

# A hospital based cross sectional study to evaluate awareness of lifestyle interventions among hypertensive patients in Sikkim (North-Eastern State of India)

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## Abstract

**Introduction:** Hypertension (HTN) or high blood pressure (BP) is the most important cardiovascular risk factor worldwide, contributing to around one half of the coronary heart disease and two thirds of the cerebrovascular disease burdens. Effective prevention, detection, treatment, and control of BP continue to be an important goal for health care providers. A positive impact of life-style interventions is a well known fact. Awareness of HTN remains an important concern in this mountainous and predominantly rural population. **Objective:** To evaluate the awareness of lifestyle interventions among patients of hypertension. **Methods:** A cross-sectional study was conducted in Sikkim Manipal Institute of Medical Sciences in general medicine OPD from Jan 1, 2017 to Jan 15, 2017. All the stable hypertensive patients, attending medicine OPD aged >18 years were recruited in the study. Patients were interviewed using a semi structured questionnaire regarding knowledge of life style interventions. **Results:** Among all the hypertensive patients ( $n = 100$ ), 60 patients had adequate knowledge (>50%) and 40 patients had inadequate (<50%) knowledge of these interventions. Significant association between educational background and knowledge on lifestyle interventions was present. Urban population was more aware as compared to rural population Blood pressure was significantly under control in the aware population. **Conclusion:** Patients knowledge on lifestyle interventions for the management of blood pressure is important. The rural population and uneducated people have inadequate knowledge on lifestyle modifications of hypertension. Structured teaching programs are needed to improve awareness about the lifestyle changes.

## Introduction

Hypertension imposes a substantial public health burden on cardiovascular health status and healthcare systems in India [1]. It is responsible for more than half of all stroke deaths and approximately a quarter of all coronary heart disease deaths in India [2]. Recent studies from India have shown the prevalence of HTN to be 25% in urban and 10% in rural people [3]. In the year 2000, the combined urban and rural prevalence was 20.6 % among males and 20.9% among females and in 2025 the projected rate will be 22.9% among males and 23.6% among females [4]. Awareness and control of HTN in India ranged from 20 to 54% and 7.5 to 25%, respectively in a Meta analysis of various studies [5]. Very few studies related to prevalence and awareness of hypertension in Sikkim is found in the literature. A study carried out among the Lepchas of Sikkim Himalayas has documented hypertension prevalence of 30.77% among males and 25.77% among females [6]. This is rather more as compared to rest of India.

According to a multicenter study from India on awareness, treatment, and adequacy of control of HTN, only about 25.6% of treated patients had their BP under control [7]. There is evidence that life style modifications and adequate control of

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blood pressure with medicines can help manage hypertension effectively and prevent complications such as stroke [8]. Inadequate control of blood pressure may be related to patient barriers such as lack of knowledge on hypertension and its treatment, cultural beliefs, access to care, high cost of medicines and discontinuation of medicines as a result of side effects [9]. Insufficient knowledge of hypertensive patients about the administration of their medication and life style modifications could lead to low control of their blood pressure [10]. This has been reported among hypertensive patients both in the developed and developing countries [11]. The highest perceived barrier of life style modification practices related to hypertension is lack of knowledge in India also [12].

Recommended life style interventions and their effect on blood pressure [13].

Non Pharmacological Measures	Recommendations	Estimated Systolic BP reduction (mm Hg)
Body weight reduction	Attain a normal body weight with a BMI ranging from 18.5 to 24.9kg/m <sup>2</sup>	A 10 kg loss in body weight attenuates BP by 5-20 mmHg
DASH type dietary pattern	Intake of vegetables, fruits and milk products with low saturated and low total fat.	Alteration in dietary habits lowers BP by 8-14mmhg.
Cut salt	Cutting down salt intake to the fullest extent possible Optimal level: 1.5g/day sodium or 3.8g/day sodium chloride	Reduce salt intake cuts BP by 2-8mmHg
Exercise	Regular aerobic physical activity for about 30 min/day maximum days of the week	Attenuates BP by 4-9 mmhg
Alcohol intake	Maximum 2 drinks/day for men and 1 drink/day for women and light weight persons	Lowering alcohol intake lowers the BP by 2-4 mmhg.

