A comparative study to assess the effectiveness of foot massage & back massage in reducing blood pressure among hypertensive patients admitted in Medicine ward at tertiary care hospital, Bhubaneswar.

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Abstract: An experimental study was undertaken to assess and compare effectiveness of foot massage and back massage in reducing blood pressure among hypertensive patients admitted in Medicine ward at tertiary care hospital, Bhubaneswar.

Objective: To compare the effectiveness of foot massage & back massage among hypertensive patients.

Methodology: Evaluative and comparative research approach was adopted. Experimental pretest posttest control group design was used for this study. Simple random sampling technique was used for 70 hypertensive patients. The present study was conducted in Medicine Ward at PBMHospital, Bhubaneswar. The Patient were diagnosed with hypertension using the age of 40-60 years selected as sample and grouped under 40 for experimental (20 in each group: Group IA: Foot massage and Group IB: Back massage group). Group II: control group of 30 samples. Experimental group got the massage for 10 minutes and another was blood pressure monitoring table.

Results: The characteristics of the demographic variables described that, 52.85% was male patient, 32.85% resides in 61-70 yrs of age group; 20% female patients were unemployed and 17.14% male patients were self-employed; 15.71% male patients were graduate and 21.42% of female patients were of primary education; 37.14% of male patients and 24.28% of female patients were of non-veg; 25.71% of male patients were of 5 yrs. 35.71% of male and 30% of female patients are of primary sector. It is a cost effective method of reducing blood pressure.

Conclusion: The study concluded that the Foot and Back massage is effective in reducing blood pressure among male and female hypertensive patients. Back massage and Foot massage is widely practised in health care sectors. It is a cost effective method of reducing blood pressure. Nurse can easily learn this massage technique. It help to decrease blood pressure, length of hospital stay for patients with hypertension and reduces further complication related to hypertension.

Key words: Effectiveness, Foot massage, Back massage, Blood Pressure, Hypertensive patients.

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1. Introduction

Hypertension is silent killer disease ascebe cause people who have it are of tensymptomfree. In the National Health and Nutritional Examination Survey (NHANES) conducted from 2003 to 2010, 39% of people who had pressure exceeding 140/90mm Hg were unaware of the elevated blood pressure require monitoring regular intervals because hypertension is a lifelong condition.

Blood pressure level, the rate of aged related pressure increases and the prevalence of hypertension is variation among countries and among sub-population within a country. Hypertension is present in all population. High blood pressure slowly affects the body without any symptoms. Until it is measured in blood pressure at the blood pressure level the harm is not known what the blood pressure is.

Hypertension is silent killer disease. Blood pressure over time affects the body without any symptoms. Unless it is measured in blood pressure at the blood pressure level the harm is not known what the blood pressure is. Blood pressure level affects all organs of the body. 

There are two type of blood pressure according to medical diagnosis: 

1. Primary essential hypertension
2. Secondary hypertension

Primary hypertension (essential hypertension) is the most common type of hypertension. It is characterized by a gradual increase in blood pressure over time, usually beginning in later childhood or young adulthood. It is a lifelong condition. There are two types of primary hypertension.

A. Essential hypertension
B. Secondary hypertension

Secondary hypertension can be caused by other medical conditions, such as kidney disease, thyroid disorders, or certain medications. It is not caused by lifestyle factors like diet, exercise, or obesity.
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losing weight (foroverweight), regular physical exercise, a healthy diet, cessation of drinking alcohol, smoking, caffeine intake and low salt intake. Pharmacological treatment included use of Beta-blockers, Vasodilators, Calcium channel blockers and Diuretics.

Since hyperregimen has many side effects and complications from therapy and non-compliance is high. Complimentary therapy was proved to be one of the effective treatments of most of the diseased condition. Complimentary therapy such as Yoga, Exercise, Homeopathy, Acupuncture, Herbs, Oil can boost the immune system, help to eliminate toxins, help to relieve pain, improve circulation, improve sleep pattern, increase energy level, induce deep relaxation, reduce stress and tension and restore balance of body system.

