

## Frequency and Causes of Non-adherence to Non-pharmacological Management of Hypertensive Patient

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### Abstract

**Background:** Uncontrolled hypertension is the precursor of complications like cardiovascular diseases, stroke, chronic kidney disease and peripheral vascular disease. Non-adherence to the non-pharmacological measures is one of the important causes of uncontrolled hypertension.

**Subjects and Methods:** This was a cross sectional study, carried out in Hypertension and Research Center Rangpur, Bangladesh. On an average about 30 patient visit to Hypertension and Research Center, Rangpur daily. From the daily visited patients every 3rd patient was included in this study.

**Results:** In this study, we have studied a total of 209 patients of both sexes. Mean age of the patients were  $50.71 \pm 11.71$  years. Male were more than female (53.1 years vs 46.9 years). At the time of diagnosis of hypertension 13.9% patients were smoker, 33% used to take smokeless tobacco and 47.8% patients used to take added salt during meal. Adherence to smoking was 44.82%, smokeless tobacco 59.42%, daily exercise for 30 minutes 63.63% and 88% in added salt intake with meal. Blood pressure was control in 16.3% patients at the time of the enrollment in our center and increased to 58.4% at the time of our study. 56% patients were in regular follow up and 82.8% patients used to take drug regularly.

**Conclusion:** Adherence to non-pharmacological measures was not satisfactory; ignorance of the patient and poor counseling was the major cause of non-adherent.

**Keywords:** Adherence; Hypertension; Non-pharmacological; Rangpur

### Introduction

Hypertension is considered a chronic Non-Communicable Disease (NCD) and an independent and modifiable risk factor for cardiovascular and renal diseases. Hypertension is responsible for 13.5% of all deaths in the world, representing a severe public health problem because of its high prevalence, low control rate, and high economic and social costs [1,2]. Hypertension is the most important risk factor

for heart diseases and stroke, and responsible for about 50% of the deaths caused by these diseases. The aim of treatment is to keep the patient's blood pressure within the ideal limits, to prevent complications [3,4]. Study from Bangladesh has shown that majority (71.2%) of the hypertensive patients died due to hypertension related complications (detected from verbal autopsy); 33.3% due to stroke, 20.3% CAD and 17.8% chronic kidney disease [5]. In the literature, keeping the blood pressure within the ideal limits has been indicated to reduce stroke risk approximately by 38%, congestive heart failure risk by 42% and coronary heart disease risk by 28% [6]. Adherence to hypertension treatment is defined by the World Health Organization (WHO) as the degree to which the behavior of an individual corresponds to and agrees with the therapeutic recommendations made by a health professional [7]. Behavioral risk factors constitute the main targets of hypertension prevention and treatment because when corrected, they effectively reduce blood pressure and its complications. The main non-pharmacological recommendations to prevent primary hypertension are: losing weight, reducing salt and alcohol intakes, quitting smoking, practicing physical activity regularly, and eating healthy [1,8,9]. Appropriate lifestyle modifications can have a hypertensive effect comparable to that seen with single-agent pharmacological treatment [10]. Appropriate lifestyle changes may reduce BP in patients who are already treated pharmaceutically, which in turn allows for reducing the dosage of hypertensive drugs [11].

The results of the Trial of Non-pharmacologic Interventions in the Elderly (TONE) indicate that in compliant patients, including the elderly, weight loss and sodium restriction bring about satisfactory decreases in BP [12,13]. The BP drop in response to sodium-restricted diet is particularly marked in the elderly, in diabetic patients, and in patients with chronic kidney disease [14,15]. According to the World Health Organization (WHO), the main factor contributing to the failure of keeping blood pressure within the ideal limits is the non-adherence to pharmacological and non-pharmacological treatment methods [4,16]. Several studies conducted in countries such as China, Taiwan, Ethiopia and India to assess patients' adherence to medication treatment by using different methods report that adherence rates vary between 48% and 86%, and that non-adherence both to pharmacological and to non-pharmacological treatment methods is the most important obstacle to blood pressure control [17-23]. A marked increase in prevalence of hypertension (from 11.3% to 17.9%) was observed in Bangladesh from 1999 to 2010 [24,25]. In Rangpur division (Northern part) of Bangladesh prevalence of hypertension and pre-hypertension is 33.3% and 29.9% respectively and blood pressure was controlled in 36.06% [26]. One of the causes of poor control of hypertension is non-adherence to non-pharmacological measures.

Therefore, this study was carried out to identify the adherence to non-pharmacological management and the causes of non-adherence.

