

# Health Education: an Effective Intervention in Hypertensive Patients.

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## Research Article

**Abstract: Objective:** Assessment of impact of health intervention on KAP and hypertensive status of patients in an urban slum of Mumbai. **Material and Methods:** A cross-sectional study was conducted at Shivaji Nagar urban slum which is a field practice area of Department of Preventive and Social Medicine, of TN Medical College Mumbai. Hypertensive patients above 40 years of age were included in this study. The information was gathered by personal interview using semi-structured proforma. **Results:** Out of 340 subjects 176 (51.76%) were males. Before intervention 83.42%, 69.11%, 73.24% patients had poor knowledge, attitude and practices respectively which decreased to 25%, 21.76%, 33.81% respectively. Mean systolic BP, Diastolic BP, Body mass index and weight was also decreased as practices of patients improved to after health intervention. There was improvement in self care practices and life style modification factors. **Conclusion:** People have to be educated through mass media on hypertension and its risk factors. The health workers have to play part by educating the people and also themselves being an example in avoiding the risk factors for hypertension like consumption of fatty food, alcohol and smoking. People have to be educated on the importance of physical exercises and have to be encouraged to do them.

**Keywords:** Hypertension, KAP, health intervention, urban slum.

## Introduction

Cardiovascular diseases have been proved to be the leading cause of morbidity and mortality in developed countries, and are gradually emerging as an important health problem in developing countries as well. Hypertension (HTN) is one of the most common cardiovascular diseases with a prevalence ranging from 10 to 20% among adult population.<sup>[1]</sup> Subjects with hypertension possess two fold higher risk of developing coronary artery disease (CAD), four times higher risk of congestive heart failure and seven times higher risk of cerebrovascular diseases (CVD), compared to normotensive subjects.<sup>[2],[3]</sup> The 'Global Burden of Disease study' has projected CAD and CVD as the leading cause of death worldwide by the year 2020.<sup>[4]</sup> Hypertension, an iceberg disease could be described as the 'sleeping snake'- which bites when it wakes up. Present study is undertaken mainly to highlight the illness perceptions and lifestyle adopted by the patients after diagnosis and identify the area which need urgent attention to modify the life style and promote practices of self care among them, and to assess the impact of health education, dietary counselling and regular

physical exercise to improve the health and blood pressure control in hypertensive patients.

## Material and methods

The study was conducted at Shivaji Nagar urban slum which is a field practice area of Department of Preventive and Social Medicine, of parent Medical College. This is situated at an eastern suburb of Mumbai which comes under the jurisdiction of M East Ward of Municipal Corporation of Greater Mumbai. The population of Shivaji Nagar consists of people who have migrated from different parts of India, mainly from Uttar Pradesh, Bihar, West Bengal, Madhya Pradesh, Andhra Pradesh and Tamil Nadu. They have migrated to Mumbai in search of job and are now engaged in small scale industries like Zari work, Bag making, Mat weaving, Carpentry, tailoring etc. Most of the men are self employed and women are house wives, maid servants or vegetable vendors. Study population was selected from Hypertensive patients of age 40 years & above.

The present community based descriptive epidemiological interventional study was conducted during the period of October 2009 to September 2011.

Total Population of Study Area = 1, 22,000.

Population > 40 years = 24400 (Applying national demographic parameters).

Prevalence of Hypertension >40 years in an urban slum of Mumbai = 13.9 %<sup>[5]</sup>.

Expected number of hypertensive patients in study population = 3391.6

Taking 10 % of expected patients = 339.16 Sample size (n) = / > 340. So, total 340 known hypertensive patients were involved.

This study was conducted in the following 6 phases-

1. Preparatory Phase: October 2009 to December 2009 (2 months)
2. Phase of Pre Intervention Data Collection: January 2010 to March 2010 (3 months)
3. Intervention Phase: April 2010 to March 2011 (1 year)

4. Phase of Post Intervention Data Collection: April 11 to June 11 (3 months)
5. Phase of Data Analysis: July 2011 to August 2011 (2 months)
6. Documentation Phase: September 2011 (1 month)

Semi structured interview schedule was constructed relevant to the study. This interview schedule was tested by pilot study on 25 hypertensive patients attending geriatric clinic in Urban Health Center. Appropriate changes were done based on pilot study and the interview schedule was finalized. A checklist was prepared for interview schedule, observation and Health education session. Voluntary consent form was prepared in English, Hindi and Marathi.

