



## ASSESSMENT ON AWARENESS OF TOBACCO SMOKING AND ITS RISK IN HYPERTENSION

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### ABSTRACT

**Background:** Cardiovascular diseases (CVDs) are the most serious among all human diseases. Cigarette smoking and exposure to second hand smoke is an emerging risk factor for CVD, comprising 10% of all CVD cases according to World Health Organization. The main aim of the study is to assess the awareness about tobacco smoking and its risk for hypertension and other CVDs among people in South Kerala. **Objective:** To obtain the qualitative and quantitative data regarding the awareness and prevalence of tobacco smoking and its risk for CVDs in South Kerala and to assess other risk factors leading to CVDs. **Methodology:** A cross-sectional observational study was conducted among 300 males of age group 18- 65 years in South Kerala, and data was analyzed by statistical tools. **Result:** Total 300 males voluntarily participated in the study, among which 37% (n=111) were hypertensive smokers and 27% (n=81) were hypertensive non-smokers, while 12.66% (n=38) were normotensive smokers and 23% (n=70) were normotensive non-smokers. In this, 41.86% responded that food habit is the major risk factor for hypertension, followed by smoking (29.23%). Among the hypertensive patients (64%), only 34.33% followed healthy diet in spite of being recommended by health care professionals to control BP, and only 54% are properly taking medicines. **Discussion:** Based on the study results, most of the males who are hypertensive are smokers and do not follow healthy diet or take proper medicines, even though they are aware about the complications. People need to be educated well about the cardiac complications due to improper control of blood pressure. **Conclusion:** Through this study an awareness can be provided on the complications of tobacco use and importance of medication adherence and diet to prevent CVDs.

**KEYWORDS:** hypertension, smoking, cardiac complications.

### INTRODUCTION

Cardiovascular diseases (CVDs) are marked as the most serious and complex diseases among all human diseases, with their risk factors varying from lifestyle, genetic and environmental factors. Among CVDs, heart disease and stroke are categorized as the major elements that contributes to the leading cause of death worldwide.<sup>[1]</sup> One of the global targets of healthcare system in non-communicable diseases is to reduce the prevalence of hypertension and thus CVDs by 25% by the year 2025.<sup>[2]</sup>

Although many people are aware that smoking is injurious to health, majority of them do not know how it affects health and what the high risk complications of smoking are. The component of cigarette, known as nicotine possess hazardous chemicals such as free radicals and oxygen radicals that, upon smoking enters into the airway tract and leads to endothelial dysfunction and can damage and increase serum lipid levels (VLDL, total cholesterol) and decrease in HDL and

apolipoprotein A1. These effects can lead to narrowing of blood vessels, accumulation of clots in any part of blood vessels and cause complications. There is a possibility for these effects to occur even in occasional smokers and such effects can lead to complications of CVD such as stroke, myocardial infarction, heart failure, etc.<sup>[3,4]</sup> Cigarette smoking and exposure to second hand smoke is an emerging risk factor for hypertension and CVDs, comprising 20% of all CVD cases according to World Health Organization (as of September 2020). Similar studies reveal that exposure to second hand smoke by children can increase their risk for early hypertension and early CVD which strongly improved upon cessation of exposure. Also, it is noticed that upon cessation of smoking by smokers, there is increased chances of improvement in heart rate, blood pressure, epinephrine and nor-epinephrine concentrations in smokers (upto 50%).<sup>[5]</sup> Hypertension is defined as the condition in which blood pressure is elevated up to or higher than 140/90mmHg. It is classified among the

worldwide epidemics causing a decline in quality of life of individuals.<sup>[6]</sup> An approximation of 1.13 billion people worldwide are affected<sup>[2]</sup>, which can contribute as a factor to several conditions such as stroke, myocardial infarction, renal disorders, and other CVDs. The major risk factors are genetic predisposition, diet (high salt intake, oily and processed food, etc.), lifestyle, cigarette smoking, alcohol consumption, and presence of other diseases such as obstructive sleep apnea.<sup>[1]</sup>

The incidence of hypertension can be prevented to a great extent by avoiding tobacco and alcohol consumption along with following proper diet and exercise, lifestyle and management of stress. There are several measures to quit smoking or tobacco use, including use of nicotine gums or patches, avoiding triggering factors, breathing exercises, building up of confidence, limiting the use of alcohol, etc.<sup>[7]</sup> The exact mechanism and effect of smoking and hypertension is still under debate, as in some studies the exposure to smoking and its chemicals have shown to produce reduced incidence of pregnancy induced hypertension among growth restricted babies, and in some studies it is shown to exhibit hypertension in patients who were ex-smokers or non-smokers than regular smokers. Although it might be difficult to quit tobacco use, it is always a better option to bear the temporary side effects of quitting than the life threatening complications.<sup>[8]</sup> Through this way, a majority of CVDs can be prevented at early stage and the quality of life of individuals can be enhanced. The underuse or non-optimization of preventive strategies can result in exacerbation of future CVD burdens worldwide. It is thus important to analyze the association between tobacco smoking and its exposure with the risk for CVD and other complications.<sup>[9]</sup>

