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RESEARCH ARTICLE

PREVALENCE OF PRE HYPERTENSION AMONG THE ADULTS AGED 20-60 YEARS IN COASTAL AND NON COASTAL AREAS

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ABSTRACT

A cross sectional community based study was conducted in 10 coastal and 10 non coastal areas to assess the prevalence of pre hypertension in Nellore district. A total of 5000 samples were included in this study. Among this, 2500 samples belongs to coastal areas and 2500 samples belongs to non coastal areas. In coastal areas, among 2500 samples, with regard to pre hypertension, 1129 (45.16%) samples are with SBP pre hypertension and 78(3.12%) samples are with DBP prehypertension. In non coastal areas, among 2500 samples, with regard to pre hypertension, 971 (38.84%) samples are with SBP pre hypertension and 72 (2.88%) samples are with DBP prehypertension. The correlation coefficient value is highly significant (1) and the standard deviation is 566.60. The above results shown that pre hypertension values are higher in the coastal areas than in the non coastal areas. The variables like age, education, type of family, occupation, income, working members in the family, type of ventilation, sleeping hours, sleeping pattern, exercises, type of oil used, amount of oil used per day per person, type of salt, entertainment, stress, obesity are the influencing risk factors for the development of hypertension among the adults.

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INTRODUCTION

Prehypertension, defined as blood pressure between 120–139/80–89 mmHg, is a major public health concern. The condition is very prevalent (30% of the adult population), is often associated with other cardiovascular risk factors and independently increases the risk of hypertension and subsequent cardiovascular events. The mechanism of elevated risk for cardiovascular events associated with prehypertension is presumed to be the same as that of hypertension. In the general population, prehypertension can be lowered by lifestyle modifications, but often not reliable. The Seventh Report of the Joint National Committee on Prevention, Detection, Evaluation, and Treatment of High Blood Pressure (JNC-7) recommendation for prehypertension management with optimal weight control (largely through diet and exercise) remains the mainstay, except for individuals with diabetes, chronic kidney disease, and perhaps known coronary artery disease, because of the short-term cost considerations and unproven long-term prognosis. (*Hypertens Res* 2008; 31: 1681–1686)

Hypertension is a major cause of cardiovascular disease (CVD). The excess risk of CVD may extend to those with prehypertension (blood pressure [BP] 120–139/80–89 mm Hg).⁽¹⁾ The risks were increased if BP was low, as in low-range prehypertension (120 to 129/ 80 to 84 mm Hg), and were

further increased with high-range prehypertension (130 to 139/85 to 89 mm Hg).^(2, 3)

Need for the Study

One in three adults worldwide has high blood pressure. Hypertension increases the risk of heart attack, stroke, kidney failure and much other associated co morbidity. Treating raised blood pressure and maintaining it below 140/90 mmHg is associated with a reduction in cardiovascular complication. The theme for World Health Day (WHD) 2013 is “high blood pressure”. The goal of WHD 2013 is to reduce heart attacks and strokes. Keeping in line with the WHO-Government of India, Country Cooperation Strategy, the WHO 2013 events in India are aimed at raising the awareness amongst national policymakers, program managers and other stakeholders on the need to strengthen the Indian health system to make it competent enough to respond to hypertension and related co morbidities⁽⁴⁾.

A cross sectional community based study was conducted in 10 coastal and 10 non coastal areas to assess the prevalence of hypertension in Nellore district. A total of 5000 samples were included in this study. Among this, 2500 samples belongs to coastal areas and 2500 samples belongs to non coastal areas. In coastal areas, with regard to blood pressure, 460

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(18.4%) samples were found to have stage-1 hypertension, 139 (5.56%) samples had high normal blood pressure, 648 (25.92%) samples were found to be normal, 656 (26.24%) had optimal blood pressure, 112 (4.48%) samples had stage –II hypertension, least samples 15(0.6%) belongs to stage-3 hypertension, 413(16.52%) had grade-1 systolic hypertension, and 57(2.28%) samples had grade-2 systolic hypertension. In non coastal areas, with regard to blood pressure, 1419 (56.7%) were found to have stage-1 hypertension, 637(25.5%) samples had high normal, 198 (8.0%) samples had stage –II hypertension, 161 (6.4%) samples were found to be normal, 67 (2.7%) had optimal, 18 (0.7%) samples under the criteria of stage –III hypertension, 6(0.2%) having grade-1 systolic hypertension, and 4(0.2%) samples having grade-2 systolic hypertension.⁽⁵⁾

Statement of the Problem

“A study to assess the prevalence of pre hypertension among the adults aged 20-60 years in coastal and non coastal areas at Nellore district.”

