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Burden Of Overweight and Obesity among Hypertensive Young Adults Attending a Tertiary Care Centre in Belagavi, Karnataka – A Cross-Sectional Study

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KEYWORDS

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ABSTRACT:

Introduction: Hypertension is a major public health concern in India and is closely linked with obesity and lifestyle-related factors. Emerging evidence indicates a rising prevalence of hypertension among young adults, largely driven by modifiable risk factors such as unhealthy diet and physical inactivity.

Objectives: To assess the burden of overweight and obesity among hypertensive young adults attending a tertiary care centre in Belagavi.

Methods: A cross-sectional study was conducted among 153 hypertensive individuals aged 20–50 years attending the Medicine Outpatient Department. Data were collected using a structured questionnaire. Anthropometric measurements, including body mass index (BMI), waist circumference, and waist–hip ratio, were recorded. Statistical analysis was performed using SPSS version 29.0. The Chi-square test and logistic regression were applied, with a p-value < 0.05 considered statistically significant.

Results: The mean age of participants was 35.92 ± 8.77 years. A high prevalence of obesity was observed, with 40.5% and 22.9% of participants classified under Obese I and Obese II categories, respectively. A non-vegetarian diet was predominant among participants. However, no statistically significant association was found between BMI and dietary pattern ($p = 0.853$) or meal-skipping behaviour ($p = 0.311$).

Conclusions: The findings indicate a high burden of overweight and obesity among hypertensive young adults. Early screening, along with targeted lifestyle and dietary interventions, is essential to reduce associated health risks and prevent long-term complications.

1. Introduction

Hypertension is increasingly recognized as a significant public health problem in India, including rural regions, due to its high prevalence and strong association with cardiovascular morbidity and mortality. [1] It is one of the most common cardiovascular disorders and plays a major role in the development of conditions such as coronary heart disease, stroke, and other vascular complications.[2] In Karnataka, the burden of hypertension among adults has been reported to be considerable, reflecting a growing public health challenge.[3]

The significance of this issue is further highlighted by evidence indicating that hypertension is a leading contributor to preventable deaths and disease burden in India. [3] Several factors, including advancing age, obesity, and the presence of diabetes, have been identified as important contributors to its development. Moreover, the rising prevalence of hypertension is linked to ongoing epidemiological and lifestyle transitions, including population ageing, urbanization, unhealthy dietary practices, and increased alcohol consumption.[2]

Despite extensive research, most existing studies have primarily focused on older populations, with relatively limited data available on young adults, who are often perceived to be at lower risk. [4] However, recent findings indicate a notable prevalence of hypertension even among individuals aged 20–40 years, suggesting an earlier onset of cardiovascular risk. In addition, modifiable factors such as body mass index (BMI) have been shown to have a significant association with hypertension.[4]

In view of the increasing burden of hypertension and its close relationship with obesity and lifestyle factors among young adults in Karnataka, it is important to assess the magnitude of

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overweight and obesity in this population. Therefore, the present study aims to evaluate the prevalence of overweight and obesity among hypertensive young adults attending a tertiary care centre in Belagavi, Karnataka.

2. Objectives

- To evaluate the prevalence of overweight and obesity among hypertensive young adults
- To assess anthropometric indicators such as BMI and central obesity
- To examine the association between BMI and dietary pattern
- To assess the relationship between BMI and meal-skipping behaviour

3. Methods

- **Study Design:** A cross-sectional study.
- **Study Setting and Source of Data:** The study was conducted in the Outpatient Department (OPD) of Medicine at KLE's Dr. Prabhakar Kore Hospital and Medical Research Centre, Belagavi.
- **Study Duration:** The data collection was carried out from 1st June 2025 to 31st March 2026.
- **Study Population:** The study population comprised young adults aged 20–50 years diagnosed with hypertension attending the Medicine OPD during the study period.
- **Sample Size:** The sample size was calculated using the formula: $n = \frac{Z^2 \times p \times q}{d^2}$
- Where Z = 1.96, p = 0.48, q = 1 – p, and e = 5% of p. [5] The calculated sample size was 145.
- After accounting for 5% attrition, the final sample size was 153.
- **Sampling Technique:** Purposive sampling technique was used.
- **Inclusion Criteria:** Young adults aged 20–50 years diagnosed with hypertension and attending the Medicine OPD at KLE Hospital were included in the study.
- **Exclusion Criteria:** Pregnant and lactating women, and individuals with acute or chronic illnesses affecting nutritional status or blood pressure, such as recent surgery or severe infections, were excluded.
- **Data Collection Procedure:** Ethical clearance was obtained from the Institutional Ethics Committee (IEC), JNMC, KAHER. After obtaining permission, data were collected using a structured questionnaire. Participants fulfilling the inclusion criteria and providing informed consent were enrolled. The purpose of the study was explained in the vernacular language, and each interview lasted approximately 20–25 minutes. Confidentiality of the participants was strictly maintained.
- **Anthropometric Measurements:** Height was measured using a stadiometer, weight using a calibrated weighing scale, and Body Mass Index (BMI) was calculated as weight (kg)/height (m^2). Waist circumference was measured using a non-stretchable measuring tape following standard procedures.
- **Statistical Analysis:** Data were entered in Microsoft Excel and analysed using Statistical Package for the Social Sciences (SPSS) version 29.0. Descriptive statistics such as mean, standard deviation, frequency, and percentage were used. Inferential statistics including Chi-square test and binary logistic regression analysis were applied. The strength of association was expressed using odds ratio (OR) with 95% confidence interval (CI), and a p-value < 0.05 was considered statistically significant.
- **Study Variables:** The study variables included dependent variables such as hypertension status and nutritional status (BMI), and independent variables including socio-demographic factors, anthropometric measurements, dietary factors, lifestyle factors, and clinical variables.
- **Ethical Considerations:** Ethical clearance was obtained from the Institutional Ethics Committee prior to the study, and informed consent was obtained from all participants before data collection.