## MATERIALS AND METHODS

The study was based on a cross-sectional observational study carried out among 300 people in urban and rural

areas of south Kerala for a period of one month. The method of sampling used were simple random sampling method. Study was conducted only in male population of the age group 20-65 years in south Kerala. People who were willing to participate as well as subjects with or without hypertension were considered in the study. The study also included people with different patterns of smoking (ex-smokers, non-smokers, regular smokers).<sup>[10]</sup> Females were not included in our study due to too low rate of smoking.<sup>[11]</sup> Excluded participants included one who had invalid, error and incomplete data, bedridden and chronically ill are excluded from the study. People were divided on the basis of their age as 20-35, 36-51, 52-65.<sup>[12]</sup> A preformed and structured questionnaire based study is carried out and data is collected and documented. The questionnaire included details about the knowledge about tobacco effect on cardiac complications, past medical history, co-morbidities, details regarding medication history, family history and smoking pattern and extend of adherence to the treatment by each patient. The data obtained were analyzed using statistical method.<sup>[10,13]</sup>

## ETHICAL CONSIDERATION

Ethical approval was obtained from the institutional ethical committee of Ezhuthachan College of Pharmaceutical Sciences prior to the study. All the participants were informed the purpose of the study and were asked to participate in the study voluntarily. The study was carried out in accordance to the guidelines.

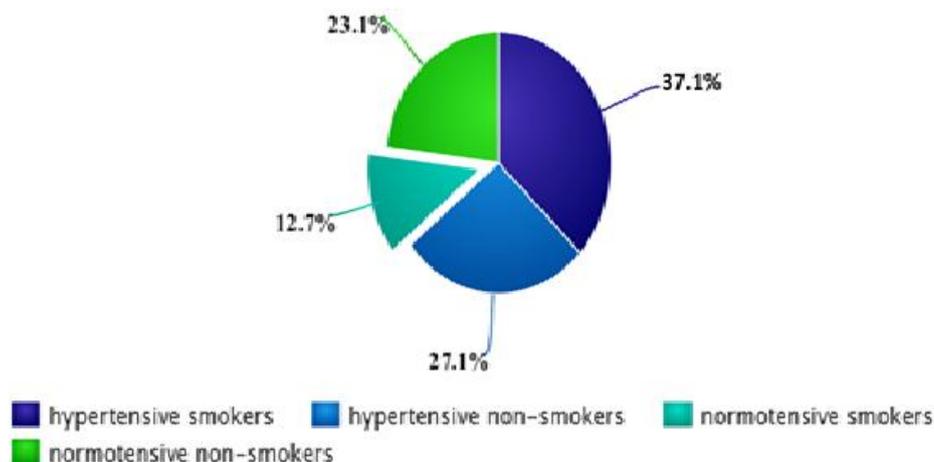
## RESULT

In this study, a total of 300 males voluntarily participated, among which a total of 192 (64%) subjects were hypertensive, and 108 (36%) were non-hypertensive, 149 (49.6%) subjects had a habit of smoking while 151 (50.3%) subjects did not have a habit of smoking. The study subjects were grouped into different age groups.

**Table 1: Data representing the different age groups and percentage of study subjects versus their hypertensive and smoking status.**

AGE (years)	NUMBER OF HYPERTENSIVE CASES (n <sub>1</sub> )	NUMBER OF NON-HYPERTENSIVE CASES (n <sub>2</sub> )	NUMBER OF SMOKERS (n <sub>3</sub> )	NUMBER OF NON-SMOKERS (n <sub>4</sub> )	TOTAL (N=300)
20-35	22 (28.5)	55 (71.4)	12 (15.6%)	65 (84.4%)	77 (25.6%)
36-51	58 (53.7%)	50 (46.3%)	55 (51%)	53 (49%)	108 (36%)
52-65	112 (97%)	3 (2.6%)	82 (71.3%)	33 (28.7)	115 (38.3%)