Objectives of the Study

- To assess the prevalence of prehypertension among adults of coastal and non coastal areas.
- To identify the risk factors of prehypertension among adults of coastal and non coastal areas.
- To compare the prevalence of prehypertension between coastal and non coastal areas.
- To find association between the prevalence of prehypertension with selected socio demographic variables.

Detailed Research Plan

Research Approach Quantitative Approach.

Research Design Descriptive design.

Research Setting

The study was conducted in selected coastal and non coastal areas at Nellore

- The study was conducted at two parts:
- coastal areas: out of 19 areas 10 areas are selected by lottery method.
- Non coastal areas: out of 22 areas 10 areas were selected by the lottery method.
- Coastal area means areas within 2km from mean low water mark (MLWM) or mean high water mark (MHWM).
- Non coastal area means areas far 2km from mean low water mark (MLWM) or mean high water mark (MHWM).
- Coastal areas like: Kotha koduru, Mypadu , Mahalakshmi puram, Pallepalem, Kudithi palem, Indukur pet, Varukavi padu, Koruturu, Legunta padu, Komarika.

- Non coastal areas: Papi reddy palem, Allipuram, Pallipadu, Mudivarthi, Kakupalem, Inamadugu, Kovur, Vidavaluru, Utukuru, and Vavilla.

Sampling Technique: Convenience sampling technique

Sample Size 5000 adults aged 20-60 yrs.

Sample Criteria

- Inclusion Criteria
- Adults of 20-60yrs of age.
- Exclusion Criteria
- Adults below 20yrs and above 60yrs and
- Adults with acute illness.

Tools for Data Collection

Section A It deals with demographic data including age, education, type of the family, occupation, monthly income, nature of the work, sleeping hours, exercise type & duration, food pattern, type & amount of oil used for cooking, type & amount of salt used, amount of vegetable used, habits & consumption of fast food, height, weight, BMI, stress, waist circumference, chest circumference, head circumference, mid arm circumference and known hypertensive or not.

Section B Staging of the blood pressure According to INDIAN HYPERTENSION GUIDELINES-III (IHG-III).

METHOD OF DATA COLLECTION

A total of 20 areas were selected. In that 10 areas are coastal areas and 10 areas are non coastal areas. Since the sampling was done during the day time, it was a household based study and questionnaires were administered to those in the household and the necessary information were collected to meet the objectives of the study. The medico social history and other required details were filled up in the Proforma. The following techniques were used as per the recommendations of INDIAN HYPERTENSION GUIDELINES-III (IHG-III).

Procedure for Recording B.P

- The individual is seated in a chair with his back supported and his arms bared and supported at heart level and was refrained from the use of tobacco in any form or ingestion of caffeine during the 30 minutes preceding the measurement.
- Palpate the brachial artery and position cuff 2.5 cm above brachial pulsation, wrap the cuff evenly around the upper arm and record both systolic and diastolic blood pressure.
- This procedure repeated for three days to the participants (Samples). In this the mean blood pressure reading is taken and classified according to INDIAN HYPERTENSION GUIDELINES-III (IHG-III).
- However the newly diagnosed hypertensive individuals were referred to the primary health center for further investigations and management. The known hypertensive cases were emphasized to continue their regular treatment.

Plan for Data Analysis

The data was analyzed by using Descriptive statistics and inferential statistics i.e. Mean, standard deviation, frequency, percentage, and Chi square test.