### Populations and Methods

This was a cross sectional study, carried out in Hypertension and Research Center Rangpur, Bangladesh from 12/06/2017 to 11/09/2017. On an average about 30 patients visit to Hypertension and Research Center, Rangpur for follow up daily. From the daily visited follow up patients every 3<sup>rd</sup> patient was taken to generate the study sample. The first patient was chosen randomly from hypertensive patients 1 to 10. The patients who visited the center for the 1<sup>st</sup> time, diagnosed as secondary hypertension, getting treatment of hypertension for less than 3 months, who were too ill/unable to answer the questionnaire and patients who did not consent were excluded from the study.

### Data collection

An informed consent was obtained before enrollment in this study. The following data were collected; socio-demographic details, duration of disease, adherence to the component of non-pharmacological measures, medication history, risk factors, complications and other co morbidities. The antihypertensive drugs currently used by the patients were recorded according to their classes and drugs used for other co-morbidities were also documented. Patients' compliance to treatment was also evaluated.

**Statistical analysis**

Data analysis was done according to the objectives of the study by using SPSS-17.0 (Statistical Program for Social Science) software program. The result of the clinical study and statistical analysis is presented in the form of text, table, bar and chart.

**Ethics statement**

Before the commencement of the study, formal ethical approval was obtained from the Ethical Review Committee (ERC) of Hypertension and Research Center, Rangpur, Bangladesh. All methods were performed in accordance with the current Declaration of Helsinki. All participants gave informed written consent before participation.

**Results**

In this study, we have studied a total of 209 patients of both sexes. Mean age of the patients were 50.71 years. Male were more than female (53.1 years vs 46.9 years). Table 1 shows the socio-demographic characteristics of the patients.

Variables	Frequency	Percentage (%)
Mean age	50.71 years (SD 11.71) (age range 25 - 83 years)	
<b>Sex</b>		
Male	111	53.1%
Female	98	46.9%
<b>Residence</b>		
Rural	119	56.9%
Urban	90	43.1%
<b>Level of education</b>		
Illiterate	37	17.7%
< 5 class	58	27.8%
5 - < 10 class	50	23.9%
> 10	20	9.6%
Graduate and above	44	21.1%
<b>Occupation</b>		
Service	50	31.3%
Business	38	13.8%
Agriculture	16	12.5%
Retired	12	4.7%
Housewife	93	36.2%
<b>Monthly income</b>		
< 5000 taka*	91	43.5%
5000 - < 10000 taka	62	29.7%
10000 - < 15000 taka	33	15.8%
> 15000 taka	23	11%

**Table 1:** Socio-demographic characteristics of the study population (n = 209).

1 USD = 88 BDT.

Duration of hypertension among the patient was 5.75 years. Family history of hypertension was present in 61.72% patients. Only 8.6% had sedentary lifestyle, among the woman 28.57% used contraceptive method; among them 42.85% used hormonal contraceptive mean duration was 4.76 years.

At the time of diagnosis of hypertension 13.9% patients were smoker for duration of 14.55 years (average) and 47.8% patients used to take added salt during meal. Table 2 showing details.

Risk factor	Percentage/Frequency
Smoking	13.9% (29)
Smokeless tobacco	33% (69)
No daily exercise (30 minutes walking)	78.9% (165)
History if taking added salt	47.8% (100)
Overweight	41.1% (86)
Obese	6.2% (13)
Central obesity	100% (209)

**Table 2:** Risk factor of hypertension at the time of diagnosis.

After the diagnosis of hypertension only 44.82% gave up smoking and 59.42% smokeless tobacco, 63.63% patient started daily exercise for 30 minutes, 88% stopped taking added salt in meal and newly 6.3% overweight and 1.9% obese patients added.

Risk factor	Percentage/Frequency
Smoking	7.7% (16)
Smokeless tobacco	13.4% (28)
No daily exercise (30 minutes walking)	30.1% (60)
History of taking added salt	5.7% (12)
<b>Fatty foods</b>	
Regular	14.4% (30)
Occasional	50.7% (106)
<b>Vegetables intake</b>	
Regular	78% (163)
Occasional	14.4% (30)
No	7.7% (16)
Overweight	47.4% (99)
Obese	8.1% (17)
Central obesity	100%

**Table 3:** Risk factor of hypertension at the time of the study.

Ignorance of the patient and poor counseling 33.75% about the non-pharmacological management was the major cause of non-adherent. Table 4 showing the causes of non-adherence to non-pharmacological management.