4. Results

Table 1: Sociodemographic Profile of Participants (n = 153)

Age (years): 35.92 ± 8.77

Variable	Minimum	Maximum	Mean	Std. Deviation
Age	20	50	35.92	8.779

Variable	Category	Frequency (n)	Percentage (%)
Gender	Male	71	46.4
	Female	82	53.6
Marital Status	Married	112	73.2
	Unmarried	35	22.9
	Divorced/Widowed	6	3.9
Education	Illiterate	25	16.3
	Primary	33	21.6
	Secondary	33	21.6
	Graduate	37	24.2
	Postgraduate	25	16.3
Occupation	Student	30	19.6
	Housewife	51	33.3
	Private job	36	23.5
	Government job	10	6.5
	Business	21	13.7
	Farming	5	3.3
Religion	Hindu	79	51.6
	Muslim	61	39.9
	Christain	13	8.5
Nature of Family	Joint	41	26.8
	Nuclear	68	44.4
	Extended	44	28.8
Size of Family	Small (1–4)	66	43.1
	Medium (5–7)	42	27.5
	Large (>7)	45	29.4
Income	≥9130	50	33.6
	4565–9129	19	12.8
	2739–4564	1	.7
	Do not earn	79	53.0

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Table 1 shows that the mean age of the participants was 35.92 ± 8.77 years. Females constituted a slightly higher proportion (53.6%) compared to males (46.4%). The majority of participants were married (73.2%) and belonged to nuclear families (44.4%). A large proportion were housewives (33.3%), and more than half of the participants were non-earning (53.0%).

Table 2 : Anthropometric Measurements of Participants (n = 153)

Variable	Minimum	Maximum	Mean	Std. Devi
Height	148	185	162.84	9.151
Weight	43	109	71.91	14.08
Body Mass Index (BMI)	1	5	3.61	1.137
Waist Circumference (cm)	36	120	91.44	13.17
Hip Circumference (cm)	38	132	104.48	14.56
Waist-Hip Ratio (WHR)	1	2	1.01	.081

Table 2 presents the anthropometric characteristics of the study participants. The mean height was 162.84 ±9.15 cm, and the mean body weight was 71.91 ± 14.09 kg, indicating variability in body size across the study population. BMI was analysed using coded categories; hence mean value represents category scores, suggesting a shift towards higher BMI categories among participants. Regarding central obesity measures, the mean waist circumference was 91.44 ± 13.17 cm and the mean hip circumference was 104.48 ± 14.57 cm. The mean waist-to-hip ratio (WHR) was 1.01 ± 0.08, indicating increased central fat accumulation among the participants.

Table 3: Distribution of BMI Categories among Participants (n = 153)

Variable	Frequency (n)	Percentage (%)
Underweight	6	3.9
Normal	27	17.6
Overweight	23	15.0
Obese I	62	40.5
Obese II	35	22.9

Table 3 shows the distribution of Body Mass Index (BMI) categories among the participants. A very small proportion were underweighted (3.9%), while 17.6% had a normal BMI. Around 15.0% of participants were classified as overweight. However, most participants belonged to the obese categories, with 40.5% in Obese I and 22.9% in Obese II. Overall, the results indicate a high prevalence of overweight and obesity among hypertensive young adults.