Among 2500 samples with regard to BMI Underweight 31 (2.74%), Normal 953 (84.41%), Overweight 111 (9.83%),

Table 1 Plan for data analysis

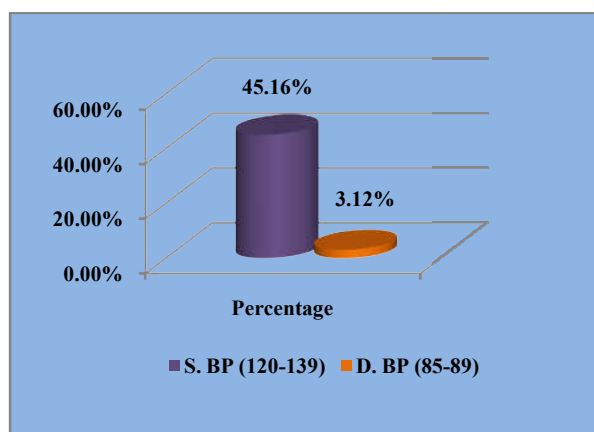
Data analysis	Methodology	Remarks
Descriptive statistics	Frequency, Percentage, Mean and standard deviation	To find out the frequency and percentage used for analyzing the demographic variables.
Inferential statistics	Chi-square Value	To find out the association between the selected demographic variables& the blood pressure and To find out the association between the Blood pressure and BMI.

Coastal Areas

The findings in the coastal areas described in the following headings.

Frequency And Percentage Distribution Of Prehypertention in Coastal Areas.**Table 2** Frequency And Percentage Distribution Of Prehypertention in Coastal Areas. N=2500

PREHYPERTENTION	Frequency	Percentage
S. BP (120-139)	1129	45.16%
D. BP (85-89)	78	3.12%

**Fig. 1** Prevalence of prehypertension in Coastal Areas

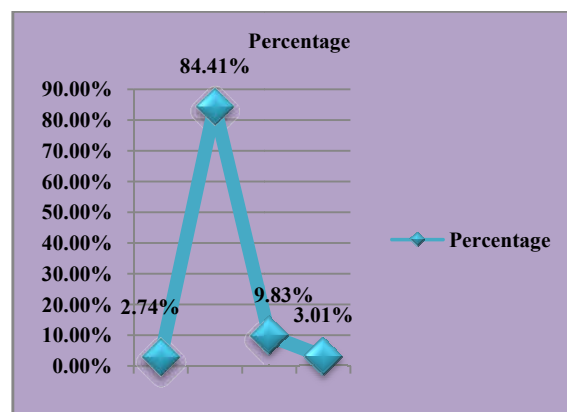
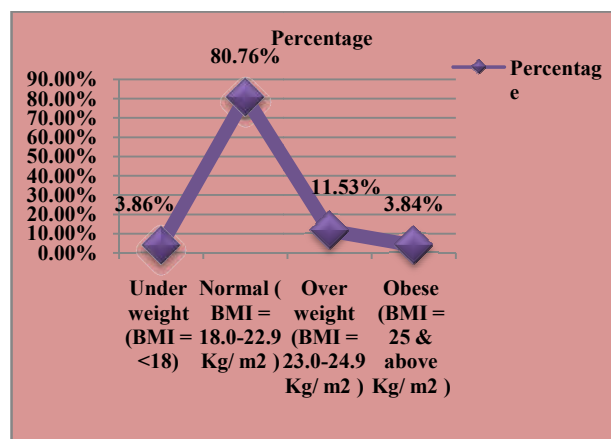
In coastal areas, among 2500 samples, with regard to pre hypertension, 1129 (45.16%) samples are with SBP pre hypertension and 78(3.12%) samples are with DBP prehypertension.