II. Methodology

Evaluative and comparative research approach was adopted. Experimental pre test post test control group design was adopted for the study. Simple random sampling technique was used for 70 hypertensive patients. The present study was conducted in Medicine Ward at PBHM, Bhubaneswar. The patients were diagnosed with hypertension at the age of 40-60 years as selected as sample and grouped under 40 for experimental (20 in each: Group IA: Foot massage and Group IB: Back massage group), Group II: was control group of 30 samples. Experimental group got the massage for 10 minutes. Tool used in this study one was demographic tool and another was blood pressure monitoring table.

III. Results

The characteristics of the demographic variables described that, 52.85% was male patients, 32.85% resides in 61 - 70 yrs of age group; 20% female patients were unemployed and 17.14% male patients were self-employed; 15.71% male patients were graduate and 21.42% of female patients were of primary education; 37.14% of male patients and 24.28 % of female patients were practicing exercise on daily basis; 38.57% of male and 17.14% of female patients were maintaining walking every day; 15.71% of female patients practicing exercise for up to 30 minutes; 27.14% of female patients sleep for less than 5 hrs; 28.57% of male patients were diagnosed with hypertension of 1 - 5 yrs. 35.71% of male and 30% of female patients are of non veg; 25.71% of male patients are of 156 - 165 cm and 30% of female patients are of 145 - 155 cm in height; 24.28% of male patients are of 71-80 kg and 25.71% of female patients are 61 - 70 kg in weight.

Assess the existing blood pressure among hypertension patients

Distribution of measurements of mean Diastolic Blood Pressure and Systolic Blood Pressure of male and female patients under study. The Mean Diastolic Blood Pressure of male patients =86.70 with Standard Deviation of Diastolic Blood Pressure =2.07 and the Mean Diastolic Blood Pressure of female patients =87.83 with Standard Deviation of Diastolic Blood Pressure =2.93. Students unpaired t-test was filled and the difference between the mean Diastolic Blood Pressure of male and females is not statistically significant with p value of 0.1671.

Further the Mean Systolic Blood Pressure of male patients =142.9 with Standard Deviation of Systolic Blood Pressure =6.44 and the Mean Systolic Blood Pressure of female patients =143.9 with Standard Deviation of Diastolic Blood Pressure =7.201. The value of t =0.4629 for 38 d.f. Under 5% level of Significance and the test is Statistically significant at 95% confidence limit with p-value of 0.6461. Both the test show that there is no difference within males and females so far as their mean Diastolic Blood Pressure and Systolic Blood Pressure are concerned.

Assess the effectiveness of foot massage on reducing blood pressure

Comparison of Diastolic Blood Pressure between after Foot massage of male patients with 19 numbers male control group with anti-hypertensive drugs,t = 0.16,d.f. = 27. The test is highly significant at 95% confidence limit with p-value = 0.001.

Comparison of Systolic Blood Pressure between after Foot massage of male patients anti hypertensive drugs was found to be 137.06 mm of Hg with Standard Deviation of 6.48 with 19 numbers male control group with anti hypertensive drugs was found to be 142.03 mm of Hg with Standard Deviation of 3.23 was made ,t = 8.0775,d.f. = 27. The test is Statistically significant at 95% confidence limit with p-value = 0.0001.

Comparison of Diastolic Blood Pressure between after Foot massage of female patients with 19 numbers female control group with anti hypertensive drugs was made ie. Comparison between mean Distolic Blood Pressure of female patients is 83.13 with Standard Deviation = 3.29. The mean Distolic Blood Pressure of male control of 11 is found to be 90.66 mm of Hg with Standard Deviation = 1.813.,t = 6.58,d.f. = 19. The test is highly significant at 95% confidence limit with p-value = 0.0001. Hence it indicates that foot massage has significant role in reducing Systolic Blood Pressure in female hypertensive patients in comparison to female controls.

Assess effectiveness of back massage on reducing blood pressure

Comparison of Diastolic Blood Pressure between after Back massage of male patients with 19 numbers male control group with anti-hypertensive drugs.t = 8.0775,d.f. = 27. The test is extremely statistically significant at 95% confidence limit with p-value = 0.0001.