Table 4: Association between BMI and Dietary Pattern (n = 153)

BMI Category	Vegetarian n (%)	Non-vegetarian n (%)	Ovolacto n (%)	Total	p-value
Underweight	1 (16.7)	5 (83.3)	0 (0.0)	6	
Normal	9 (33.3)	17 (63.0)	1 (3.7)	27	
Overweight	10 (43.5)	13 (56.5)	0 (0.0)	23	
Obese I	19 (30.6)	41 (66.1)	2 (3.2)	62	
Obese II	15 (42.9)	19 (54.3)	1 (2.9)	35	
Total	**54 (35.3)**	**95 (62.1)**	**4 (2.6)**	**153**	**0.853**

Table 4 shows the association between Body Mass Index (BMI) and dietary pattern, indicating that a non- vegetarian diet was predominant across all BMI categories. Among underweight participants, 83.3% followed a non-vegetarian diet, while the proportion was 63.0% among those with normal BMI. Similarly, 56.5% of overweight, 66.1% of obese I, and 54.3% of obese II participants were non-vegetarian. Vegetarian dietary patterns were also present across all BMI groups, with relatively higher proportions observed among overweight (43.5%) and obese II (42.9%) individuals. The ovolactovegetarian diet was minimally represented in all categories. However, the chi-square test indicated no statistically significant association between BMI and dietary pattern (p = 0.853). Overall, the results suggest that although non-vegetarian diet was most common, dietary pattern was not significantly associated with BMI in this study population.

Table 5: Association between BMI and Meal Skipping (n = 153)

BMI Category	Yes n (%)	No n (%)	Don't know n (%)	Total	p-value
Underweight	2 (33.3)	4 (66.7)	0 (0.0)	6	
Normal	8 (29.6)	15 (55.6)	4 (14.8)	27	
Overweight	7 (30.4)	9 (39.1)	7 (30.4)	23	
Obese I	25 (40.3)	23 (37.1)	14 (22.6)	62	
Obese II	10 (28.6)	12 (34.3)	13 (37.1)	35	
Total	**52 (34.0)**	**63 (41.2)**	**38 (24.8)**	**153**	**0.311**

Table 5 presents the association between Body Mass Index (BMI) and meal-skipping behavior, showing differences across BMI categories. Among underweight participants, 33.3% reported skipping meals, while 66.7% did not skip meals. In the normal BMI group, 29.6% reported skipping meals, 55.6% did not skip meals, and 14.8% were uncertain about their behavior. Among overweight individuals, 30.4% reported skipping meals, an equal 30.4% were uncertain, and 39.1% did not skip meals. In the obese I category, a higher proportion (40.3%) reported skipping meals compared to those who did not (37.1%). In the obese II group, 28.6% skipped meals, while 37.1% were uncertain about their meal-skipping habits. However, the chi-square test showed no statistically significant association between BMI and meal-skipping behavior (p = 0.311). Overall, the findings indicate that although meal-skipping patterns varied across BMI categories, there was no significant relationship between BMI and meal-skipping behavior in this study.

5. Discussion

Sociodemographic Characteristics (Table 1)

In the present study, the mean age of participants was 35.92 ± 8.77 years, with a slight predominance of females (53.6%). The majority of participants were married and non-earning. These findings are consistent with earlier studies. Singh et al. reported that hypertension is more frequently observed among middle-aged females in community settings.[6]Similarly a higher prevalence of hypertension among females and married individuals, suggesting that sociodemographic factors may influence disease occurrence.[7]

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Anthropometric Profile (Table 2)

The present study demonstrated elevated mean BMI along with increased central obesity indicators such as waist circumference and waist–hip ratio, indicating higher fat accumulation among participants. Comparable findings were reported, who identified central obesity as a significant factor associated with hypertension.[8] In addition, reports from the World Health Organization emphasize that excess body weight is a major contributing factor to the development of hypertension. [9]

BMI Categories (Table 3)

A high prevalence of obesity was observed in the present study, with a majority of participants classified under Obese I (40.5%) and Obese II (22.9%). These findings are in agreement with reports from ICMR, which indicate a rapidly increasing prevalence of overweight and obesity among Indian adults.[10] Similarly it has documented a substantial global rise in obesity over recent decades, highlighting its growing public health impact.[11]

BMI and Dietary Pattern (Table 4)

The analysis of BMI in relation to dietary pattern showed that a non-vegetarian diet was predominant across all BMI categories; however, no statistically significant association was observed ($p = 0.853$). Similar observations were reported by Satija et al., who noted that dietary type alone may not have a direct relationship with obesity.[12]Furthermore, it also emphasized that overall diet quality, rather than specific dietary patterns, plays a more important role in determining cardiometabolic risk. [13]

BMI and Meal-Skipping Behavior (Table 5)

In the present study, meal-skipping behavior varied across BMI categories, but no significant association was identified ($p = 0.311$). These findings are reported that while irregular eating patterns are linked with metabolic risk, their direct association with BMI may not always be evident.[14]Similarly, it has found that inconsistent relationships between meal frequency, skipping behavior, and body weight outcomes.[15]

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