By taking, inclusion and exclusion criteria into consideration, total 340 known Hypertensive patients were selected by employing simple random sampling method. Home visits were done between 10.00 am to 4.00 pm on working days.

The information was collected about various socioeconomic factors, illness perceptions, family history, addiction, duration of disease, exercise, complications, associated disorders, life style, self care etc. on preformed, pre tested interview schedule by investigator himself. Height, Weight and Blood pressure were measured by using appropriate technique.

Participants were followed up for 12 months from April 2010 to March 2011 for intervention. Each hypertensive patient had been given one individual number like 1/2010 to 340/2010. Regular follow up and monitoring of weight, Blood pressure and medical history was maintained in that register.

a.) Formation of batches and fixing of timing:

Total 340 patients were grouped in to 10 batches. Each batch made comprised of 30 to 35 patients. All the participants were told to attend the health education session on particular day depending on the feasibility of all the patients of particular batch. Such health education sessions were conducted every week in morning hour from 10:15 am to 11:00 am. All Patients were motivated to attend the health education session in batches on particular day. Health education sessions were headed by two doctors. The health education was given in local language by the doctor.

b.) Health education sessions:

After assessing their knowledge, attitude and practice towards the hypertension they have been given health education about hypertension in batches. In 30 minutes of one health education session following topics were covered like,

1) Basic information about Hypertension and its symptoms and complications

2) What type of food should be or should not be taken by hypertensive patient.

3) Role of taking regular prescribed medicines.

4) Importance of regular follow-up for their physical examination, Blood pressure and weight check up.

5) Importance of Diet control (salt restriction) and regular physical exercise in controlling Blood pressure.

7) Motivation of the patients to change the life style and self care practices.

Patients were also given information about hypotension, how to prevent it and what to do in hypotensive phase.

So over period of three months 10 batches were covered. Such health education was given in batches every 3 monthly so over a period of one year each batch got at least 3 health education sessions.

c.) Personal one to one counseling:

This is especially given to those who have some difficulty during health education session.

d.) Dietary counseling:

Dietary counselling was done during follow up visits at UHC with the help of dietician. In dietary counselling patients were given information about different types of foods which are harmful or beneficial in hypertension and spacing of meals.

After completion of 12 months of intervention, information was collected about diet, physical activity, addictions, complications, life style changes and self care etc. on the same interview schedule used at the beginning. Blood pressure examination was carried out.

**Eye check up:** Each patient motivated to come for their eye check-up which was done by Ophthalmologist.

Appropriate scoring was done for assessment of knowledge, attitude and practice in both pre intervention and post intervention phases. The Life style and self care improvement was also done at the end of intervention and compared with pre intervention phase. The collected data was numerically coded and entered in Microsoft Excel 2007 and then transferred to SPSS version 15.0 Added data was analyzed with appropriate test like Chi-square test, Wilcoxon signed rank test, Paired 't' test and Mc-nemer test to see the association between Pre and post interventional Parameter, with p value 0.05 considered as significant.

### Assessment of Knowledge, Attitude and Practice of the Patient

a.) Knowledge about hypertension:

Following questions were asked-

- 1) Do you know what hypertension is? Yes/No ;

- If patient able to say; elevated blood pressure – Mark 1  
If, Not – Mark 0
- 2) Do you think more and more people are suffering from Hypertension?  
If Yes – Mark 1 , If no – Mark 0.
  - 3) Do you know what normal blood pressure level is?  
If yes - Mark 1 ;If No - Mark 0.
  - 4) Do you know, what are the symptoms of Hypertension?  
If patient is able to enumerate symptoms of hypertension –Mark 1  
If not – mark 0.
  - 5) Do you know, what are the complications of Hypertension?  
If patient is able to enumerate complications of hypertension –Mark 1  
If Not – Mark 0.
  - 6) Do you think that Diet control (salt restriction) and exercise acts as central pillar in management of Hypertension?  
If yes – Mark 1 ; If No- Mark 0.
    - Minimum marks were ‘0’ and
    - Maximum marks were ‘6’.
    - Poor scorer: the patient who scored mark up to 3,
    - Good scorer: the patients who scored mark more than 3.

**b) Attitude towards hypertension:**

Following Question Were Asked-

- 1.) Do you think, it’s good to include green leafy vegetable in your daily diet?
- 2.) Do you think that it’s good to avoid extra added salts in your diet?
- 3.) Do you think, it’s good to avoid extra Cooking oil in your diet?
- 4.) Do you think, it’s good to have whole fruits rather than to have deserts and sweets?
- 5.) Do you think, that excess alcohol can worsens the blood pressure level?
- 6.) Do you think, Regular physical exercise is essential to control raised blood pressure?