Frequency And Percentage Distribution Of Body Mass Index in Prehypertension Cases In S.BP.**Table 3** Frequency And Percentage Distribution Of Body Mass Index in Prehypertension Cases In S.BP. N=1129

CRITERIA	Frequency	Percentage
Under weight (BMI = <18)	31	2.74%
Normal (BMI = 18.0-22.9 Kg/ m ²)	953	84.41%
Over weight (BMI = 23.0-24.9 Kg/ m ²)	111	9.83%
Obese (BMI = 25 & above Kg/ m ²)	34	3.01%

Table 4 The Frequency and Percentage Distribution of Body Mass Index in PREHYPERTENSION CASES in D.BP. N=78

CRITERIA	Frequency	Percentage
Under weight (BMI = <18)	3	3.86%
Normal (BMI = 18.0-22.9 Kg/ m ²)	63	80.76%
Over weight (BMI = 23.0-24.9 Kg/ m ²)	9	11.53%
Obese (BMI = 25 & above Kg/ m ²)	3	3.84%

**Fig. 2** Percentage Distribution Of Body Mass Index in Prehypertension Cases in S.BP.**Fig 3** Percentage Distribution Of Body Mass Index in Prehypertension Cases in D.BP.

Among 2500 samples with regard to BMI Underweight 3 (3.86%), Normal 63 (80.76%), Overweight 9 (11.53%), Obese 3 (3.84%).

Association of Demographic variables with BP in the coastal areas

Among 2500 samples with regard to blood pressure age, education, family, occupation, income working members in the family, Type of ventilation, sleeping hours, sleeping pattern, exercises, Type of oil used, Amount of oil used per day per person, Type of salt, Entertainment, Intake of fish, stress, Known hypertension are significant, and remaining were non significant.

Association of BMI group with prehypertension in coastal areas

With regard to Association of BMI group with BP, BMI group

is having significant association with BP

Non coastal areas

The findings in the non coastal areas described in the following headings

Frequency And Percentage Distribution Of Prehypertension in Non Coastal Areas

Table 5 Frequency and Percentage Distribution Of Prehypertension in Non Coastal Areas N=2500

PREHYPERTENSION	Frequency	Percentage
S. BP (120-139)	971	38.84%
D. BP (85-89)	72	2.88%

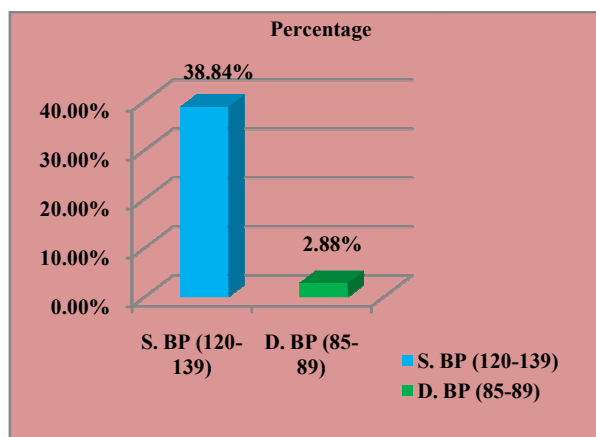


Fig. 4 Prevalence of prehypertension in Non Coastal Areas

In non coastal areas, among 2500 samples, with regard to pre hypertension, 971 (38.84%) samples are with SBP pre hypertension and 72 (2.88%) samples are with DBP prehypertension.

Table 6 The Frequency and Percentage Distribution of Body Mass Index in PREHYPERTENSION CASES in S.BP. N=971

CRITERIA	Frequency	Percentage
Under weight (BMI = <18)	65	6.69%
Normal (BMI = 18.0-22.9 Kg/ m ²)	741	76.31%
Over weight (BMI = 23.0-24.9 Kg/ m ²)	116	11.94%
Obese (BMI = 25 & above Kg/ m ²)	49	5.04%

Table 7 The Frequency and Percentage Distribution of Body Mass Index in prehypertension cases in D.BP. N=72

CRITERIA	Frequency	Percentage
Under weight (BMI = <18)	3	4.16%
Normal (BMI = 18.0-22.9 Kg/ m ²)	58	80.55%
Over weight (BMI = 23.0-24.9 Kg/ m ²)	8	11.11%
Obese (BMI = 25 & above Kg/ m ²)	3	4.16%

Table 8 Comparison of Pre HTN in S.BP and D.BP in Coastal and non coastal areas N=2500

Pre HTN Blood Pressure Category	Coastal		Non Coastal		Correlation coefficient	Standard deviation
	Frequency	Percentage	Frequency	Percentage		
S. BP (120-139)	1129	45.16%	971	38.84%	1	566.60
D. BP (85-89)	78	3.12%	72	2.88%		

Among 2500 samples with regard to BMI Underweight 65 (6.69%), Normal 741 (76.31%), Overweight 116 (11.94%), Obese 49 (5.04%).

