

## Original Article

# Assessment of knowledge on the disease, its complications and management strategies among hypertensive patients attending medical clinics at Teaching Hospital, Batticaloa, Sri Lanka

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### Abstract

#### Background

Hypertension is an important public health challenge and is a major risk factor for many other diseases. Lack of knowledge on the dangers of untreated hypertension, the benefits of better control and poor management practices are barriers for effective hypertensive care.

#### Objective

The aim of the study was to describe the level of knowledge on the disease, its complications and management strategies among hypertensive patients attending Medical Clinics at Teaching Hospital, Batticaloa, Sri Lanka.

#### Methods

A cross-sectional descriptive study was conducted among 424 patients diagnosed with 'essential hypertension' attending medical clinics. A pre-tested interviewer administered questionnaire was used for data collection. Data was analyzed using SPSS version 15. A scoring system was used to assess the overall knowledge of the participants.

#### Results

The study population consisted of 174(41%) males and 250(59%) females. Nearly 43% stated that blood pressure of 120/80mmHg was normal. Only 3.3% were aware that hypertension may be asymptomatic. The main aggravating factors for hypertension identified by participants were stress (59.2%) and high salt intake (50.9%). Organs damaged by poorly controlled hypertension were identified as the heart (50%) and kidneys (26%). Sixty four percent said that both medication and lifestyle modifications are useful to control hypertension. Blood pressure lowering strategies identified were reducing body weight (76.0%) and salt reduction (81.1%). Only 45.0% agreed that increased consumption of fruits and vegetables improves control of hypertension. A minority (2.4%) were unsure of non-pharmacological management strategies. Overall knowledge score was inadequate (<50%) among 391(92%), with a mean of 30.8% (SD ± 15.5) ranging from 4.4 – 89.1%.

#### Conclusions

Inadequate knowledge on hypertension, its complications and management strategies was seen. Targeted health education strategies are urgently needed to improve knowledge to prevent consequences of poorly controlled hypertension.

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## Introduction

Chronic non-communicable diseases (NCDs) are overtaking communicable diseases and currently account for nearly 90% of the disease burden of Sri Lanka<sup>1,2</sup>. The incidence of hospitalization due to diabetes mellitus (DM), hypertension and ischaemic heart disease is increasing in Sri Lanka<sup>3</sup>. One in four adults over 20 years has hypertension with a prevalence of 28.4%<sup>4</sup>. Meanwhile, the number of patients admitted to hospitals due to hypertension was 469.8 cases per 100,000 population and number of deaths was 2.9 per 100,000 population in Sri Lanka in the year 2007<sup>5</sup>.

The barriers to optimum hypertension care and control have been well demonstrated with factors such as lack of knowledge on the dangers of untreated hypertension and benefits of controlling blood pressure, a non-therapeutic patient provider relationship, side effects and complexity of drug regimens, alcohol and illicit drug use, social isolation, cost of care, unemployment<sup>6</sup> and poverty of patients' knowledge, perception, attitudes and life-style practice<sup>7</sup> playing a role.

Increasing awareness of hypertension and more effective treatment of patients is the main focus of primary prevention of cardiovascular diseases<sup>8</sup>. Although many studies have been conducted worldwide, only a few studies have been published on risk factors for poor control among hypertensive patients in Sri Lanka. According to Heymann et al., it has been suggested that patients' knowledge on hypertension and its management as well as physician counseling on a healthy lifestyle and self-care have an independent effect on hypertensive patients' compliance with the recommended lifestyle behaviors<sup>9</sup>. Meanwhile, factors associated with poor control of hypertension are modifiable through tailored, culturally appropriate patient education and treatment strategies<sup>6,10</sup>.

This study aims to describe the level of knowledge on the disease, its complications and management strategies among hypertensive patients attending medical clinics at Teaching Hospital, Batticaloa.

## Methods

This cross-sectional descriptive study was conducted at the medical clinics of Teaching Hospital, Batticaloa, Sri Lanka, where approximately 200 patients with hypertension attend clinics from 8am to 4pm daily, except on weekends. Patients both male and female, over the age of 18 years, with a diagnosis of 'essential' hypertension' who are being followed up at the medical clinics were included. Patients who were critically ill, semiconscious or cognitively impaired were excluded.

The maximum sample size was obtained for a given margin of error (d) 0.05 with the prevalence of any of the characteristics taken as 50% and expected proportion of hypertensive patients with good knowledge taken as 0.5, in the absence of similar studies in the local setting. The calculated sample size was 384 and this number was inflated by another 10% to account for non-respondents. Thus, the final sample size was 424. A systematic sampling technique was used to select the study sample from the clinic attendees at each clinic session. The study period was 2 years from January 2014 to December 2015.