If patient has positive response then they have been allotted 1 mark and if they give negative response then they will have 0 marks

- Minimum marks were ‘0’ and
- Maximum marks were ‘6’.
- Poor Scorer- Score up to 3;
- Good Scorer- Score more than 3;

**c) Practice towards hypertension:**

Following question were asked-

- 1) Are you taking regular prescribed medicine and going for regular follow-up?  
If, Yes-Mark 1 ; No- Mark – 0
- 2) Are you taking Healthy Diet?  
Yes- Mark 1; No- Mark 0
- 3) Are you doing physical exercise to maintain your weight?  
If, Yes- Mark 1; No- Mark -0
- 4) Are you avoiding, extra added salt in your daily diet?  
Yes- Mark 1; No-Mark -0
- 5) When is your last Eye examination done?
  - a. Within last year – Marks 4
  - b. Within last two years – Marks 3
  - c. Within last three years – Marks 2
  - d. Within last 4 year or more or not checked since the diagnosis – Mark 1
- 6) What is the frequency of checking blood sugar level?
  - a. Once in 15 days – Marks 4
  - b. Once in 1 months – Marks 3
  - c. Once in 3 months – Marks 2
  - d. Once in 6 months or more – Mark 1
  - Minimum marks were ‘2’
  - Maximum marks were will be ‘12’
  - Poor scorer-the patients who scored mark up to 7
  - Good scorer- the patients who scored mark 8 to 12.

**Result**

Total 340 hypertensive patients were examined and their knowledge attitude and practices about hypertension were assessed. In pre-intervention phase only 16.58%, 30.89% and 26.76% study population had good knowledge, attitude and practice towards hypertension respectively which after intervention improved to 75%, 78.23% 66.18% respectively. Table 1 shows, after health intervention Improvement in knowledge of patients regarding symptoms and complications of hypertension were seen. Also shows significant improvement seen after health intervention in frequency of BP measurement and eye examination. Table 2 shows significant improvement seen after health intervention in self care practices and life style parameters. Table 3 Health intervention had significant impact on knowledge, attitude and practices of hypertensive patients. Table 4 shows statistically significant difference was seen after health intervention in Blood Pressure, weight and body mass index.

**Table 1: Impact of Intervention on patients' knowledge regarding the symptoms and complications of Hypertension**

	Pre-intervention ( n -340)	Post-intervention (n- 340)
Awareness about symptoms of Hypertension		
Dizziness	172 (50.58%)	284 (83.52%)
Palpitations	57 (16.76%)	182 (53.53%)
Tiredness	42 (12.35%)	114 (33.52%)
Headache	106 (31.17%)	245 (72.05%)
Awareness about complications of Hypertension		
Stroke	25 (7.35%)	150 (44.11%)
Renal complications	10 (2.94%)	100 (29.41%)
Visual complications	12 (3.52%)	77 (22.64%)
Heart Problems	27 (7.94%)	154 (45.29%)
Frequency of BP measurement		
15 days	17 (5%)	46 (13.52%)
1 month	137 (40.29%)	228 (67.05%)
3 month	97 (28.52%)	28 (8.23%)
6 month	89 (26.17%)	38 (11.17%)
Frequency of Eye examination		
One year	48 (14.12%)	86 (25.29%)
Two year	68 (20%)	113 (33.24%)
Three year	46 (13.53%)	86 (25.29%)
Four or more year	178 (52.35%)	55 (16.18%)

**Table 2: Impact of health intervention on patients' self care practices & life style parameters**

Self care practices	Pre-intervention (n-340)	Post-intervention (n-340)
Taking prescription & medications when going out	60 (17.64%)	170 (50%)
Going for regular BP measurement	154 (45.29%)	274 (80.57%)
going for regular eye examination	116 (34.11%)	199 (58.52%)
Life style parameters	Pre-intervention (n-340)	Post-intervention (n-340)
Maintaining healthy diet	17 (5%)	62 (18.23%)
Doing regular physical exercise	26 (7.64%)	172 (50.58%)
Restriction of extra added salt in diet	207 (60.88%)	325 (95.58%)
Restriction of extra cooking oil	113 (33.23%)	242 (71.17%)

