Original Research Paper　　　　　　　　**Nursing**

PREVALENCE OF HYPERTENSION AMONG WOMEN IN A SELECTED SUBURBAN AREA AT SOUTH INDIA: ACROSS SECTIONAL SURVEY

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ABSTRACT　**Background:** Hypertension is one of the major public health problems in the world. Many people are unaware about their hypertension especially in sub urban and rural areas .Very few studies have been done in this area. Hypertension is asymptomatic until it become severe and target organ disease has occurred.
Objective: The objective of this study was to determine the prevalence of hypertension among women in a sub urban area of Kerala.
Methods: A cross-sectional study was conducted from March 2019 – June 2019 in the self help goups of Thripunithura Municipaity of Ernakulam District in Kerala. 700 women aged 25years or more, were selected by convenient sampling. Socio personal information was collected using structured Performa and anthropometric measurements were recorded using standard guidelines.
Results: Among the 700 women in this study, the prevalence of HTN was 46.71% (327), among them 101 (30.88%) were previously diagnosed with HTN while 226(69.11%) were new cases detected in this study. The mean systolic BP was134.2mmHg with SD of 18.6 and diastolic BP was 84.9mm of Hg with SD of 9.23. The mean weight was 56.56 kg ± 10.59 and waist circumference was 90.03cm ± 11.28. A positive correlation was found between Blood pressure and selected demographic variables like age, monthly income, general obesity and central obesity, where as a negative correlation was observed with occupation and education.
Conclusions: In this study, the prevalence of hypertension was 48.77%. But it was alarming that the percentage of Pre-hypertension was increased to nearly half (46.71%) of the study population.

KEYWORDS : Hypertension, Prevalence, sub urban

1.INTRODUCTION

Lifestyle diseases are the emerging trend in the present scenario. It is not restricted to adults alone, lifestyle diseases have started affecting children as well. Advances in technology and improved socio economic conditions makes the people less physical active, more availability of resources and no time to spare. An elevated blood pressure is one of the most important public health problems in developing countries. It is usually asymptomatic in nature, easy to detect and treatable and often leads to lethal complications if untreated. Hypertension is called the silent killer because it often has no symptoms and is not discovered until a series of complications develops. As the blood pressure rises, so does the risk of cardiac arrest, heart failure, stroke, kidney diseases and blindness (Linton 2008).

Worldwide, raised blood pressure is estimated to cause 7.5 million deaths, about 12.8% of the total of all deaths. **An estimated 1.13 billion people worldwide have hypertension, most (two-thirds) living in low- and middle-income countries.** Globally, the overall prevalence of raised blood pressure in adults aged 25 and over was around 40% in 2008. Across the WHO regions, the prevalence of raised blood pressure was highest in Africa, where it was 46% for both sexes combined. Both men and women have high rates of raised blood pressure in the Africa region, with prevalence rates over 40%. The lowest prevalence of raised blood pressure was in the WHO Region of the Americas at 35% for both sexes. Men in this region had higher prevalence than women (39% for men and 32% for women) (WHO 2015).

The prevalence of hypertension was varying in different parts of India. Across sectional survey was conducted in six–twenty urban streets in different cities from five different corners of India, using similar methods of sample selection and criteria. There were 3212 randomly selected women from Moradabad (n=902), Trivandrum (n=760), Calcutta (n=365), Nagpur

(n=405) and Bombay (n=780), aged 25–64 years, The prevalence of hypertension (>140/90 mm Hg) was significantly (P<0.01) high in Trivandrum, South India (30.7%), and Bombay, West India (28.0%), compared to Moradabad, which is in northern India (22.6%), Nagpur, in central India (24.2%), and Calcutta, in east India (19.1%). Mean systolic and diastolic blood pressures were significantly higher in Trivandrum and Bombay compared to the other three cities. The overall prevalence of hypertension was 25.6% (n=823) and isolated diastolic hypertension was the most common form of hypertension (50.5%, n=1506) in the five Indian cities. The study showed that age (odds ratio 1.16), body mass index (1.68) and obesity were strongly associated with hypertension. A sedentary lifestyle and salt intake were weakly associated and alcohol intake was not a factor with these women (Dorairaj P, Yusuf S. 2010).