Ignorance	31.84% (50)
Poor counseling	26.75% (42)
Ignorance and poor counseling	33.75% (53)
Do not find time	5.09% (8)
Others	2.54% (4)

**Table 4:** Causes of non-adherence to non-pharmacological management.

At the time of diagnosis mean BP was 160/95.76 mm of Hg and at the time of this study was 138.39/86.91 mm of Hg. Blood pressure was control in 16.3% patients at the time of the enrollment in our center and increased to 58.4% at the time of our study. 56% patients were in regular follow up and 82.8% patients used to take drug regularly.

### Discussion

In several countries of the world it has become a serious challenge for public health policies of poor adherence to non-pharmacological treatment of hypertension [9]. In this present study, the aim was to identify the frequency of non-adherence to non-pharmacological management of hypertension and causal relationship of the factors towards the occurrence. Rates of adherence to non-pharmacological treatment methods were well below the desired level, the rate of adherence to smoking cessation was between 18% and 83%, to diet was between 36% and 69% and to physical activity was between 23% and 36% [22,27-30]. In our study adherence to daily exercise was 63.63% patients and smoking cessation was found 44.82%. The rate of adherence to smoking cessation are reported to be high in the advanced age and unemployed participants in the literature, in this literature the researcher correlated the ‘advanced age’ of the unemployed people for their smoking cessation behavior. In addition, the rate of adherence to smoking cessation was high in the participants who perceived their health as bad. This can be explained by the fact that the participants who perceived their health as bad suffered from death anxiety more [31]. In our study we did not find any co-relation of smoking cessation with advance age and complications of hypertension.

We found higher frequency for vegetable intake on a daily basis about 78% of the patients vs only 14.4% for fast foods. Adherence to dietary modification was found 55.7% in another study [32]. In the study of Iran from cultural and lifestyle background; the participants mentioned that cultural factors such as dietary habits, the internalization of health behaviors in childhood and urban life considerably influence adherence to treatment, specifically non-pharmacological treatment [33]. The most prevalent cause in our study for the non-adherence we found; is the ignorance and poor counseling of the patients which accounted for 33.75% among all the factors. Similar finding was found in a study done in Iran where author mentioned the shortage of sufficient knowledge about the nature of disease, symptoms, complications and treatment method as well as wrong beliefs towards them tend to be the significant factors for non-adherence to treatment [9]. The systemic review that has studied causes in 16 countries showed that ignorance of the causes and symptoms can lead to intentional discontinuation of treatment by patients [33]. Interestingly for both pharmacological and non-pharmacological management in patients with hypertension revealed that the gender of the patients, marital status, the education level of the patients and their spouse did not affect the patients’ follow up from the therapeutic instructions provided to the patients [34]. Also in a study in Turkey rates of adherence to non-pharmacological treatment methods were below to the desired level in the studies conducted in this issue [35].

Salt intake is high among the population of this area. In a study 50.1% patients used to take extra salt during meal and among the hypertensive patients 24.28% used to take extra salt [26]. It is worth noting that in this study after diagnosed with hypertension the participants started decreased consumption of salt for about 88%. One of the recognized causes of the occurrence and intensification of blood

pressure is the amount of salt consumed [37]. In spite of being the recognizable cause of HTN and opposite to our finding, a study of Iran revealed that the consumption of a large amount of salt as part of the culture and food habits makes it difficult to adhere to a proper diet and follow it at home and other environments, such as restaurants and canteens [37].

Moreover, another study indicates that incongruity between people's food culture and useful regimens for hypertension and low-salt diets makes it difficult for patients to adhere to treatment [38]. In our study we found the improvement of medication adherence to the patients after diagnosing hypertension to 82.8%. But in literatures it has been shown that 50% of patients with hypertension discontinue their medications within the first 12 months after the beginning of treatment [39]. Some studies established the negative correlation between sociodemographic and clinical factors to the adherence to the therapeutic guidelines. Medication adherence rates have been shown to be related to age, gender, race, geographical region of residence, and illness perceptions [40-42].

The control of hypertension in many studies [25,26] ranges from 17.6% to 36.06% in Bangladesh. Suboptimal blood pressure control reported from developed western countries [43-45]. In our study blood pressure was controlled in 58.4%. We did not find any significant co-relation with uncontrolled blood pressure with non-adherence to non-pharmacological measures. Uncontrolled blood pressure raises the possibility of development of target organ damage. Therefore, to prevent complications of hypertension effective control of blood pressure is mandatory.

### Conclusion

Adherence to non-pharmacological measures was not satisfactory; ignorance of the patient and poor counseling was the major cause of non-adherent.