**Table 3: Impact of intervention on Knowledge, Attitude and Practices of patients toward hypertension**

Composite score/ n-340		Mean	Std. Dev.	Percentile			Wilcoxon Signed rank test	p- value
				25 <sup>th</sup>	50 <sup>th</sup>	75 <sup>th</sup>		
Score of Knowledge	Pre-intervention	1.89	1.61	1	2	3	15.06; Significant Difference	<0.01
	Post-intervention	4.17	1.7	3.25	4	6		
Score of Attitude	Pre-intervention	2.11	2.01	0.00	2	4	14.74; Significant Difference	<0.01
	Post-intervention	4.3	1.44	4	5	5		
Score of Practice	Pre-intervention	5.42	2.63	3	5	8	15.14; significant Difference	<0.01
	Post-intervention	8.0	2.45	7	8	10		

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**Table 4: Impact of Intervention on Blood Pressure, Weight and Body Mass Index of Hypertensive patients**

Parameters		N	Mean	Std. Deviation	Std. Error of Mean	Paired t-test	p-value
Systolic BP	Pre-Intervention	340	145.58	8.97	0.487	14.348	<0.01
	Post-intervention	340	141.72	10.25	0.556	Significant Difference	
Diastolic BP	Pre-Intervention	340	92	5.98	0.325	14.262	<0.01
	Post-intervention	340	89	7.13	0.387	Significant Difference	
Weight	Pre-Intervention	340	67.8	4.98	0.27	4.034	<0.01
	Post-intervention	340	67.47	4.9	0.26	Significant Difference	
BMI	Pre-Intervention	340	25.09	1.34	0.072	3.85	<0.01
	Post-intervention	340	24.97	1.39	0.075	Significant Difference	

**Discussion:**

In this study, before intervention patient had poor knowledge, attitude and practices which improved significantly after health intervention. The low score of Knowledge, attitude and practice was mainly due to illiteracy, low socioeconomic class of the patients. Also, it was found that the knowledge, attitude and practice score was less in females when compared to males. Patients having poor practice scores had poor control on SBP and DBP.

A study by Olusegun Adesola Busari showed that only 77 (32.1%) patients showed good compliance to antihypertensive drugs. 54.6% patients knew about salt intake and risk of hypertension. 37.9% patients knew obesity is associated with high BP.<sup>(6)</sup> Reasons for poor compliance were poor knowledge, ignorance of need for long term treatment, high cost of drugs, religious practices and cultural beliefs, adverse drug reaction.

On the basis of the result of INTERSALT, an inter-population study involving 10,079 men and women in 52 centers from 32 countries, it had been projected that a 100mmol/day lower intake of sodium over a lifetime would result in a 9 mm Hg smaller rise in systolic pressure from 25 to 55 yrs of age. This could correspond by age 55 to a 16% reduction in mortality for coronary artery disease, 23% for stroke and 13% for deaths from all causes.<sup>(7)</sup>

Salt intake in many countries is between 9 & 12 g/d. The current WHO recommendation for adults is to

reduce the salt intake to 5g/d or less, and the UK and US recommendations are 6g/d or less. However a study on ‘How far should salt intake be reduced?’, which reanalyzes a meta-analyses of randomized long term salt reduction trials, said that the current public health recommendation to reduce salt intake from 9-12 g/d to 5-6 g/d will have a major effect on BP, but by no means is ideal and a further reduction to 3 g of salt per day will have a much greater effect on blood pressure.<sup>(8)</sup>

A study on sodium intake and blood pressure in healthy individuals indicated that 5-16% on healthy persons have a “salt dependent BP” and may benefit from a decrease in dietary salt intake.<sup>(9)</sup>

Not many studies in India have addressed these issues. A study among railway employees in India<sup>(10)</sup> showed a prevalence of HTN to be 6.2% among North Indians when compared to 15.2% among South Indians. However, ironically, salt intake among North Indians was twice as much the intake amongst South Indians.

The National High Blood Pressure Education Program (NHBPEP) established in 1972 found that raised awareness among hypertensives by developing and disseminating educational materials and programs that are grounded in a strong science base and developing partnerships among the program participants. The Coordinating Committee agencies encompass a wide distribution network, supporting a mass media campaign and distribution of educational materials and documents. In 1971, only 51% of Americans with

hypertension were aware of their condition, only 39 percent were being treated, and only 16 percent had achieved satisfactory control. Two decades later, the corresponding figures were 84, 73, and 55 percent respectively.<sup>(11)</sup> Thus primary health education helped patients to raise their awareness about hypertension.