The disease burden attributable to hypertension increased from 21 million in 1990 to 39 million in 2016 (+89%). Social determinants of hypertension are important and Indian states with greater urbanization, human development and social development have more hypertension.(Rajeev Gupta, Kiran Kaur and Venkata S Ram 2019)

A Study of prevalence of hypertension in rural population of kerala shows that the overall prevalence of hypertension was 19.82%. Prevalence of hypertension increased with age but did not vary with sex. The prevalence of hypertension was strongly associated with body mass index (BMI). (Pawar Anant, Shinde Pradip, and Annie John 2012)

A review on Women and Hypertension: Beyond the 2017 Guideline for Prevention, Detection, Evaluation, and Management of High Blood Pressure in Adults explains that there is a vascular protective effect for estrogen in up-regulation of nitric oxide pathway & down regulation of sympathetic pathway, reticular activating system and

endothelin production. But after menopause change in estrogen levels reduces this protective effect. Pregnancy causes vascular risks such as pregnancy induced hypertension. States of estrogen imbalance such as polycystic ovarian disorder, premature ovarian insufficiency and infertility are also increases the risk for hypertension. Lower hypertension rates are found in premenopausal women, where as two-fold increase in risk of hypertension with menopause. (Beth L. Abramson, Kajenny Srivaratharajah, Leslie L. Davis,; Biljana Parapid, 2018).

Very few studies have been conducted about the prevalence of hypertension among women in semi urban and rural areas. It is necessary to explore the prevalence of the problem in these areas.

Objectives
1. To assess the prevalence of hypertension among women from selected municipality of Ernakulam district in Kerala
2. To find out the relationship between hypertension and selected demographic variable

2. Materials and methods
Study design
A cross-sectional survey design was adapted for the present study.

Study setting
This study was conducted in Thripunithura Community Development Society, the suburban area of Ernakulam District in Kerala.

Study period
Data was collected during a period of four months (March 2019 – June 2019).

Study subjects
Women aged more than 25 years who are the members of self help groups in Thripunithura Community Development Society.

Inclusion criteria
Women aged more than 25 years who are the members of self help group in Thripunithura Community Development Society and willing to participate in the study.

Exclusion criteria
Women reported with any other disease like cardiac disease, renal disease, cancer and neurovascular problems. Women who are pregnant, psychiatric disorders and severe cognitive impairment are also excluded from the study

Sampling and Sampling method
700 study participants were selected to find out the prevalence of hypertension. Participants were chosen by convenient sampling from 8 area development societies (ADS) of 36 ADS in Thripunithura Municipality.

Data collection tools
After obtaining permission from the authority, informed consent was taken from the participants. A detailed history was obtained by structured questionnaire. Anthropometric measurements such as height, weight, body mass index (BMI), waist circumference were assessed. Blood pressure was measured with a calibrated mercury sphygmomanometer. It was measured to the nearest 2 mm Hg .

Data analysis
Data was collected, coded and entered in Microsoft Excel sheet, re-checked. Entire data analysis was performed using R software (EZR version1.35).The relationship between demographic variables and hypertension was determined using Pearson correlation coefficient test.

Ethical considerations
Clearance was obtained from ethical committee of Saveetha Medical College Hospital. Permission was obtained from the State Kudumbashree Mission and Thripunithura Community Development Society. Informed consent was obtained study participants who are willing to participate in the study. Strict confidentiality was maintained so that the information obtained would not be used for purposes other than stated.

3.Results
Socio-demographic characteristics of the participants
There were 700 women of age range 25 to 65 years. Most of the study subjects (96.7%) were married. Educational status showed that 40% of them had secondary education. Among the 700 study participants, nearly half of them (47%) were unemployed and 30% had a monthly income of Rs10000 to 20000/month (Table 1). The mean body weight of the women was 56.56± 10.59 kg and waist circumference was 90.03 ± 11.28 cm.