Comparison of Systolic Blood Pressure between after Foot massage of male patients anti hypertensive drugs was found to be 137.26 mm of Hg with Standard Deviation of 6.44 with 11 numbers male control group with anti hypertensive drugs was found to be 143.25 mm of Hg with Standard Deviation of 4.995 was made ,t = 2.39,d.f. = 19. The test is Statistically significant at 95% confidence limit with p-value = 0.0271. Hence it indicates that back massage has significant role in reducing Systolic Blood Pressure in female hypertensive patients in comparison to female controls.

Assess effectiveness of back massage on reducing blood pressure

Comparison of Diastolic Blood Pressure between after Back massage of male patients with 19 numbers male control group with anti-hypertensive drugs,t = 8.0775,d.f. = 27. The test is extremely statistically significant at 95% confidence limit with p-value = 0.0001. Hence this test implies that back massage significantly reduces Diastolic Blood Pressure of male patients with anti-hypertensive drugs in comparison to male hypertensive patients in control group.

Comparison of Systolic Blood Pressure between after Back massage of male patients anti hypertensive drugs was found to be 135.33 mm of Hg with Standard Deviation of 8.07 with 19 numbers male control group with anti hypertensive drugs was found to be 142.03 mm of Hg with Standard Deviation of 3.23 was made through t-test, the value of t = 3.2032,d.f. = 27. The test is highly Statistically significant at 95% confidence limit with p-value = 0.0001.

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Comparing Distolic Blood Pressure between after Back massage of female patients with 19 numbers male control group with anti hypertensive drugs was made. Comparison between mean Distolic Blood Pressure of female patients is 81.86 with Standard Deviation = 4.23. The mean Distolic Blood Pressure of male control of 11 is found to be 90.66 mm of Hg with Standard Deviation = 1.813. t-test was made. t = 6.4478, d.f. = 19. The test is extremely statistically significant at 95% confidence limit with p-value = <0.0001. The test is extremely statistically significant at 95% confidence level. It implied that Back Massage has significant effect on reducing diastolic blood pressure while comparing these two groups.

Comparing of Systolic Blood Pressure between after Back massage of male patients anti hypertensive drugs was found to be 138.59 mm of Hg with Standard Deviation of 3.25 with 11 numbers male control group with anti hypertensive drugs was found to be 143.45 mm of Hg with Standard Deviation of 4.995 was made. A t-test was applied to test the significance. The value of t = 2.612, d.f. = 19. The test is statistically significant with p-value = 0.0171. Hence it indicates that Back massage has significant effect in reducing Systolic Blood Pressure in female hypertensive patients in comparison to female controls at 95% confidence level.

### Comparing the effectiveness of back and foot massage on reducing blood pressure

#### Table 1: Distribution of Distolic Blood Pressure in male patients with anti hypertensive drugs to ascertain the effect of Foot Massage and Back Massage.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Male hypertensive patients</th>
<th>Male hypertensive patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Distolic Blood Pressure in mm of Hg.</td>
<td>Before Foot Massage</td>
<td>After Foot Massage</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>1.83</td>
<td>1.69</td>
</tr>
<tr>
<td>k</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

Comparison of Distolic Blood Pressure between after Foot massage and after Back massage having mean Distolic Blood Pressure as 81.53 mm of Hg. With Standard Deviation = 3.69 was compared with after Back massage and before Back massage having mean Distolic Blood Pressure as 79.53 mm of Hg. With Standard Deviation = 4.38 was made through application of Student's t-test. The value of t = 4.1459, d.f. = 9. The test is extremely statistically significant with p-value = 0.0006.

Comparison between Mean Distolic Blood Pressure of male patients with anti hypertensive drugs before and after Foot Massage: t = 4.2801, d.f. = 9. The test is extremely statistically significant with p-value = 0.0005.

