

# Lifestyle Modifications in the Management of Hypertensive Patients in a Secondary Care Center: A Descriptive Cross-sectional Study

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## Abstract:-

**Introduction:** Hypertension is the serious medical condition that significantly increases the risks of heart, brain, kidney and other diseases. This study evaluated the level of understanding of hypertensive patients regarding lifestyle modifications, the level of application of those lifestyle changes in their daily activities and the effect of those lifestyle modification in the management of hypertension. The objective of this research is to describe whether the patients with hypertension adhered lifestyle modifications and provision of follow-up instructions upon initial diagnosis of hypertension in a secondary care centre.

**Methods:** A descriptive cross-sectional study was conducted in outpatient department of secondary care centre from 20<sup>th</sup> September 2021 to 20<sup>th</sup> March 2022. Ethical clearance was taken from Institutional Review Committee (Reference number: 02/2078-79). A simple random sampling was done. Data were collected and entered in Microsoft Excel version 2007 and analyzed using Statistical Package for the Social Science version 25.0.

**Results:** There is changes in blood pressure (BP) across visits ( $P < 0.001$ ). In first visit 94% patients had BP > 140/90 however in first and second follow up the BP between 120/80 and 140/90 are 86.8% and 98% respectively. After following lifestyle modifications changes, there is changes in weight across visits ( $P < 0.001$ ).

**Conclusions:** Our study about lifestyle modifications in the management of hypertension was similar when compared to other studies conducted in similar settings. On time education and information about exercise, weight loss, less salt intake, less alcohol and cigarette consumption plays an important role in management of hypertensive patients and reduce future risk.

**Keywords:-** Hypertension; Blood Pressure; Outpatient Department; Lifestyle Modification

## I. INTRODUCTION

Hypertension is a serious medical condition which is responsible for more than half of all strokes and coronary disease.<sup>1</sup> Around 1.28 billion people around the globe are suffering form hypertension.<sup>2</sup> Hypertension is more alarming in low- and middle-income countries especially Nepal.<sup>1</sup> Bardiya is in mid-western part of Nepal where most people with low socio-economic condition. The number of strokes and coronary disease patients are increase in Bardiya like everyday due to hypertension. On-time detection, evaluation and treatment of hypertension will minimize strokes and coronary disease, and reduces its severity, morbidity, and mortality.

The objective of this research is to describe whether patients with hypertension follows lifestyle modifications and provision of follow-up instructions upon initial diagnosis of hypertension in a outpatient patient department (OPD) of Bardiya Hospital, mid-western Nepal.

## II. METHODS

A descriptive cross-sectional study was conducted in Bardiya Hospital, a secondary care centre from 20<sup>th</sup> September 2021 to 20<sup>th</sup> March 2022. Ethical clearance was taken from Institutional Review Committee (Reference number: 02/2078-79). A simple random sampling was done. Patients from age 18 to 60 years were included and divided into five groups, the age groups from 16-25, 26-35, 36-45, 46-55 and 56-65 with the blood pressure (BP) of >140/90 presented in the outpatient were eligible for this study. We considered patients with systolic blood pressure (SBP)  $\geq 140$  mmHg or diastolic blood pressure (DBP)  $\geq 90$  mmHg as hypertensive. Inclusion Criteria includes: 1. Patients in between 16-65 years of age with blood pressure more than 140/90 mm of Hg presenting to OPD 2. Patients who were able to answer the questions verbally on its own 3. Patients having systolic hypertension 4. Both sex 5. Cooperative, willing to participate in the study. Exclusion Criteria includes: 1. Patient having Target organ damage or Diabetes 2. Patient having Congestive heart Failure, Angina 3. Patient having other life threatening co-morbidity like Carcinoma, Terminal Liver or Renal Failure 4. Patient who have disability that would prevent participation in a walking regime 5. Not

well enough to answer 6.Unwilling to Participate  
7.Pregnancy with hypertension.

All patients either previously diagnosed as a hypertensive or newly diagnosed case of hypertension were interviewed about what they know about the lifestyle modification with a questionnaire. All the participants whether newly diagnosed or previously diagnosed were told once again about the lifestyle modification and include dietary changes, exercises, sodium restriction, weight reduction and moderation of alcohol consumption. The initial blood pressure and weight were recorded. All the patients will be called for follow up (FU) in one month and three months. Then in the next follow up there was another questionnaire to re-evaluate the patient’s knowledge of lifestyle modifications and their blood pressure and weight was recorded.

Data was reported according to range of blood pressure measurement and time to follow-up examination. All data was compiled using descriptive statistics.

A simple random sampling was done.

The sample size was calculated using the following formula:

$$n = (Z^2 \times p \times q) / e^2$$

$$= (1.96)^2 \times 0.5 \times (1-0.5) / (0.10)^2$$

$$= 96.04$$

$$= 97$$

Where,

- n= minimum required sample size,
- Z= 1.96 at 95% Confidence Interval (CI)
- p= prevalence taken as 50%
- q= 1-p
- e= margin of error, 10%

The minimum required sample size was 97. However, a total of 100 sample size was taken for the study. The results of different test were recorded in the proforma.