A pretested, predesigned interviewer administered questionnaire based on an extensive literature review of similar studies was used. Blood pressure measurements, recorded by the Medical Officer at the clinic on the day of interview, were taken from the clinic records. Informed written consent from participants was obtained prior to the study. Anonymity and confidentiality of the information were maintained and accessibility to all the data collected was limited to the investigators. Ethics clearance was obtained from the Ethics Review Committee, Faculty of Health Care Sciences, Eastern University, Sri Lanka, prior to the commencement of the study.

Statistical Package for Social Sciences (SPSS) software 15 was used for entering data after double checking by the investigator. Descriptive statistics were applied to obtain percentages and means. A score of "one" was given for every correct answer and a score of "zero" for every wrong answer. The total score was converted into percentages and interpreted as follows<sup>11</sup>.

Good/adequate Knowledge	>75-100%
Moderate Knowledge	50-75%
Poor /Inadequate Knowledge	<50%

Level of knowledge was cross tabulated with personal characteristics and the differences were assessed for statistical significance using the chi square test. A p value < 0.05 was considered as significant.

## Results

### Sociodemographic characteristics

Total of 424 hypertensive patients consisted of 174 (41.0%) males and 250 (59.0%) females. Majority(71.4%) were in the 51-70 years age group. The mean age of participants was 60.4 years (SD± 9.6), [(61.2 ± 9.1) years for men and (59.8 ± 9.8) years for women].

Nearly half the participants (47.6%) were either unemployed or unskilled and 61.3% had studied up to the GCE Ordinary Level examination. Majority (91.3%) were living with extended family. Forty six percent had hypertension for a duration of 1 to 5 years. Fifty seven percent said that their source of information on hypertension was from the clinics (health care provider) while 2% had obtained information from friends or relatives.

The recorded systolic blood pressure (SBP) ranged from 100-200 mmHg while diastolic blood pressure (DBP) ranged from 70-100 mmHg and the mean values were 132.9mmHg (SD=12.7 mmHg) and 83.40mmHg (SD=6.5 mmHg) respectively.

The socio- demographics details are given in Table 1.

**Table 1: Socio-demographic characteristics of participants by sex**

Characteristic	Response	Male n (%)	Female n (%)	Total n (%)
<b>Gender</b>		174 (41.0)	250 (59.0)	424 (100.0)
<b>Age group (years)</b>	≤ 30	0 (0.0)	1 (0.4)	1 (0.2)
	31 - 50	28 (16.1)	39 (15.7)	67 (15.8)
	51 - 70	122 (70.1)	181 (72.7)	303 (71.4)
	71 - 90	24 (13.8)	28 (11.2)	52 (12.3)
<b>Ethnic Background</b>	Tamil	134 (77.0)	204 (81.6)	338 (79.7)
	Muslim	24 (13.8)	20 (8.0)	44 (10.4)
	Burger	16 (9.2)	26 (10.4)	42 (9.9)
<b>Educational level</b>	Never attend to School	34 (19.5)	93 (37.2)	127 (30.0)
	Up to GCE (O/L)	119 (68.4)	141 (56.4)	260 (61.3)
	Up to GCE (A/L)	16 (9.2)	15 (6.0)	31 (7.3)
	Diploma/Degree	4 (2.3)	1 (0.4)	5 (1.2)
	Postgraduate	1 (0.6)	0 (0.0)	1 (0.2)
<b>Monthly income (LKR)</b>	< 10,000	72 (41.4)	156 (62.4)	228 (53.8)
	10,000 – 24,999	74 (42.5)	74 (29.6)	148 (34.9)
	25,000 – 39,999	20 (11.5)	18 (7.2)	38 (9.0)
	≥ 40,000	8 (4.6)	2 (0.8)	10 (2.3)
<b>Marital status</b>	Single	6 (3.4)	16 (6.4)	22 (5.2)
	Married	161 (92.6)	192 (76.8)	353 (83.3)
	Divorced/Separated	2 (1.1)	2 (0.8)	4 (0.9)
	Widowed	5 (2.9)	40 (16.0)	45 (10.6)
<b>Duration of hypertension (years)</b>	< 1	12 (6.8)	23 (9.2)	35 (8.3)
	1 - 5	77 (44.3)	117 (46.8)	194 (45.7)
	6 - 10	49 (28.2)	48 (19.2)	97 (22.9)
	> 10	36 (20.7)	62 (24.8)	98 (23.1)

#### Knowledge on hypertension and consequences of poorly controlled hypertension

Around 42.7% stated that 120/80mmHg was the normal blood pressure while only 22.9% knew that blood pressure more than 140/90mmHg is hypertension. Approximately 47.0% stated that excessive stress was a common cause for hypertension. Seventy two percent stated that headache is the main symptom of hypertension. Only 3.3% knew that hypertension can be an asymptomatic condition. In addition, stress and high salt intake were stated as the main aggravating factors for hypertension by 59.2% and 50.9% respectively (Table 2).