Sikkim is a tiny hilly state in north-east India. According to 2011 census, 74.85% of total population lives in rural area and only 25.15% lives in urban area. Young mountains with difficult terrain characterizes its geography. The state has adult literacy rate around 82.2 % according to the census 2011. Average literacy rate in Sikkim for rural areas was 78.95% *slightly less as compared to urban areas*. There is a significant difference in the rural and urban areas of India for awareness and control of HTN [2]. At the same time, eastern India had the highest prevalence of hypertension equaling the prevalence seen in urban parts of India. Rural parts of India have lower literacy rates and have wider disparity in access and quality of health services as compared with urban areas [2]. So, the awareness of HTN remains an important concern in this predominantly rural population.

## Materials and Method

**Study design and setting-** This prospective cross sectional was carried out in a tertiary care hospital, Sikkim Manipal Institute of Medical Sciences in a period of 15 days between Jan 1, 2017 to Jan 15, 2017.

**Inclusion Criteria-** included adult patients >18 years of age, attending medicine OPD and having hypertension for more than six months with no co-morbidities.

**Exclusion criteria-** Patients having acute problems and those did not give consent were excluded from the study.

**Study size-** A total of 100 hypertensive patients, including 62males and 36 females who fulfilled the inclusion criteria, were selected. Purposive sampling method was used to select the hypertensive patients.

**Procedure and methods of data collection-** Ethical clearance was sought from the institutional ethical committee before data was collected. Face to face interviews were conducted after the patients oral consent has been sought. Purposive sampling method was used to select the hypertensive patients.

The semi structured questionnaire captured the following: socio- demographic and clinical characters, duration of hypertension and intake of anti-hypertensive drugs. In addition knowledge and performance on 6 lifestyle modification which included aerobic exercise at least 30 minutes per day, four days per week, reducing dietary salt to less than 6g NaCl per day, limiting alcohol intake to less than 3 units per day for men and less than 2 units day for women, avoiding cigarette smoking, maintaining healthy weight and eating a diet high in fruits, nuts and vegetable and low in fat was gathered. The data were collected in the private room by two researchers, knowledge and perceptions sheet toward lifestyle behavior modifications were distributed to the attending hypertensive patients.

Each of them was asked to complete assessment sheets and return them to the researchers in the same visit. In the case of patients were illiterate, the sheets were filled by the researchers through in-depth interview by reading each question to the patients and take answer from them.

## Results

Among all the hypertensive patients examined in the study ( $n = 100$ ), 62 were females and 38 were males. 92 patients were receiving pharmacotherapy, and only 32 patients had their blood pressure adequately controlled. 20 females and 12 males had BP under control and the difference was statistically insignificant [ $P=0.94$ , OR 1.03, CI 95 % ( 90.43-2.45)]. Out of those patients with adequate knowledge ( $N=60$ ), 30 patients follow all the interventions, 16 followed some and 14 did not follow any despite having knowledge of different methods of the same. 40 patients had < 50% knowledge of those interventions. Among life style interventions in patients with adequate knowledge, awareness regarding salt restriction was highest, present in 42 patients followed by regular exercise in 35 patients, abstinence from smoking in 32, and regarding DASH eating plan; it was lowest, present only in 30 patients. 6 patients consumed alcohol routinely. In aware but non followers, 6 were smokers and 2 consumed alcohol regularly.

In patients with inadequate knowledge ( $N=40$ ), 11 patients had knowledge regarding salt restricted diet, 5 and 7 patients were aware of abstinence from smoking and regular exercise respectively. None of these patients had knowledge of DASH eating plan. 12 patients were smokers and 24 patients used to consume alcohol routinely.

20 were vegetarian in adequately aware population as compared to 6 in inadequately aware one.