Data were collected and entered in Microsoft Excel version 2007. Collected data were analyzed in the Statistical Package for the Social Sciences (SPSS) software version 25.0. The statistical analysis was done by using chi-square test.

### III. RESULTS

In this study, Change in blood pressure across visits BP > 140/90 and BP between 120/80 and 140/90. In first visit patient 94% and 6%, in first FU 13.2% and 86.8%, and in second FU 2% and 98% respectively. The data showed that blood pressure decreased with further visits. The analysis using chi-square test showed the P value <0.001 which is a highly significant change. In our study we also found that there is changes in weight across visits (As shown in Figure 1).

In this study, a total of 100 patients in which 50 females and 50 males (1:1) were selected (As shown in Figure 2). The distribution of study population in different age groups are 16-25, 26-35, 36-45, 46-55 and 56-65 are 5%, 23%, 27%, 29% and 16% respectively. About the knowledge of patients about lifestyle modifications, exercise habits, types of exercise, duration of exercise are gradually increased in first FU and second FU and salt intake, different cooking oil use, cigarettes smoking, consuming alcohol, amount of alcohol consumed and frequency of alcohol consumption (times/week) are gradually decreased across the visits (As shown in Table 1).

	Frequency on 1st visit (1)	Frequency on 1st FU (2)	Frequency on 2nd FU (3)
Mean	63.60	62.88	60.06
Standard Deviation	9.55	9.47	9.43
P Value			

Fig 1. Change in weight across visits (Chi-square analysis of weight decrease showed the P value <0.001 – highly significant decrease in weight).

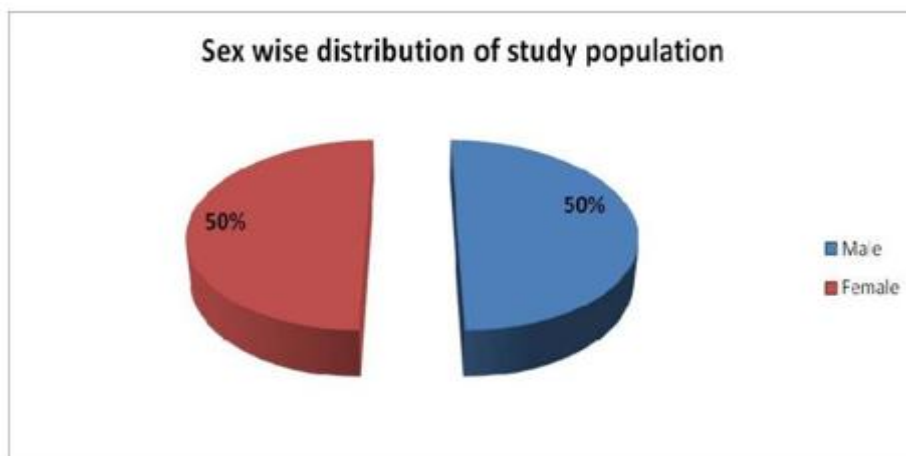


Fig 2. Distribution of study population according to their sex (n=100).

Variables categories	Percentage of Patients on 1st visit (1)	Percentage of Patients on 1st FU (2)	Percentage of Patients on 2nd FU(3)
<b>Weights (Kg) in groups</b>			
40-50	8%	10.30%	19.60%
51-60	36%	32.3%	31.4%
61-70	29%	32.4%	39.2%
≥71	27%	25%	9.8%
<b>Changes in Treatment status</b>			
No Treatment	75%	70.6%	76.5%
Already on Treatment	13%	29.4%	23.5%
Treatment Started	12%	6.3%	0%
<b>Knowledge of patients about lifestyle modifications</b>			
Knows	26%	100%	100%
Not Knows	74%	0%	0%
<b>Cooking oil use</b>			
Refined	44%	97.1%	100%
Mustard	56%	2.9%	0%
<b>Salt intake</b>			
Habit of using extra salt	55%	0%	0%
No habit of using extra salt	45%	100%	100%
<b>Exercise habits</b>			
No	78%	0%	0%
Yes	22%	100%	100%
<b>Types of exercise</b>			
Gym	13.6%	2.9%	1.9%
Jogging	36.4%	48.5%	49%
Skipping	4.5%	5.9%	6%
Walking	45.5%	42.7%	43.1%
<b>Duration of exercise</b>			
More than 45 min/day	13.6%	100%	100%
30-45 min/day	27.3%	0%	0%
Less than 30 min/day	59.1%	0%	0%
<b>Smoking habits</b>			
Yes	33%	23.5%	19.6%
No	67%	76.5%	80.4%
<b>Number of cigarettes smoked</b>			
More than 10 cig/day	51.5%	0%	0%
5-10 cig/day	18.2%	12.5%	10%
Less than 5 cig/day	30.3%	87.5%	90%
<b>Number of patients consuming alcohol</b>			

Yes	35%	22%	23.5%
No	65%	78%	76.5%
<b>Amount of alcohol consumed</b>			
More than 2 standard drinks/day	51.4%	13.3%	8.4%
Less than 2 standard drink/day	48.6%	86.7%	91.6%
<b>Frequency of alcohol consumption (times/week)</b>			
<3	2.9%	20%	16.7%
3-6	60%	80%	83.3%
>6	37.1%	0%	0%
<b>Change in blood pressure across visits</b>			
BP > 140/90	94%	13.2%	2%
BP between 120/80 and 140/90	6%	86.8%	98%
<b>Total</b>	100%	100%	100%

Table 1: Data's of patients in first visit and follow up(s).