Comparison between Mean Distolic Blood Pressure of male patients with anti hypertensive drugs before and after Back Massage: t = 6.4478, d.f. = 19. The test is extremely statistically significant with p-value = <0.0001. The test is extremely statistically significant at 95% confidence limits which clearly implies that Back Massage Significantly reduces the Distolic Blood Pressure in male hypertensive patients.

Further a comparison between Mean Distolic Blood Pressure of male patients with anti hypertensive drugs before Back massage as 86.48 mm of Hg. With a Standard Deviation of 2.68 with that of male hypertensive patients Mean Distolic Blood Pressure after back massage of 75.53 mm of Hg. With Standard Deviation = 4.38 was made through application of Student's t-test. The value of t = 4.2801, d.f. = 9 and p-value = 0.0005. The test was extremely statistically significant at 95% confidence limits which clearly implies that Back massage Significantly reduces the Distolic Blood Pressure in male hypertensive patients.

Again comparison between mean Distolic Blood Pressure of male patients with anti hypertensive drugs after Foot Massage and after Back massage having mean Distolic Blood Pressure as 79.53 mm of Hg. With Standard Deviation = 4.38 through application of t-test. The value of t = 1.1043 with d.f. = 18, the p-value = 0.2840. The test is not statistically significant which indicates that there is no significant difference between Foot massage and Back massage or in other words Foot and Back massage have equal effect on reducing Distolic Blood Pressure in male hypertensive patients.

#### Diagram Number - 1: Bar Diagram showing distribution of Distolic Blood Pressure in male patients with anti hypertensive drugs to ascertain the effect of Foot massage and Back massage.

#### Table Number-2: Distribution of Systolic Blood Pressure in male patients with anti hypertensive drugs to ascertain the effect of Foot Massage and Back Massage.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Male hypertensive patients</th>
<th>Male hypertensive patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean Systolic Blood Pressure in mm of Hg.</td>
<td>Before Foot Massage</td>
<td>After Foot Massage</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>6.19</td>
<td>6.48</td>
</tr>
</tbody>
</table>

A test for comparison between Mean Distolic Blood Pressure of male patients with anti hypertensive drugs before and after Foot massage was conducted and the value of t = 4.1459, d.f. = 9, p = 0.0006 and the test was extremely statistically significant at 95% confidence limits. This test implied that foot massage reduces Distolic Blood Pressure of male hypertensive patients.

Another comparison between Mean Systolic Blood Pressure of male patients with anti hypertensive drugs before Back massage as 86.48 mm of Hg. With a Standard Deviation of 2.68 with that of male hypertensive patients mean Systolic Blood Pressure after back massage of 75.53 mm of Hg. With Standard Deviation = 4.38 was made through application of Student's t-test. The value of t = 4.2801, d.f. = 9 and p-value = 0.0005. The test was extremely statistically significant at 95% confidence limits which clearly implies that Back massage Significantly reduces the Systolic Blood Pressure in male hypertensive patients.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Mean</th>
<th>Distribution of Diastolic Blood Pressure in male patients with anti hypertensive drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before Foot Massage</td>
<td>After Foot Massage</td>
</tr>
<tr>
<td>Mean Diastolic Blood Pressure</td>
<td>81.53</td>
<td>86.48</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>3.69</td>
<td>4.38</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Mean</th>
<th>Distribution of Systolic Blood Pressure in male patients with anti hypertensive drugs</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before Foot Massage</td>
<td>After Foot Massage</td>
</tr>
<tr>
<td>Mean Systolic Blood Pressure</td>
<td>75.53</td>
<td>79.53</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>4.38</td>
<td>4.08</td>
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</tbody>
</table>

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The Table Number 5.2 provides data on Mean Systolic Blood Pressure of male patients with anti hypertensive drugs before Foot Massage as 143.26 mm of Hg. With Standard Deviation = 6.19. Mean Systolic Blood Pressure of male patients with anti hypertensive drugs after Foot Massage as 137.06 mm of Hg. With Standard Deviation = 6.48. A t-test for comparison between Mean Systolic Blood Pressure of male patients with anti hypertensive drugs before and after Foot Massage was conducted and the value of t = 2.1878,d.f. = 9. The test is Statistically significant,p =0.0421. This test implied that foot massage reduces Systolic Blood Pressure of male hypertensive patients.