Table 1. Distribution of participants according to demographic variable

(n=700)

SI NO	Demographic variables	Frequency	Percentage
	Age		
1	25-35	140	20
2	35-45	242	35
3	45-55	197	28
4	≥55	121	17
	Education		
1	Primary Education	127	18
2	Secondary Level	280	40
3	Higher secondary level	221	32
4	Graduation and above	72	10
	Occupation		
1	Unemployed	328	47
2	Unskilled worker	181	26
3	Skilled worker	167	24
4	Professional	24	3
	Income		
1	<6000/ month	93	13
2	6000-10000/month	231	33
3	10000-20000/month	275	39
4	20000-50000/month	101	15

Hypertension status
The present study shows that among 700 participants only 10.8% (76) had normal blood pressure(SBP<120 mm Hg and DBP<80 mm Hg). Nearly half (46.71%) of them were pre hypertensives (SBP: 120-139 mm Hg and DBP: 80-89 mm Hg) and 42.43% were hypertensives (SBP>140 mm Hg or DBP>90 mm Hg) (Table 2). Among the hypertensives, 101 (31%) were previously diagnosed with HTN while 226 (69%) were new cases detected in this study.

Figure1. Frequency distribution of participants based on Blood pressure status

(n=700)

Legend: SBP <120 and DBP<80 (76); SBP 120-139 or DBP 80-89 (327); SBP ≥140 or DBP ≥90 (297)
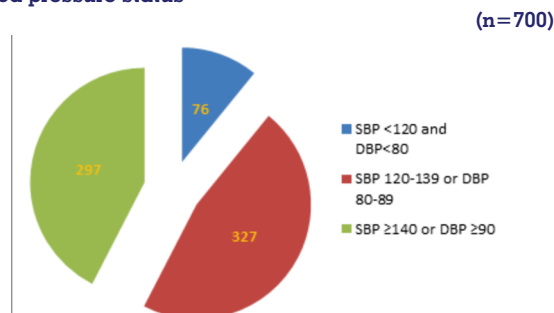
Systolic Blood Pressure

The present study shows that the mean systolic BP was134.2mm Hg ±18.6. Of the 700 study subjects, there were 99 women with normal systolic Blood pressure of less than 120mm Hg. Those with pre hypertension (120-139 mm Hg) constituted 268 (38%) of the participants, and 217 (31%) were grade 1 hypertensives (140-159 mm Hg) and 116(17%) had grade 2 hypertension (>160mm Hg) (Table 3).

Table 2: Frequency and percentage of Systolic Blood pressure

(n=700)

SI NO	Systolic Blood pressure (mm Hg)	Frequency	Percentage
1	<120(Normal)	99	14
2	120 – 139(Pre hypertension)	268	38
3	140-159(Grade1 Hypertension)	217	31
4	≥160 (Grade 2 Hypertension)	116	17

Diastolic pressure

Of the 700 study participants, there were 76 women with normal systolic Blood pressure of less than 80mm Hg. Those with pre hypertension (80-89 mm Hg) constituted 327 (47%) of the participants, and 188 (27%) were grade 1 hypertensive (90-99 mmHg) and 109 (15%) had grade 2 hypertension (≥100 mmHg). The mean diastolic BP was 84.9 mm Hg±9.23 (Table 4).

Table 3: Frequency and percentage of Diastolic Blood pressure

(n=700)

SI NO	Diastolic Blood pressure(mm Hg)	Frequency	Percentage
1	<80(Normal)	76	11
2	80 – 89 (Pre hypertension)	327	47
3	90 – 99 (Grade2 Hypertension)	188	27
4	≥100 (Grade1 Hypertension)	109	15

Relationship between hypertension and selected demographic variables

The prevalence of systolic and diastolic hypertension was found to increase with age, and this relation between HTN and age was found to be statistically significant (p = 0.001). There was an inverse relationship was found with education. It was found to be statistically significant (p = 0.001). There was a weak negative correlation was found between systolic and diastolic blood pressure and occupation(r=-0.118 and -0.07). It was found to be statistically significant (p = 0.001 and 0.05). There was a weak positive correlation was found between systolic and diastolic blood pressure and monthly income(r=0.168 and 0.169). It was found to be statistically significant (p = 0.001).

In this study, being overweight (BMI > 25 kg/ m2) and/ or obesity (BMI > 30 kg/m2) was positively correlated with hypertension (r=0.103 and 0.139) and this association was statistically significant (p=0.01 and 0.001). A weak positive correlation was observed between Waist circumference (WC) and HTN and it was found to be statistically significant (p =0.001).