Note: Follow up (FU)

#### IV. DISCUSSION

In this study by comparing the person who was diagnosed as a hypertension for the first time and the person who were already diagnosed as a hypertensive, there was not much difference in the understanding about lifestyle modifications. In our study only 26% of patients knew about lifestyle modification at the first visit. It means that the most of the patients who were previously diagnosed as hypertensive either were not properly counselled about the lifestyle modification or did not take it very seriously. When they were counselled about the relevant information in this study then they follow the guidelines and showed the expected benefits.

This study indicates that, at least in the short term, a simple cognitive- behavioral self-management intervention can lead to clinically significant reductions in both systolic and diastolic blood pressure. Patients also reduced their waist circumference, body weight, became more active and reduced their blood cholesterol. Although previous study of behavioral change programmes have produced similar benefits for hypertensive patients,<sup>3-5</sup> this study did so with a very much lower amount of input.

Most of the people who were included in this study were having increased weight. More than 50% of patients were having increased weight according to their age. Only 22% of patient were doing exercise as their regular habit in this study. After proper counselling most of the patient started doing exercises in various forms up to more than 45 min. They also changed the cooking oil to refined oil. These changes were associated with a reduction in weight. Ultimately as the weight was reduced, the effect was also seen in blood pressure which also started to decline. The effect of this decreased weight and increased exercise produced a similar benefit in blood pressure lowering to other previous studies.<sup>6,7</sup> The fall in blood pressure in this study cannot be attributed directly to the physical exercise. Exercise results in loss of body fat, a redistribution of fat stores, and weight loss. All of these are associated with a concomitant reduction in blood pressure. In

this study physical exercise was just one of several interventions.

Talking about the context of lifestyle modification in the case of hypertension one cannot forget the role of sodium. In this study, before counselling patients had habit of adding extra salt in their food from outside. A decreased intake of dietary sodium has been demonstrated to have a hypotensive effect, both alone and as an adjunctive measure to pharmacologic therapy. Sodium consumption has long been associated with hypertension. Many studies support the consensus of the relationship between sodium intake and hypertension.<sup>8,9</sup>

Reduction in smoking was one of the important interventions in this study. When given information about the serious impact which can be due to smoking in hypertensive patients, all of the smokers either left smoking or decreased the of number cigarette use per day. By decreasing the number of cigarettes or by quitting one can also decrease the blood pressure. Different studies shows the relationship between smoking and hypertension.<sup>10,11</sup>

As compare to the previous study about alcohol consumption different study had given the different results. In this study it has been shown that by limiting the daily intake of alcohol consumption to not more than two standard drink or by quitting alcohol, as part of general lifestyle change, blood pressure decreases. Most of the people who drink alcohol excessively are likely to suffer from hypertension. In one study conducted in Japan, show a relationship with alcohol consumption and hypertension.<sup>12</sup> While other study shows a consistent relationship has been noted between consumption of alcohol and increased blood pressure, and reduced intake of alcohol has been shown to decrease blood pressure significantly.<sup>13,14</sup>

Ample evidence supports the beneficial effects of healthful lifestyle modifications in the prevention and management of hypertension. Therefore, physicians should be motivated to provide guidance to the population relative to lifestyle modification practices that can help prevent and

control hypertension.<sup>15,16</sup> Patients with elevated blood pressure should follow a weight-reducing diet, take regular exercise, and restrict alcohol and salt intake.

The sample is specifically limited to the patients attending OPD of Bardiya Hospital, mid-western Nepal. Findings are limited because they are based on a limited population at one site. One obvious serious limitation in this study is the short follow-up period. The other serious limitation is common to all studies that use the information provided by patients and their relatives. There is no simple method of verifying patients' reports about things such as diet and exercise. The fact that subjects' weight and blood pressure showed significant reduction supports the information that they had given about themselves.

## V. CONCLUSIONS

Our study about lifestyle modifications in the management of hypertension was similar when compared to other studies conducted in similar settings. The present data gives an insight into whether patients with hypertension follows special attention on lifestyle modifications and provision of follow-up instructions upon initial diagnosis of hypertension. There is changes in BP across visits and after following lifestyle modifications changes, there is changes in weight across visits. On time education and information about exercise, weight loss, less salt intake, less alcohol and cigarette consumption plays an important role in management of hypertensive patients and reduce future risk.

**Conflict of Interest: None.**

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