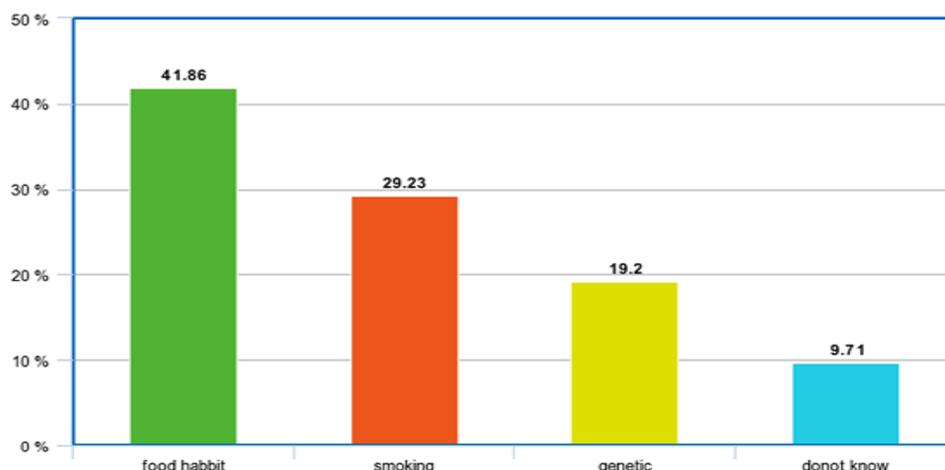
It is clear that majority of the study subjects belongs to the age group of 52-65 years. It is also seen that hypertensive cases are at high incident between this age group. There were 22 (28.5%) hypertensive cases and 12(15.6%) incidence of smoking cases among the age group of 20-35. Within the age group of 36-52, the cases of hypertension were 58 (53.7%) and smoking were 55 (51%). When emphasizing on elderly, that is, age group of 52-65, the hypertensive cases were 112 (97%) and smoking were 82 (71.3%).



**Figure 1: Chart representing the data of prevalence of hypertensive smokers, hypertensive non-smokers, normotensive smokers and normotensive non-smokers among the study subjects.**

Through this study it was found that 37% (n=111) were hypertensive smokers and 27% (n=81) were hypertensive non-smokers, while 12.66% (n=38) were normotensive

smokers and 23% (n=70) were normotensive non-smokers.



**Figure 2: Graph representing the response given by the study subjects for the major risk factors of hypertension.**

Here the knowledge on major risk factor for hypertension is analyzed and plotted in a graph. It is seen that the majority of subjects responded as food habit being the most common risk factor for hypertension

(41.86%), followed by smoking (29.23%) and genetic (19.2%). Approximately 9.71% of the sample size did not know about any major risk factors causing hypertension.

**Table 2: Data representing the pattern of smoking, and knowledge towards complications of hypertension and smoking responded by study subjects.**

VARIABLES	NUMBER (n) OF RESPONSE	PERCENTAGE (%)
<b>SMOKING PATTERN (NUMBER OF CIGARETTES SMOKED PER DAY)</b>		
<5	92	61.74
5-10	46	30.8
>10	11	7.38
<b>KNOWLEDGE ON COMPLICATIONS OF HYPERTENSION AND SMOKING</b>		
Heart disease	76	25.33
Stroke	163	54.33
Kidney disease	34	11.33
Eye disorders	27	9

The pattern of smoking (number of cigarettes smoked per day) and their percentage among the smokers ( $n_3=149$ ), and the knowledge or perception of all study subjects towards the complications of hypertension and smoking ( $N=300$ ). It is evident from the study that approximately 49.6% of the study subjects have a positive smoking status of which around 8% subjects have a habit of smoking more than 10 cigarettes per day,

while 30.8% smokes between 5-10 cigarettes per day and around 61.74% smokes less than 5 cigarettes per day. Of the total study sample size, around 54.33% believes that hypertension can lead to complications that may be life threatening such as stroke, while 25.33% believes that it may lead to complications of heart diseases, and 11.3% believes it can cause renal diseases while 9% of them believes it can cause eye disorders.