### Limitation

Sample size was small, details co-relation of non-adherence with patient and physician related factors was not studied.

### Future Direction

Community based study with large sample size will be needed to determine the prevalence of non-adherence to non-pharmacological measures.

### Conflict of Interest

There was no conflict of interest.

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### Bibliography

1. Sociedade Brasileira de Cardiologia, Sociedade Brasileira de Hipertensão, Sociedade Brasileira de Nefrologia. VI Diretrizes Brasileiras de Hipertensão. *Arquivos Brasileiros de Cardiologia* 95 (2010): 1-51.
2. Goulart FAA. "Doenças crônicas não transmissíveis: estratégias de controle e desafios e para os sistemas de saúde". Brasília: Ministério Saúde (2011).
3. World Health Organization. "A Global Brief of Hypertension". Switzerland: WHO Books (2013): 39.

4. James PA, *et al.* "Evidence-Based Guideline for the Management of High Blood Pressure in Adults: Report From the Panel Members Appointed to the Eighth Joint National Committee (JNC 8)". *JAMA* 311.5 (2014): 507-520.
5. Mondal RN, *et al.* "Validity of verbal autopsy questionnaire for assessment of causes of death among patients with hypertension". *World Heart Journal* 6 (2014): 107-116.
6. Roberie DR and Elliott WJ. "What is the prevalence of resistant hypertension in the United States?" *Current Opinion Cardiology* 27.4 (2012): 386-391.
7. World Health Organization 2008-2013 action plan for the global strategy for the prevention and control of noncommunicable diseases: Prevention and control cardiovascular diseases, cancers, chronic respiratory diseases and diabetes. Geneva: WHO (2008).
8. Brasil. Ministério da Saúde. Secretaria de Vigilância em Saúde. Plano de ações estratégicas para o enfrentamento das Doenças Crônicas Não Transmissíveis (DCNT) no Brasil 2011-2022. Brasília: Ministério da Saúde (2011).
9. Ribeiro AG, *et al.* "Non pharmacological treatment of hypertension in primary health care: A comparative clinical trial of two education strategies in health and nutrition". *BMC Public Health* 11 (2011): 637.
10. Huisman M, *et al.* "Inequalities in the prevalence of smoking in the European Union: comparing education and income". *Preventive Medicine* 40 (2005): 756-764.
11. Frisoli TM, *et al.* "Beyond salt: lifestyle modifications and blood pressure". *European Heart Journal* 32 (2011): 3081-3087.
12. Dickinson HO, *et al.* "Lifestyle interventions to reduce raised blood pressure: a systematic review of randomized controlled trials". *Journal of Hypertension* 24 (2006): 215-233.
13. Kostis JB, *et al.* "Does withdrawal of antihypertensive medication increase the risk of cardiovascular events? Trial of Nonpharmacologic Interventions in the Elderly (TONE) Cooperative Research Group". *American Journal of Cardiology* 82 (1998): 1501-1508.
14. He FJ, *et al.* "Importance of the renin system for determining blood pressure fall with acute salt restriction in hypertensive and normotensive whites". *Hypertension* 38 (2001): 321-325.
15. Kostis JB, *et al.* "Persistence of normotension after discontinuation of lifestyle intervention in the trial of TONE. Trial of Nonpharmacologic Interventions in the Elderly". *American Journal of Hypertension* 15 (2002): 732-734.
16. European Society of Cardiology 2013 AEH/ESC Arterial Hypertension Guidelines. *Turkish Society of Cardiology* 4 (2014): S1-72.
17. Solomon A, *et al.* "Medication Routines and Adherence Among Hypertensive African Americans". *Journal of Clinical Hypertension* 17.9 (2015): 668-672.
18. Lee GKY, *et al.* "Determinants of medication adherence to antihypertensive medications among a Chinese population using Morisky medication adherence scale". *PLoS One* 8.4 (2013): e62775.
19. Li WW, *et al.* "Factors related to medication non-adherence for patients with hypertension in Taiwan". *Journal of Clinical Nursing* 21 (2012): 1816-1824.
20. Hareri HA and Abebe M. "Assessments of Adherence to Hypertension Medications and Associated Factors among Patients Attending Tikur Anbessa Specialized Hospital Renal Unit, Addis Ababa, Ethiopia 2012". *IJNSS* 3.1 (2013): 1-6.
21. Bhandari S, *et al.* "Adherence to Antihypertensive Treatment and Its Determinants among Urban Slum Dwellers in Kolkata, India". *Asia-Pacific Journal of Public Health* 27.2 (2015): 74-84.