4.DISCUSSION

In the current study there were 700 women of age range 25 to 65 years. Most of the study subjects (96.7%) were married. Educational status showed that 40% of them had secondary education. Among the 700 study participants, nearly half of them (47%) were un employed and 30% had a monthly income of Rs10000 to 20000/month. The mean weight of the women was 56.56± 10.59 kg and waist circumference was 90.03 ± 11.28 cm. A cross-sectional study on prevalence of hypertension and risk factors associated with hypertension among 200 people in a rural area of North Kerala found a differential findings that most of them were Hindus (97.5%),

99% were married, 58.5% were illiterate, 33.5% and 46% were housewives and farmers, respectively (Satheesh B C, Shankar K 2017).

The present study was conducted among the self help groups of Thripunithura municipality. The prevalence of hypertension was 42.43% (BP >140/ >90 mm Hg) among women in this study. This included both the newly detected hypertensives and previously diagnosed cases of hypertension. Pre hypertensives (BP =120-139/ 80-89 mm Hg) constituted 46.71% of the study population while the rest of the study subjects (10.86%) were normotensives (BP <120/ <80 mm Hg). The overall prevalence of hypertension in this study was high (42.43%) and the fact that those with pre hypertension constituted nearly half (46.71%) of the study population is an alarming trend. A similar cross-sectional study on prevalence of hypertension and risk factors associated with hypertension in a rural area of North Kerala shows that the overall prevalence of HTN was 21% and risk factors associated were male gender, aged ≥45 years, lack of exercise, obesity and high waist circumference. (Satheesh B. C, Mohammad Iliyas C 2017).

The present study shows that the mean systolic BP was134.2mm of Hg with a standard deviation of 18.6 and mean diastolic BP was 84.9mmof Hg with standard deviation 9.23.The findings of this study is higher compared to other similar studies. A study on Prevalence and risk factors of hypertension among women in a rural community of Maharashtra shows an overall prevalence of hypertension among women in rural area was 23.6%. 34.1% of participants had systolic blood pressure (BP) >140 than mmHg (isolated systolic hypertension) while 37.2% had diastolic BP >90 mmHg (isolated diastolic hypertension). The mean systolic BP calculated was 130 mmHg with SD 20.7 with 95% confidence interval (CI) of mean to be 127.5–132.8 mmHg, whereas diastolic BP was 83 mmHg with SD 11.1 with 95% CI of mean to be 81.7–84.6 mmHg (Maj Rekha Sharma, Ravikant Nair, Raj Kumar , Dashrath Basannar2018)

In this study the prevalence of systolic and diastolic hypertension was found to increase with age, and this relation between HTN and age was found to be statistically significant (p = 0.001). There was an inverse relationship was found between blood pressure and education. It was found to be statistically significant (p = 0.001). There was a weak negative correlation was found between systolic and diastolic blood pressure and occupation(r=-0.118 and -0.07). It was found to be statistically significant (p = 0.001 and 0.05). There was a weak positive correlation was found between systolic and diastolic blood pressure and monthly income(r=0.168 and 0.169). It was found to be statistically significant (p = 0.001). Considering the physical characteristics of the participants the generalized obesity and central obesity are significantly associated with hypertension. In this study, being overweight (BMI > 25 kg/ m2) and/ or obesity (BMI > 30 kg/m2) was positively correlated with hypertension (r=0.103 and 0.139) and this association was statistically significant (p=0.01 and 0.001). A weak positive correlation was observed between Waist circumference (WC) and HTN and it was found to be statistically significant (p =0.001). A study conducted in rural areas of Thrissur to assess the Prevalence and risk factors of hypertension among adults aged 25-64 years found that the risk factors significantly associated with hypertension, were age ,male sex, central obesity, lack of physical activity , excess salt intake, and current smoking. (Catherine Simon, Saju C. R., Jeffy Binu 2017)

5.CONCLUSION

In the present study prevalence of hypertension was 46.71% (327), among them 101 (31%) were previously diagnosed with HTN while 226 (69%) were new cases detected in this study.

The mean systolic BP was134.2±18.6 and diastolic BP was84.9±9.23. The mean weight was 56.56± 10.59 and waist circumference was 90.03 ± 11.28. A positive correlation was found between Blood pressure and selected demographic variables like age, monthly income, general obesity and central obesity, where as a negative correlation was observed with occupation and education. The increasing trend of hypertension in the women population is an emerging problem in developing countries like India especially in Kerala. Creating awareness about early detection and treatment of hypertension among women should be initiated in the community. Screening should also be utilized as an opportunity to emphasize on risk factor modifications for the prevention and control of hypertension.

Conflict of interest: Author declares no conflict of interest.

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