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Correlation of sleep, exercise and food with hypertension in selected rural areas of Nellore: A cross sectional study

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Abstract

Background: Hypertension is a significant risk factor for cardiovascular disease (CVD). The majority of patients, however, cannot easily maintain a healthy blood pressure. Therefore, lifestyle modifications are important and may include getting enough sleep. The purpose of this study was to determine the relationship between sleep duration and hypertension.

Objective: The objective was to assess the sleep with hypertension among rural adults.

Methods: The participants in this cross-sectional study came from nine rural areas of Nellore. A total of 200 adults were randomly selected. Trained investigators administered a standard questionnaire to each participant during a face-to-face interview and carried out blood pressure monitoring.

Results: The results show that, out of 200 adults with regard to the category of the blood pressure 87 (43.50%) had optimal blood pressure, 60 (30.00%) had normal blood pressure, 39 (19.50%) had high normal blood pressure and 14(7.00%) had hypertension. The correlation coefficient value for sleep pattern and hypertension is 0.76 which states that there is a positive correlation between sleep pattern and hypertension. The correlation coefficient value for sleeping hours and hypertension is 0.36 which states that there is a positive correlation between sleeping hours and hypertension. The correlation coefficient value for exercise and hypertension is - 0.21 which states that there is a negative correlation between exercise and hypertension. The correlation coefficient value for amount of vegetables per day per person and hypertension is 0.68 which states that there is a positive correlation between amount of vegetables per day per person and hypertension. The correlation coefficient value for use of fast food and hypertension is -0.66 which states that there is a negative correlation between use of fast food and hypertension. The correlation coefficient value for hotel food and hypertension is - 0.79 which states that there is a negative correlation between hotel food and hypertension.

Conclusion: The hypertension is associated with the sleep pattern, use of fast food, and hotel food. but socioeconomic factors are also important.

Keywords: Adults, hypertension, sleep, exercise, food, Nellore

1. Introduction

Hypertension is a well-known risk factor of the cardiovascular system that increases the risk of cardiovascular disease and places serious burdens on society and the economy [1]. The previous research work shows a high prevalence of Hypertension in the Nellore population [2].

The most effective way to prevent hypertension-related mortality or morbidity is preventing and treating hypertension [3]. Although hypertension treatment methods have improved over the last few decades, there are still many patients that fail to reach their treatment goals. The research of Dr. Indira. A *et al.* [4]. Shows that Nellore people are no exception. Treating hypertension is difficult and complex; therefore, to reduce the risks of developing hypertension-related disease, it is important to make lifestyle changes such as adopting a low-salt diet, maintaining appropriate weight, drinking in moderation, exercising regularly, not smoking, and dietary therapy [5]. In addition, the patient's lifestyle should be reviewed for necessary modifications.

In terms of lifestyle, recent epidemiological studies suggest a minimum sleep duration to be obtained to maintain health. Research argues that short sleep duration is related to the prevalence of hypertension. Sleep deprivation significantly increases blood pressure in both control and hypertension groups [6]. Similarly, research suggests that an appropriate sleep duration can help to lower the prevalence of hypertension, cardiovascular-related mortality,

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obesity, and metabolic syndrome. If sleep duration is too short or too long, cardiovascular disease-related mortality increases [7]. Obtaining the proper amount of sleep may help prevent or treat hypertension.

The aim of the current study is to understand correlation between sleep pattern, sleeping hours, exercise, amount of vegetables per day per person, fast food and hotel food with hypertension.