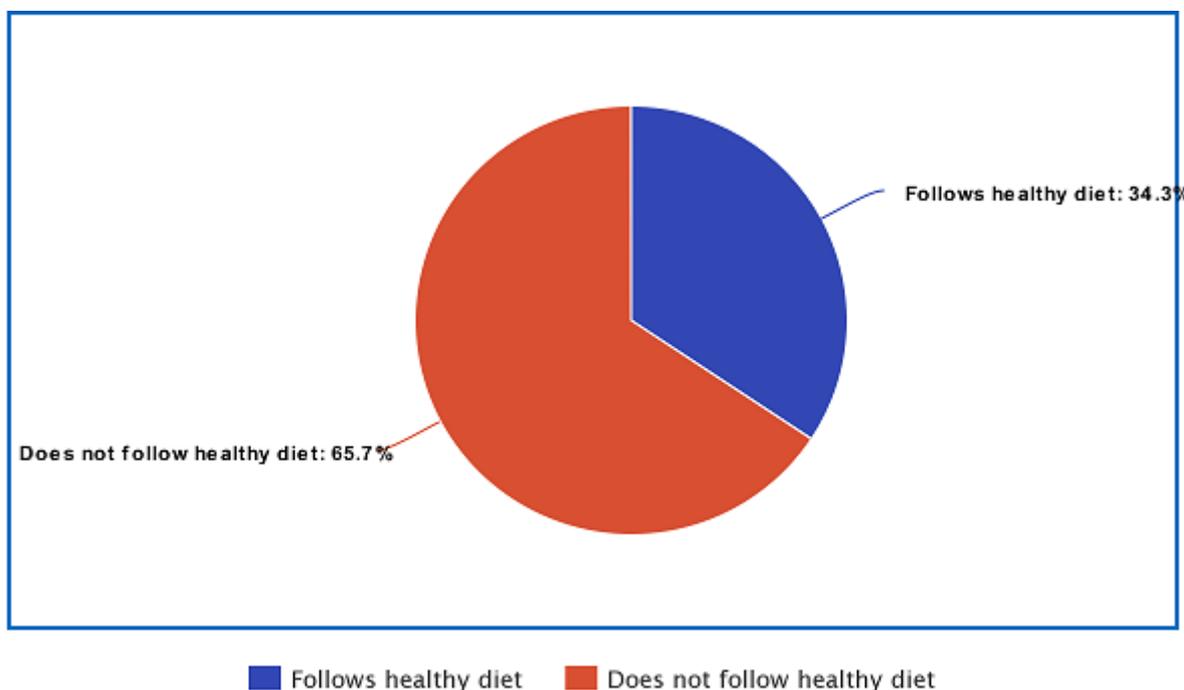


Figure 3: Chart representing the data of prevalence of hypertensive subjects in following diet.

It is evident that out of 64% of the hypertensive study subjects, only around 34.3% follow healthy diet even after being instructed by the health care professionals,

while around 65.6% do not follow any diet to control hypertension.

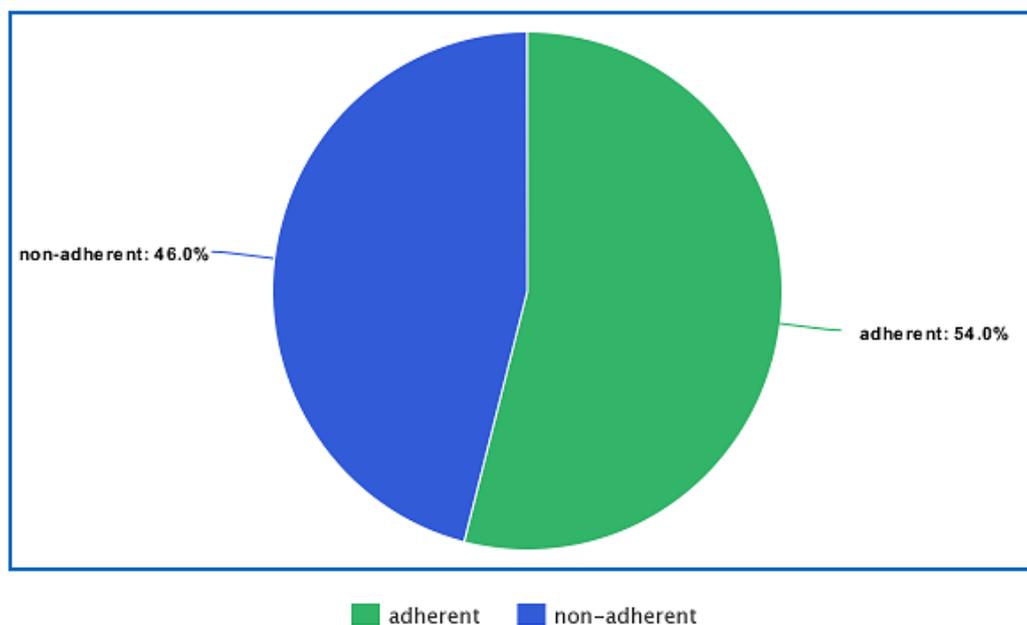


Figure 4: Chart representing the pattern of medication adherence among the hypertensive subjects ( $n_1=192$ ).