The hypertensive patient should know that how to control overweight and what kind of food should be avoided by them. There is ample scientific evidence that regular physical activity is beneficial. Sedentary individuals have a 20-50% increased risk of developing HTN.<sup>(12)</sup> In the National CSI study,<sup>(13)</sup> 78% of hypertensives were found to be leading a sedentary lifestyle compared to 49% of controls. There has been various studies done in western countries like Community-based case control study through lifestyle intervention and diabetes education programme on Diabetic and hypertensive patients in China revealed that eight face-to-face counseling visits with a healthcare professional over a 3-month period, led to a significant improvement in physical activity levels, as measured by mean energy consumed from physical activity, compared with control (no intervention). In addition, patients who received the intervention had significantly better clinical outcomes, with reduced levels of weight gain, and decreased waist circumference, blood pressure, glucose levels, and HbA1c levels, versus no intervention recipients. <sup>[14], [15], [16], [17]</sup>

Thomas J. Moore, Paul R. Conlin et al "DASH (Dietary Approaches to Study Hypertension) Diet is Effective Treatment for Stage 1 Isolated Systolic Hypertension" found that use of the DASH diet significantly lowered systolic blood pressure compared with the control diet (-11.2 mm Hg; 95% confidence interval, -6.1 to -16.2 mm Hg; P<0.001) and the fruits/vegetables diet (-8.0 mm Hg; 95% confidence interval, -2.5 to -13.4 mm Hg; P<0.01). Overall, blood pressure in the DASH group fell from 146/85 to 134/82 mm Hg. Similar results were observed with 24-hour ambulatory blood pressure measurements. In the DASH diet group, 18 of 23 participants (78%) reduced their systolic blood pressure to <140 mm Hg, compared with 24% and 50% in the control and fruits/vegetables groups, respectively. Results indicated that, the DASH diet, which is rich in fruits, vegetables, and low-fat dairy foods, is effective as first-line therapy in stage 1 ISH.<sup>[18]</sup>

"BEST PRACTICES IN HYPERTENSION", The Hypertension Improvement Project, carried out in Cleveland Clinic Medicine Institute, Independence, OH with the objective of raising the awareness of patients regarding hypertension in order to control Blood pressure which is crucial to reducing patients' risk of organ damage and death. Patients had been educated through handouts given at office visits and through 'community health talks' on hypertension by the organization's primary care physicians. Registered

nurses (RN) offered dietary and lifestyle counselling at RN blood pressure check visits, as well as reinforcing blood pressure goals and medication information. Dieticians are available by physician referral at many of the Family Health Centers. The clinical staff was encouraged to talk to patients about the importance of controlling their high blood pressure. A brief, easy-to-read patient education flyer was given to patients to read while they wait for the physician. A longer, more-detailed patient education handout is given to the patient to take home. The handouts can be printed by clicking on a readily accessible link on the EMR. Every patient was given an 'After Visit Summary sheet' at the end of their visit, which includes vital signs, medication list, and follow-up instructions. When a patient's medications have been adjusted, Cleveland Clinic advises the patient to schedule a follow-up appointment with the physician or a nurse within a two- to four-week timeframe for assessment of the response to the medication and determination of whether further adjustments were needed. These frequent visits should keep occurring until optimal blood pressure control was achieved. Once optimal control was achieved, hypertensive patients should be evaluated in the office a minimum of two times per year. Result of the project was over a period of 2 year patients' compliance was improved from 61% to 72 %.<sup>[19]</sup>

The Heart & Stroke Hypertension Management Program demonstrates that an evidence-informed inter-professional primary healthcare provider educational intervention can successfully integrate into the practice of primary care clinicians to improve the management and control of hypertension in their patients. More than 3,600 patients participated in the Canadian study and blood pressure fell quickly. Remarkably after three years, patients with a diagnosis of hypertension had sustained average blood pressure reductions of 6.4/3.8 mmHg. Even modest reductions in blood pressure can dramatically decrease the incidence of cardiovascular disease. This study showed us that in hypertension, a simple inexpensive education intervention can lead to the sustained achievement of blood pressure control for at least three years.<sup>[20]</sup>

**Conclusion and Recommendations:** Significant improvement in awareness and hypertensive status of patients was seen after health intervention. Thus, people have to be educated through mass media on hypertension and its risk factors. The health workers have to play part by educating the people and also themselves being an example in avoiding the risk factors for hypertension like consumption of fatty food, alcohol and smoking. People have to be educated on the importance of physical exercises and have to be encouraged to do them.

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