Organs damaged by poorly controlled hypertension were identified as the heart (50%), kidneys (26%), nervous system and eyes. The majority (52.1%) believed that poorly controlled hypertension leads to "heart attack" (myocardial infarction) (Table 3).

**Table 2: Responses of participants to the questions assessing knowledge on the disease hypertension**

Characteristic	Response	N (%)
Normal BP measurement	Accurately stated	181 (42.7)
	Not accurately stated	243 (57.3)
Hypertension means (BP > 140/90mmHg)	Known	97 (22.9)
	Unknown	327 (87.1)
Causes for hypertension	Hereditary	92 (21.7)
	Excessive stress	200 (47.2)
	Bad food habit	150 (35.4)
	Certain drugs	14 (3.3)
Symptoms	Headache	304 (71.7)
	Restlessness	214 (50.5)
	Symptomless	14 (3.3)
	Blurred vision	18 (4.2)
Aggravating factors	Smoking	105 (24.8)
	Alcohol	90 (21.2)
	High salt intake	216 (50.9)
	Diabetes Mellitus	71 (16.7)
	Obesity	94 (22.2)
	Male gender	6 (1.4)
	Stress	251 (59.2)
	Ageing	48 (11.3)
	Family history	47 (11.1)
	Physical inactivity	26 (6.1)
Bad diet habits	4 (0.9)	

BP= Blood pressure

**Table 3: Responses of participants to the questions assessing knowledge on consequences of poorly controlled hypertension**

Characteristic	Response	Total N (%)
* Organs affected by hypertension	Heart	211 (49.8)
	Kidney	112 (26.4)
	Vasculature	43 (10.1)
	Nervous system	113 (26.7)
	Eyes	107 (25.2)
* Complications of hypertension	MI	221 (52.1)
	Enlarged heart	28 (6.6)
	Visual impairment	121 (28.5)
	Stroke	196 (46.2)
	CVD	45 (10.6)
	Poor renal function	49 (11.6)

\* Multiple responses were allowed

### Knowledge on management of hypertension

Sixty four percent said that tablets and lifestyle modifications (exercise and diet therapy) are useful strategies for treating hypertension. Around 2.4% participants were not sure of any treatment methods while around 46.0% stated that investigation of lipid profile is done to assess the improvement of hypertension (Table 4).

**Table 4: Responses of participants to the questions assessing knowledge on management of hypertension**

Details	Response	Total N (%)
Treatment method	Tablets only	122 (28.8)
	Lifestyle modification only	21 (5.0)
	Both	271 (63.8)
	Not sure	10 (2.4)
*Investigations done	Lipid profile	194 (45.8)
	Renal function test	51 (12.0)
	Urine analysis	108 (25.5)
	Liver function test	9 (2.1)
	ECG	74 (17.5)
	ECHO	2 (0.5)

\* Several responses were given by participants. Therefore, percentage was calculated on total participants. ECG- Electrocardiogram

Blood pressure lowering strategies identified were reducing body weight in overweight individuals (76.0%) and salt reduction (81.1%). Around 45.0% mentioned that stopping smoking, restriction of alcohol, regular physical activity and increase consumption of fruits, vegetables and low fat dairy products are methods use to manage hypertension. Twenty four percent of participants stated incorrectly that people with hypertension do not need to take medicine if they are exercising regularly (Table 5).

**Tables 5: Distributions of the study participants by the statements on lifestyle modification to manage hypertension**

Statements	Total N (%)
Weight reduction in overweight individuals is needed	321 (75.7)
Reduction in salt intake is useful	344 (81.1)
Need to stop smoking	203 (47.9)
Restriction of alcohol consumption is important	199 (46.9)
Regular physical activity is needed in sedentary individuals	193 (45.5)
Increase consumption of fruits, vegetables and low fat dairy products	191 (45.0)
High blood pressure can be reduced by making changes in your diet	172 (40.6)
Regular blood pressure checkup is necessary	202(47.6)
People with hypertension do not need to take medicine if they exercise regularly*	101 (23.8)

\* This statement is incorrect.

**Overall knowledge score on the disease, its consequences and management practices**

Ninety two percent (92.2%) of participants had an inadequate knowledge score (<50%) on hypertension [mean of 30.8% (SD = 15.5%), range from 4.4 – 89.1%]. Knowledge score obtained by male and female participants is shown in table 6.