Further a comparison between Mean Systolic Blood Pressure of male patients with anti hypertensive drugs before and after Back Massage as 142.53 mm of Hg. With a Standard Deviation of 7.23 with that of male hypertensive patients mean Systolic Blood Pressure after back massage of 135.33 mm of Hg. With Standard Deviation = 7.23 was made through application of Student,s t-test and the said male patients after Back massage having mean Systolic Blood Pressure as 137.06 mm of Hg. With Standard Deviation = 7.23 was compared with that of male hypertensive drugs before Back Massage as 143.26 mm of Hg. With Standard Deviation = 6.48. A t-test was statistically significant at 95% confidence limits which clearly implies that Back Massage Significantly reduces the Systolic Blood Pressure in male hypertensive patients.

Again comparison between mean Systolic Blood Pressure of male patients with anti hypertensive drugs after Foot Massage and after Back Massage as 137.06 mm of Hg. With Standard Deviation 6.48 was compared with the said male patients after Back massage having mean Systolic Blood Pressure as 135.33 mm of Hg.with Standard Deviation = 8.07 through application of t-test. The value of t = 0.5286,d.f. = 18, p =0.6035. The test is not statistically significant which indicates that there is no significant difference betweenFoot Massage and Back Massage or in other words Foot and Back Massage have equal effect on reducing Systolic Blood Pressure in male hypertensive patients.

Table Number - 3: Distribution of Diastolic Blood Pressure in female patients with anti hypertensive drugs to ascertain the effect of Foot Massage and Back Massage.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Female hypertensive patients</th>
<th>Female hypertensive patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Before Foot Massage</td>
<td></td>
<td>After Foot Massage</td>
</tr>
<tr>
<td>Mean Diastolic Blood Pressure in mm of Hg.</td>
<td>88.79</td>
<td>83.13</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>3.29</td>
<td>3.29</td>
</tr>
<tr>
<td>N</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

The Table Number 5.3 provides data on Mean Diastolic Blood Pressure of female patients with anti hypertensive drugs before Foot Massage as 88.79 mm of Hg. With Standard Deviation = 2.89 and Mean Diastolic Blood Pressure of female patients with anti hypertensive drugs after Foot Massage as 83.13 mm of Hg. With Standard Deviation = 3.29. A t-test for comparison between Mean Diastolic Blood Pressure of female patients with anti hypertensive drugs before and after Foot Massage was conducted and the value of t = 4.0873,d.f. = 9, p =0.0007 and the test was extremely statistically significant at 95% confidence limits. This test implied that foot massage reduces Diastolic Blood Pressure of female hypertensive patients.

Further a comparison between Mean Diastolic Blood Pressure of female patients with anti hypertensive drugs before Back Massage as 86.86 mm of Hg. With a Standard Deviation of 2.774 with that of female hypertensive patients mean Diastolic Blood Pressure after back Massage of 81.86 mm of Hg. With Standard Deviation = 2.774 was made through application of Student,s t-test. The value of t = 3.0007,d.f. = 9,p =0.0077. The test implied that back massage reduces Diastolic Blood Pressure of female hypertensive patients.

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test was very Statistically significant at 95% of confidence limits which clearly implies that Back Massage significantly reduces the Diastolic Blood Pressure in female hypertensive patients.

Again comparison between mean Diastolic Blood Pressure of female patients with anti hypertensive drugs after Foot Massage and after Back Massage was 83.13 mm of Hg. With Standard Deviation = 3.29 was compared with the said female patients after Back massage having mean Diastolic Blood Pressure as 81.86 mm of Hg. With Standard Deviation = 4.23 through application of t-test. The value of t = 0.7494, d.f. = 18, p = 0.4633. The test is not statistically significant which indicates that there is no significant difference between Foot Massage and Back Massage or in other words Foot and Back Massage have equal effect on reducing Distolic Blood Pressure in female hypertensive patients.