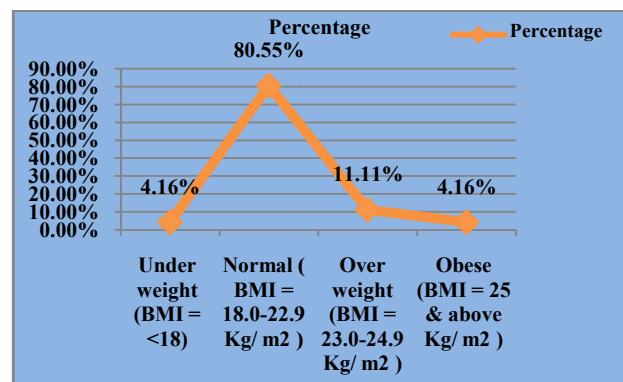


Fig 6 Percentage Distribution Of Body Mass Index in Prehypertension Cases in S.BP.

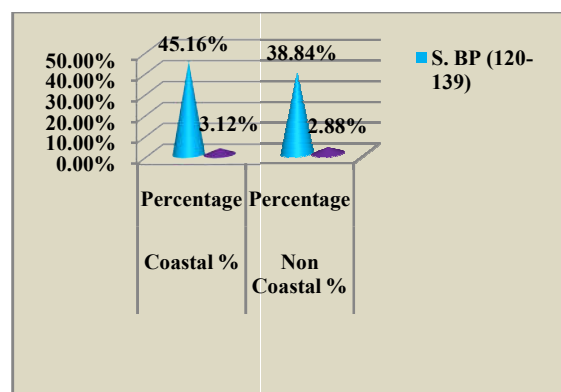


Fig 7 Comparison of Pre HTN in S.BP and D.BP in Coastal and non coastal areas

Among 2500 samples with regard to BMI Underweight 3 (4.16%), Normal 58 (80.55%), Overweight 8 (11.11%), Obese 3 (4.16%).

Association of Demographic variables with BP in the Non coastal area

Among 2500 samples with regard to BP: age, gender, education, occupation, working members in the family, food pattern, entertainment, Intake of fish, stress, Known hypertensive were significant remaining were non-significant.

Association of BMI group with BP in the non coastal areas

Among 2500 samples BMI group is having significant association with BP.

Comparison of Pre HTN in S.BP and D.BP in Coastal and non coastal areas

The prevalence of prehypertension in coastal areas is greater than the prevalence of prehypertension in the coastal areas. The correlation coefficient is 1 with standard deviation of 566.60.

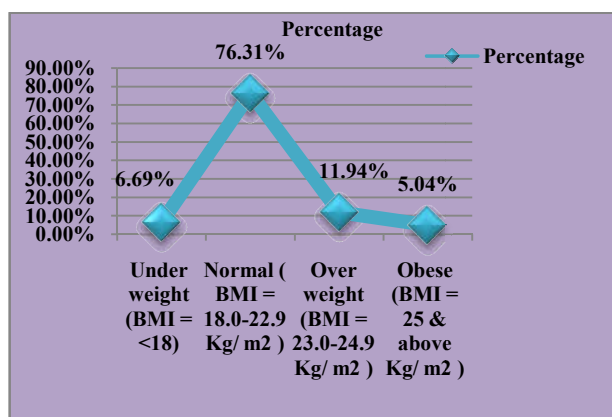


Fig. 5 Percentage Distribution Of Body Mass Index in Prehypertension Cases in S.BP.

CONCLUSION

The above results shown that prehypertension is high in the coastal areas than in the non coastal areas. The variables like age, education, type of family, occupation, income, working members in the family, Type of ventilation, sleeping hours, sleeping pattern, exercises, Type of oil used, Amount of oil used per day, Type of salt, Entertainment, stress, obesity are the influencing risk factors for the development of prehypertension among the adults.

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