Despite being instructed and educated by the health-care professionals, around 46% of subjects do not follow the prescription correctly. And about 54% of study subjects stated that they follow the prescription according to the instructions given by them.

## DISCUSSION

We compared and examined the association between smoking and occurrence of hypertension and analyzed the level of awareness among public towards the complications of hypertension. In this study, it was observed that a majority of study subjects did not follow proper health care steps in order to increase the quality of life despite being instructed by the health care professionals.

It is seen in this study that the majority of subjects responded as food habit being the most common risk factor for hypertension (41.86%), followed by smoking (29.23%). Therefore despite being aware of the risk factors, only 34.3% among the hypertensive subjects follow a healthy diet. Despite knowing that smoking can cause CVDs, around 50.3% of the study subjects have a habit of smoking.

Even though the association between smoking and hypertension is controversial, it is still shown in many studies that smoking and hypertension can lead to life threatening complications. The effect of nicotine present in cigarettes has proven to damage the endothelium and cause elevated epinephrine and nor-epinephrine release and can lead to heart rhythm disorders and finally different complications such as stroke, myocardial infarction, cardiac arrhythmias, other CVDs.<sup>[13]</sup>

In particular, smoking cessation can result in declined chances of complications but may also cause various side effects such as craving, headache, cough, stomach ache, weight gain, etc. This may result in further rebound or use of tobacco in the future that may enhance the risk of CVDs. Thus, it is the responsibility of health care professionals especially holding NCDs to take proper preventive measures in order to promote people in quitting tobacco use. Also, in many studies it is clearly evident that the prevalence of hypertension is rising drastically in rural areas than urban areas. Some of the possible reason for this can be due to lesser out reach of people in rural areas to proper health care, and even lesser awareness on such complications. The people of rural area may not follow proper methods of health care check-ups and may not be able to monitor their health at regular intervals of time due to various factors including low income, lesser health care systems, low awareness on diseases and health, etc.

Therefore all the awareness programs should focus on corrective measures in the diagnosis, monitoring, treatment and control as well as prevention of hypertension in rural areas along with proper counselling and education on lifestyle and dietary modifications,

medication adherence, monitoring of therapeutic outcome at regular interval of time, etc.<sup>[14]</sup>

It is also evident in this study that age is proportional to the occurrence of hypertension, leading to a conclusion that age could be a risk factor for hypertension. It is evident from many studies that hypertension can occur in both genders at equal rate with increase in age. Also, even after completely educating patients from hospital, only 54% of the hypertensive subjects follow their prescription correctly. This negligence could be due to various factors, but should be a concern for health care professionals.

Thus, screening measures should be adopted to identify all hypertensive cases at early stages and provide proper treatment in order to reduce the health care burden and enhance quality of life of individuals. It is the sole responsibility of the health care professional to make sure each patient goes out with complete knowledge regarding the disease, drugs used, and lifestyle and dietary changes that can help bring therapeutic outcome in early stage. People must be educated to reduce the amount of salt and oil used in food, and to avoid physical inactivity, to properly have check-ups, etc. such measures can provide a relief to the burden up to greater extent. Medication adherence is another field which alters the therapeutic outcome. It is highly necessary to educate and make sure the patient follows proper methods of medication administration and comes back for refill at regular intervals.

## CONCLUSION

Hypertension is classified as an epidemic that is shown to spread faster worldwide. Of these, it is especially high in rural areas that is to be taken care of. The rise in such levels in the rural areas could be of several reasons, but it is our duty to ensure they get all the resources to enhance their healthcare systems, or it can lead to major social and economic burdens for the country and its health care system. We recommend many strategies in order to bring awareness to the public, such as an awareness campaign, screening for blood pressure among prevalent areas, taking proper techniques to ensure medication adherence, avoiding unnecessary poly-pharmacy that may affect public's economic burden. Patients should be well educated regarding importance of lifestyle changes, management of stress, hazardous role of physical inactivity, dietary modification and adverse effects of excess salt intake and also the role of health care system in enhancing their health care outcome.<sup>[13,14]</sup>

When emphasizing on cigarette smoking, due to the addictive nature of nicotine and availability of modern cigarettes, cigarettes are marked at first position in the most dangerous drugs freely available to people. The people are unaware about the complications of tobacco and its smoke exposure, or could be negligent. Proper awareness can be provided on the complications of tobacco use and importance of medication adherence to

prevent such complications. Measures can be taken in order to ensure proper awareness is brought about and it is evenly distributed throughout the population.<sup>[13,15]</sup>

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