**Table 6 – Distribution of participants by the overall knowledge score and sex**

Score level	Male N (%)	Female N (%)	Total N (%)
Inadequate knowledge (< 50%)	155(89.1)	236 (94.4)	391(92.2)
Moderate knowledge (50-75%)	12 (6.9)	10 (4.0)	22 (5.2)
Good knowledge (>75%)	7 (4.0)	4 (1.6)	11 (2.6)

**Discussion**

There were more females than males in this study population. Similar findings have been reported<sup>7</sup>. In addition, most participants were in the age group of 51-70 years, in unskilled employment and with educational qualification up to GCE O/L. Similar data was reported by Mahajan et al. in Mumbai, India<sup>12</sup>. Majority of participants were living with extended family and similar finding was reported in another study<sup>13</sup>. Living with extended family may lead to exposure and reinforcement of traditional and potentially unhealthy health practices and beliefs<sup>14</sup> which play an important negative role in the control of hypertension.

In this study, more than half of the participants received information about hypertension from their clinics which provides an opportunity to influence patient knowledge, awareness and attitude towards hypertension control. This may be from the ongoing health education programme conducted by health educators during clinic hours. A study by Oliveria et al. in USA highlighted similar findings that the health care providers were important sources of information<sup>15</sup>. In contrast, Kjellgren et al. reported that the mass media was identified as a major source of information<sup>16</sup>.

The majority of patients were not aware of the normal range of blood pressure. Similar findings have been reported, where many patients had not known the ideal blood pressure value and almost half were not aware of their own blood pressure or able to express the correct categories of high blood pressure measurements<sup>15</sup>. In contrast, a study done in North Carolina, USA among known hypertensive patients had revealed that only a small percentage did not know the correct value or were not sure that BP > 140/90 mmHg is hypertension<sup>17</sup>.

Headache and restlessness were symptoms of hypertension identified by many participants while only a few were aware of the asymptomatic nature of the disease. Similar observations was made in a study carried out in a public health care center in Iran, where only about one in ten patients were aware that hypertension is a disease that may be asymptomatic<sup>18</sup>. Similarly, in a study among hypertensive patients in a

suburban Nigerian community, most hypertensive patients were unaware of the symptomless nature of the disease<sup>7</sup>. This may have contributed to their negative attitude to treatment, high non-adherence to treatment plan and poor life-style and dietary habits.

In this study, the majority of participants identified myocardial infarction as a common complication of hypertension and that the heart is the most affected organ. Similarly, in a study in the USA, nearly 90% of hypertensive patients knew that high blood pressure could lead to heart problems and most were aware that hypertension could cause ischaemic heart disease<sup>15</sup>. In addition, most of the participants believed that stress, high salt intake and smoking were aggravating factors for hypertension. This was also evident in a study in the Seychelles Islands where most patients believed that a salty diet, obesity, smoking and physical inactivity were important aggravating factors in hypertension<sup>19</sup>. However, in our study only a few identified that physical inactivity aggravates hypertension.

The overall knowledge on the disease, its complications and management strategies among the participants was inadequate. Similar results were reported in studies in Mumbai, India<sup>12</sup>, where the majority of patients had poor scores in the knowledge, attitude and practice of hypertension<sup>20</sup>. Similarly hypertensive patients had inadequate knowledge and awareness about the disease in a study carried out in California, USA<sup>21</sup>. But, in contrast, a study conducted in the National Hospital of Sri Lanka found that patients' knowledge regarding many aspects of aetiology, complications and management of hypertension was satisfactory<sup>22</sup>. A study by Victor et al. in Texas, USA highlighted that most patients had a high degree of awareness about hypertension<sup>23</sup>. Further, a study conducted by Oliveria et al. suggested that patients are knowledgeable about hypertension in general, but are less knowledgeable about specific factors related to their condition, and specifically their own level of BP control<sup>16</sup>. In this study, low scores of knowledge may be due to lack of interest, poor literacy and low income and due to unavailability of appropriate information on hypertension and its complications. A statistical significant relationship was seen between the knowledge score and educational level of the participants of this study. This result is consistent with a study at the National Hospital of Sri Lanka where patients with a higher education level had better knowledge regarding risk factors, complications and management of hypertension<sup>22</sup>. This emphasizes the importance of education in prevention and management of this non-communicable disease.

### **Conclusions and recommendations**

Patients with hypertension had inadequate knowledge on the disease, its complications and management strategies. Knowledge on salt intake, tobacco consumption, body weight maintenance and fruits and vegetable consumptions was particularly low. Health care providers need to deliver appropriate knowledge to patients with hypertension on control measures, adverse consequences of hypertension and management strategies.



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