22. Uzun S., *et al.* "The assessment of adherence of hypertensive individuals to treatment and lifestyle change recommendations". *Anatolian Journal of Cardiology* 9 (2009): 102-109.
23. Grezzana GB., *et al.* "Blood Pressure and Control Through 24 Hour Ambulatory Monitoring". *Arquivos Brasileiros de Cardiologia* 100.4 (2013): 347-353.
24. MM Zaman and MA Rouf. "Prevalence of hypertension in a Bangladeshi adult population". *Journal of Human Hypertension* 13 (1999): 547-549.
25. NCD risk factor survey 2010 report published and disseminated published on 7<sup>th</sup> August (2011).
26. Mondal RN., *et al.* "Prevalence and Risk Factors of Hypertension in Rangpur, Bangladesh". *World Heart Journal* 5.1 (2013): 91-100.
27. Aypak C., *et al.* "Evaluation of Blood Pressure Control Levels and Treatment Compliances of Hypertensive Patients". *Cukurova Medical Journal* 38.2 (2013): 224-232.
28. Mert H., *et al.* "A Multidisciplinary special study module research: treatment compliance of patients with hypertension". *Turkish Journal of Family Practice* 15.1 (2011): 7-12.
29. Sahin ZA and Bicer N. "Healthy Lifestyle Behaviors of Hypertension Patients". *MN Cardiology* 22.4 (2015): 180-185.
30. Jankowska-Polańska B., *et al.* "The influence of illness acceptance on the adherence to pharmacological and non-pharmacological therapy in patients with hypertension". *European Journal of Cardiovascular Nursing* 15.7 (2016): 559-568.
31. Kyngäs H and Lahdenperä T. "Compliance of patients with hypertension and associated factors". *Journal of Advanced Nursing* 29.4 (1999): 832-839.
32. Selçuk KT., *et al.* "Hypertensive patients' adherence to pharmacological and non-pharmacological treatment methods, in Turkey". *International Journal of Community Medicine and Public Health* 4.8 (2017): 2648-2657.
33. Ashoorkhani M., *et al.* "Understanding Non-Adherence to Treatment in Hypertension: A Qualitative Study". *International Journal of Community Based Nursing and Midwifery* 6.4 (2018): 314-323.
34. Marshall IJ., *et al.* "Lay perspectives on hypertension and drug adherence: systematic review of qualitative research". *BMJ* (2012): 345.
35. Etebari F., *et al.* "Factors related to the non-adherence of medication and nonpharmacological recommendations in high blood pressure patients". *Journal of Cardiovascular and Thoracic Research* 11.1 (2019): 28-34.
36. Brown IJ., *et al.* "Salt intakes around the world: implications for public health". *International Journal of Epidemiology* 38 (2009): 791-813.
37. Nakandakare ER., *et al.* "Dietary salt restriction increases plasma lipoprotein and inflammatory marker concentrations in hypertensive patients". *Atherosclerosis* 200 (2008): 410-416.
38. Bertoni AG., *et al.* "A multilevel assessment of barriers to adoption of Dietary Approaches to Stop Hypertension (DASH) among African Americans of low socioeconomic status". *Journal of Health Care for the Poor and Underserved* 22 (2011): 1205-1220.
39. Jankowska-Polańska B., *et al.* "The influence of illness acceptance on the adherence to pharmacological and non-pharmacological therapy in patients with hypertension". *European Journal of Cardiovascular Nursing* 15.7 (2016).
40. Rajpura J and Nayak R. "Medication adherence in a sample of elderly suffering from hypertension: Evaluating the influence of illness perceptions, treatment beliefs, and illness burden". *Journal of Managed Care and Specialty Pharmacy* 20 (2014): 58-65.

41. Monane M., *et al.* "The effects of initial drug choice and comorbidity on antihypertensive therapy compliance: Results from a population-based study in the elderly". *American Journal of Hypertension* 10 (1997): 697-704.
42. Morris AB., *et al.* "Factors associated with drug adherence and blood pressure control in patients with hypertension". *Pharmacotherapy* 26 (2006): 483-492.
43. Oliveria SA., *et al.* "Physician-related barriers to the effective management of uncontrolled hypertension". *Archives Internal Medicine* 162.4 (2002): 413-420.
44. Berlowitz DR., *et al.* "Inadequate management of blood pressure in a hypertensive population". *The New England Journal of Medicine* 339.27 (1998): 1957-1963.
45. Knight EL., *et al.* "Predictors of uncontrolled hypertension in ambulatory patients". *Hypertension* 38.4 (2001): 809-814.

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