [12].

In the present study, fast-food consumption and preference for fast food over healthy food were significantly associated with hypertension. Adolescents who consumed fast food more frequently showed a higher prevalence of elevated blood pressure. These findings are supported by studies conducted by Colecraft et al [13] and Miura et al [14], which demonstrated that unhealthy dietary practices, particularly increased intake of processed and high-salt foods, contribute to hypertension.

No significant association was observed between dietary patterns and obesity in the current study. This may be attributed to the younger age group and relatively higher physical activity levels among the participants. Similar findings were reported by Roman et al [15], who also observed no direct relationship between dietary patterns and obesity in adolescents.

The present study did not demonstrate a significant association between hypertension and factors such as gender, parental occupation, type of diet, or waist–hip ratio. Comparable findings have been reported by Chen et al [16] and Sukhato et al [17]. However, father's occupation showed a significant association with overweight and obesity, suggesting that socioeconomic status may influence nutritional habits and body composition among adolescents.

Although obesity prevalence was comparatively lower, adolescents with frequent fast-food consumption demonstrated higher rates of overweight and obesity. This observation is in agreement with the findings of Han et al [18], who reported an association between unhealthy dietary habits and increased cardiometabolic risk among adolescents.

CONCLUSION

ISSN: 0975-3583,0976-2833 VOL 12, ISSUE 10, 2021

The study demonstrates a notable prevalence of hypertension and obesity among adolescents. Frequent fast-food consumption and unhealthy dietary preferences were significantly associated with hypertension, highlighting the impact of dietary habits on adolescent health. Early dietary and lifestyle interventions may help prevent future cardiometabolic disorders, including obesity and hypertension, among adolescents.

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