**Diagram Number - 3:** Bar Diagram showing distribution of Diastolic Blood Pressure in female patients with anti hypertensive drugs to ascertain the effect of Foot Massage and Back Massage.

**Table Number - 4:** Distribution of Systolic Blood Pressure in female patients with anti hypertensive drugs to ascertain the effect of Foot Massage and Back Massage.

<table>
<thead>
<tr>
<th>Indicators</th>
<th>Female hypertensive patients</th>
<th>Female hypertensive patients</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Before Foot Massage</td>
<td>After Foot Massage</td>
</tr>
<tr>
<td>Mean Systolic Blood Pressure in mm of Hg</td>
<td>144.19</td>
<td>137.26</td>
</tr>
<tr>
<td>Standard Deviation</td>
<td>6.72</td>
<td>6.44</td>
</tr>
<tr>
<td>n</td>
<td>10</td>
<td>10</td>
</tr>
</tbody>
</table>

Comparison between Mean Systolic Blood Pressure of female patients with anti hypertensive drugs before and after Foot Massage: t = 2.3545, d.f. = 9. The test is Statistically significant, p = 0.0301.

Comparison between Mean Systolic Blood Pressure of female patients with anti hypertensive drugs before and after Back Massage: t = 2.8679, d.f. = 9. Statistically significant, p = 0.0102.

Comparison between Mean Systolic Blood Pressure of female patients with anti hypertensive drugs after Foot Massage and after Back Massage: t = 0.5830, d.f. = 18. Not Statistically significant, p = 0.5671.

The Table Number 5.4 provides data on Mean Systolic Blood Pressure of female patients with anti hypertensive drugs before Foot Massage as 144.19 mm of Hg. With Standard Deviation = 6.72 and Mean Systolic Blood Pressure of female patients with anti hypertensive drugs after Foot Massage as 137.26 mm of Hg. With Standard Deviation = 6.44. A t-test for comparison between Mean Systolic Blood Pressure of female patients with anti hypertensive drugs before and after Foot Massage was conducted and the value of t = 2.3545, d.f. = 9. The test is Statistically significant, p = 0.0301 at 95% confidence limits. This test implied that foot massage reduces Systolic Blood Pressure of female hypertensive patients.

Further a comparison between Mean Systolic Blood Pressure of female patients with anti hypertensive drugs before and after Back Massage as 143.93 mm of Hg. With a Standard Deviation of 4.91 with that of female hypertensive patients mean Systolic Blood Pressure after Back Massage of 138.59 mm of Hg. With Standard Deviation = 3.25 was made through application of Student's t-test. The value of t = 2.8679, d.f. = 9, p = 0.0102. The test was statistically significant at 95% of confidence limits which clearly implies that Back Massage significantly reduces the Systolic Blood Pressure in female hypertensive patients.

Again comparison between mean Systolic Blood Pressure of female patients with anti hypertensive drugs after Foot Massage and after Back Massage as 137.26 mm of Hg. With Standard Deviation = 6.44 was compared with the said female patients after Back massage having mean Systolic Blood Pressure as 138.59 mm of Hg. With Standard Deviation = 3.25 through application of t-test. The value of t = 0.5830, d.f. = 18, p = 0.5671. The test is not statistically significant which indicates that there is no significant difference between Foot Massage and Back Massage or in other words Foot and Back Massage have equal effect on reducing Systolic Blood Pressure in female hypertensive patients.
The study Results shows that the Foot and Back massage is effective in reducing systolic and diastolic blood pressure but both have equal effect in reducing Blood pressure.

IV. Conclusion

The study concluded that the Foot and Back massage is equally effective in reducing blood pressure in male and female hypertensive patients. Back massage and Foot massage is widely practised in health care sectors. It is a cost effective method of reducing blood pressure. Nurse can easily learn this massage technique.

It helps to decrease blood pressure, length of hospital stay for patients with hypertension and reduces further complication related to hypertension.

Bibliography