2. Detailed Research Plan

2.1 Research Approach: Quantitative Approach.

2.2 Research Design: Descriptive design.

2.3 Research Setting: The study was conducted at Narayana medical college & hospital, Nellore.

2.4 Sampling Technique: Convenience sampling technique

2.5 Sample Size: A total of 200 samples were included in this study.

3. Results and Discussion

Table 1: Correlation between sleeping pattern and hypertension. (N=200)

Sleeping Pattern	F	%	Blood Pressure category	F	%	Pearson correlation
a. Without dream	78	39%	Optimal	87	43.50%	0.761353
b. With dream	74	37%	Normal	60	30.00%	
c. Disturbed for urination	13	6.50%	High Normal	39	19.50%	
d. Disturbed by other causes	35	17.50%	HTN	14	7.00%	

The above table shows the correlation between sleeping pattern and hypertension. The Pearson correlation coefficient is 0.76 which shows a positive correlation between sleeping pattern and hypertension.

The present study results are consistent with the findings of the previous studies conducted in Nellore region [8, 9].

Table 2: Correlation between sleeping hours and hypertension. (N=200)

Sleeping Hours	F	%	Blood Pressure category	F	%	Pearson correlation
a. < 6 hrs	30	15%	Optimal	87	43.50%	0.369578
b. 6 – 8 hrs	137	68.50%	Normal	60	30.00%	
c. 8 – 10 hrs	30	15%	High Normal	39	19.50%	
d. >10 hrs	3	1.50%	HTN	14	7.00%	

The above table shows the correlation between sleeping hours and hypertension. The Pearson correlation coefficient is 0.36 which shows a Positive correlation between sleeping hours and hypertension.

The present study results are consistent with the findings of the previous studies conducted in Nellore region [10, 11].

Table 3: Correlation between exercise and hypertension. (N=200)

Exercise	F	%	Blood Pressure category	F	%	Pearson correlation
a. Aerobic	13	6.50%	Optimal	87	43.50%	-0.21521
b. Anaerobic	12	6%	Normal	60	30.00%	
c. Walking	166	83.00%	High Normal	39	19.50%	
d. Yoga	9	4.50%	HTN	14	7.00%	

The above table shows the correlation between sleeping exercise and hypertension. The Pearson correlation coefficient is -0.21 which shows a negative correlation between exercise and hypertension.

The present study results are consistent with the findings of the previous studies conducted in Nellore region [12-16].

Table 4: Correlation between amount of vegetables per day per person and hypertension. (N=200)

Amount Of Vegetables Per Day Per Person	F	%	Blood Pressure category	F	%	Pearson correlation
a. 30 gm	57	28.50%	Optimal	87	43.50%	0.687958
b. 40 gm	96	48%	Normal	60	30.00%	
c. 50 gm	39	19.50%	High Normal	39	19.50%	
d. 60 gm	8	4%	HTN	14	7.00%	

The above table shows the correlation between sleeping hours and hypertension. The Pearson correlation coefficient is 0.68 which shows a Positive correlation between amount of vegetables per day per person and hypertension.

The present study results are consistent with the findings of the previous studies conducted in Nellore region [17-21].

Table 5: Correlation between use of fast food and hypertension. (N=200)

Use of fast food	F	%	Blood Pressure category	F	%	Pearson correlation
a. Daily	22	11%	Optimal	87	43.50%	-0.66573
b. Weekly	56	28%	Normal	60	30.00%	
c. Bi-weekly	13	6.50%	High Normal	39	19.50%	
d. Monthly	109	55%	HTN	14	7.00%	

The above table shows the correlation between sleeping hours and hypertension. The Pearson correlation coefficient is -0.66 which shows a negative correlation between use of fast food and hypertension.

Table 6: Correlation between hotel food and hypertension. (N=200)

Hotel Food	F	%	Blood Pressure category	F	%	Pearson correlation
a. Daily	15	8%	Optimal	87	43.50%	-0.79613
b. Weekly	25	13%	Normal	60	30.00%	
c. Bi-weekly	20	10.00%	High Normal	39	19.50%	
d. Monthly	140	70%	HTN	14	7.00%	

The above table shows the correlation between hotel food and hypertension. The Pearson correlation coefficient is -0.79 which shows a negative correlation between use of hotel food and hypertension.

The present study results are consistent with the findings of the previous studies conducted in Nellore region [27-31].

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