52 were uneducated or had only basic education out of total 100 (62 females and 38 males) patients. 26 patients out of 60 patients and 26 patients out of 40 patients had only basic education or were uneducated. Effect of gender on patients knowledge on life style modification for the management of hypertension was insignificant [ $P=0.74$ , OR 0.87, 95% CI (0.38-1.97)] and for educational background it was significant [ $P=0.04$ , OR 0.41, 95%CI (0.18-0.94)]. Urban to rural ratio was 54:6 as opposed to 20:20 in unaware group. Urban population was more aware as compared to rural population [ $P<.0001$ , OR 9, 95% CI (3.12-25.63)]. Blood pressure was significantly under control in the population having adequate knowledge [ $P=0.04$ , OR 2.6, 95%CI (1.05-6.77)]. Difference in BMI was insignificant among both the groups [ $P=0.72$ , OR1.17, 95%CI (0.49-2.86)]. Similarly, it was insignificant for smoking/tobacco consumption or alcohol intake ( $P=1$  and 0.142 respectively).

**Measurements and calculation-**To determine respondent's knowledge on the life style modification for managing hypertension, a scoring system was employed where patients were given a score on each life style modification known, and the patients were divided as having <50% knowledge(knowledge of <3interventions) or equal to or > 50% knowledge (knowledge of  $\geq 3$ interventions) about those. Those patients having < 50% knowledge were considered to have inadequate and equal to or > 50% knowledge were considered to have adequate knowledge. BMI and waist circumference was noted to check maintenance of healthy weight. Three blood pressure measurements were obtained by use of standardized mercury sphygmomanometer after a 5-minute sitting rest. B.P. was considered high if average systolic blood pressure  $\geq 140$  mm Hg, diastolic blood pressure  $\geq 90$  mm Hg.

**Data analysis** was done using SPSS version 15. Fisher exact test was used to test the association between the variables and a p value of  $\leq 0.5$  was considered indicative of statistically significant difference. The likelihood of occurrence of events was tested by odds ratio at 95% confidence level.

**Table-1: Distribution of studied hypertensive population according to their socio demographic profile (N=100)**

Variable	Number N=100	Patients with adequate knowledge	Patients with inadequate knowledge	P value	OR 95% CI
<b>Age</b>					
20-40	18	10	8	0.14	
41-60	54	20	34		
61-80	28	16	12		
<b>Gender</b>					
Male	38	22	16	0.74	0.86(0.38-1.97)
Female	62	38	24		
<b>Educational level</b>					
Uneducated or Basic	48	26	26	0.04	0.41(0.18-0.94)
Educated	52	34	14		
<b>Marital status</b>					
Married	96	59	37	0.18	4.78(0.48-47.72)
Unmarried	4	1	3		
<140/90	32	24	8	0.04	2.69(1.05-6.77)
>140/90	68	36	32		
<b>Smokers</b>	14	8	6	0.81	0.87(0.28-2.73)
<b>Alcohol use</b>	22	10	12	0.12	0.47(0.18-1.21)
<b>BMI</b>					
<24.9	28	16	12	0.72	1.17(0.49-2.86)
>25	72	44	28		
<b>Location</b>					
Urban	74	54	20	<.0001	9 (3.12-25.63).
Rural	26	6	20		

**Table-2: Knowledge on life style modifications in studied population.**

Intervention	Number of patients with knowledge(N=100)
1. Reducing dietary salt to less than 2.4g per day	53
2. Aerobic exercise at least 30 minutes per day, four days per week.	42
3. Avoiding cigarette smoking	37
4. Limiting alcohol intake	32
5. Maintaining a healthy weight	32
6. Eating a diet high in fruits, nuts, vegetables and low in fat	30

**Table-3: Practice of life style interventions among patients having adequate knowledge (N=60)**

Patients	Number
Aware and follow all	30(50%)
Aware and follow some	16(27%)
Aware but do not follow	14(23%)

## Discussion

Hypertension is one of the most common chronic health conditions and a leading cause of mortality and morbidity [14]. Control of hypertension by lifestyle modifications can decrease the cost of health care by decreasing the use of pharmacological and invasive cardiovascular treatments [15,16]. The study was conducted to assess the level of knowledge relating to lifestyle modifications. In socio-demographic characteristics of the hypertensive patients, the study revealed that the majority of the patients (54%) were in 41-60 years old. This was consistent with the finding of few studies [17, 18] where, a high prevalence of hypertension was found among older adults. There were more females. This may be due to the effect of postmenopausal hormones deficiency and some risk factors as obesity, stressful situation and it was similar to a study [19]. As regard to knowledge about lifestyle behavior modifications, the study results revealed that more than half of the patients had fair to good /adequate knowledge about lifestyle behavior modifications (Table 1). A similar study revealed that more than half of hypertensive patients were aware of the family history, smoking and excessive salt intake increased risk of hypertension [20]. This was in contrast with the study where knowledge of the participants about lifestyle modifications such as activity and exercises to control hypertension was poor [21]. Similarly, another study revealed that more than half of the patients were had fair knowledge, 23.8% from them were had poor knowledge and only 8.9% from them were had good knowledge about lifestyle behavior modifications [22]. In our study, 40 patients had inadequate knowledge regarding life style changes. This also in the similar to a study [23] which reported that up to 80% from hypertensive subjects were not aware about the role of various lifestyle modifications such as DASH eating plan and maintenance of healthy body weight.

Among life style interventions in patients with adequate knowledge, awareness regarding salt restriction was highest followed by regular exercise and abstinence from smoking whereas regarding DASH eating plan, it was lowest in our study. 6 patients consumed alcohol routine. This was similar with a study which found that the excessive salt intake as a risk factor for hypertension was a most known risk factor (77.4%), though in that study the least awareness was regarding moderation of alcohol consumption (47.6%) [24]. On the other hand, another study revealed that more than 70% of patients

were aware that stress, high cholesterol and obesity were the risk factors of hypertension and 52.7% from them were not aware that the lack of physical activity was risk factors for hypertension [25]. One more study reported that the awareness regarding stress, excessive salt intake and obesity is good but poor awareness regarding excessive alcohol intake, smoking and a sedentary lifestyle [26]. Awareness of DASH eating diet was least in our study. At the same time, importance of maintaining healthy weight in controlling hypertension is also not known to many patients. It was similar to a study [23]. One study had shown that the Sixty percent 60%, 62% and 59% of respondents were aware of lifestyle modification such as regular exercise; reduce salt intake and eating a diet high in fruits, vegetables and low in fat respectively. In addition 38% were aware of avoidance of cigarette smoking and 46% were aware of reduction in alcohol intake [27].

In the United State a study conducted indicated that of hypertensive patients interviewed 78% of patient's reported receiving advice on regular Exercise, 69.3% were aware of reducing salt intake, 61.9 % were aware eating habits and 43.5% were aware of advice on reduced alcohol intake[28].

Thirty percent (30%) of hypertensive patients interviewed in South Africa reported that they received advice on the benefits of exercise, 69% were advised on reduced salt intake and 50% on a balanced diet. Forty four (44%) of respondents were advised on reduced alcohol intake and 35% were advised on cigarette smoke cessation [29]. This studies suggest that counseling or advise on each of these interventions should be provided by health care providers to ensure sufficient awareness and adherence to these interventions. Our patients were less familiar with are DASH eating diet and maintenance of healthy weight. Probably counseling on these life style interventions was not provided to those patients also.

Adequately aware population does not practice those interventions despite having knowledge of the same. (Table3) This was similar to a study which showed that 80% of the hypertensive patients knew that they should limit their salt intake but only one third always avoided salty foods [30]. This was also seen in a study where (60%) respondents were aware of regular aerobic exercise however only 40% were practicing it. 62% of respondents were aware of the practice of reducing salt intake but only 42% were actually practicing this . With

regard to the practice of avoidance of cigarettes smoking; although 36% of respondents were aware, 20% of them were smokers [27].

Significant association between educational background and knowledge on lifestyle interventions was present. One study conducted in china has shown that about 77.3% of hypertensive patients were illiterate. Illiterate patients had difficulty in accepting hypertension knowledge [31]. According to one study, most of the hypertensive patients had no information at all about disease due to insufficient educational sources[33]. This could be one of the reasons of lack of awareness in our study also. Another study revealed that most of the subjects were not aware about life style interventions probably due to poor educational level [22].

We found that urban population is more aware of the interventions than rural population as they are more exposed to educational resources and have good access to health care facilities. This result was consistent with a meta analysis of a study [2].

## Conclusion

Awareness as well as practice of lifestyle interventions is important in management of hypertension. Proper counseling about all the risk factors and interventions should be provided by health care providers especially in rural areas with more elderly population and poor health care facilities.

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