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A comparative study to assess the effectiveness of foot massage & back massage in reducing blood pressure among hypertensive patients admitted in Medicine ward attertiarycare 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:*Tocomparetheeffectivenessoffootmassage&backmassageamongthehypertensivepatient.*
Methodology:*Evaluative and comparative research approach was adapted. 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 werediagnosedwithhypertentionattheageof40-60years 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.*
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 -70kg in weight.Independent t test was used to see the effectiveness of both the massage therapy in reducing blood pressure.The t value of Group IA male in diastolic blood pressure is >0.16 and in systolic blood pressure is 2.779 comparing with the post test blood pressure level in control group.The t value of Group IA female in diastolic blood pressure is 6.85 and in systolic blood pressure is 2.39 comparing with the post test blood pressure level in control group. The t value of Group IB male in diastolic blood pressure is 8.0775 and in systolic blood pressure is 3.2032 comparing with the post test blood pressure level in control group.The t value of Group IB female in diastolic blood pressure is 6.4478 and in systolic blood pressure is 2.612 comparing with the post test blood pressure level in control group. Comparing the t value of both experimental group male post test diastolic and systolic blood pressure is 1.1043 and 0.5286 respectively and similarly for female is 0.7494 and 0.5830 which is mot significant.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.*
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 help to decrease blood pressure, length of hospital stay for patients with hypertention and reduces further complication related to hypertention.*
Key words: *Effectiveness, Foot massage, Back massage, Blood Pressure, Hypertensive patients.*

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I. Introduction

Hypertension issilentkillerdiseasebe cause people who have it are of tensymptomfree. In the National Health and Nutritional Examination Survey (NHANES) conducted from 2003 to2010,39% people who had pressure exceeding 140/90mm of Hgwereuna ware of the irelevated blood pressure require monitoring regularintervalsbecausehypertensionisalifelongcondition.[1]

Bloodpressurelevel,therateofagerelatedpressureincreasesandtheprevalenceof hypertensionvaryamongcountriesandamongsub-populationwithin country. Hypertensionispresentinallpopulation.Highbloodpressuresilentlyaffectstothebodywithoutanyspecificsignsand symptoms.Unlessuntilonecanmeasurebloodpressurehe/shewouldnotknowthat,he/sheissufferingfromhypertension.Itsilentlyandslowlydamagesthetargetorgansofthebodylikebrain,heart,kidneyandeye.[2]

Thereare twotypeof bloodpressureaccordingtomedicaldiagnosis; theprimaryoressentialhypertensionandthesecondaryhypertension.About95%ofpeoplearesuffering fromprimary hypertension.Both non -pharmacological and pharmacological treatment areprescribedtocontrolhighbloodpressure.AccordingtoWHOexpertcommittee1996andJointNationalCommitteeReport onPrevention,DetectionandEvaluationofhigh bloodpressurerecommends non-pharmacological treatmentasthefirstmeasureof choice.Non-pharmacological treatmentincludelifestylemodification.Therisk factor wherethesecanbeimproved-

losingweight(foroverweight),regularphysical exercise,ahealthydiet,cessationofdrinkingalcohol,smoking,caffeineintakeandlowsaltintake.Pharmacologicaltreatment includetheuse ofBeta- b l o c k e r s , Vasodilators, Calcium channelblockersandDiuretics.[3]

Sincethedrugregimenhasasmanyassideeffectsandcomplicationstherateofnoncompliance ishigh. Complementarytherapywasprovedt h a t oneoftheeffectivetreatmentsofmostofthediseasecondition. ComplementarytherapysuchasYoga,Exercise, Homeopathy,Acupuncture, Herband Oilcanboosttheimmunesystem,helptoeliminatetoxins, helptorelievepain,improvecirculation,improvesleeppattern,increaseenergylevel, inducesdeeprelaxation ,reducesstressandtensionandrestorebalancebodysystem.[1]

II. Methodology

Evaluative and comparative research approach was adapted. Experimental pre testpost 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 PBMH, Bhubaneswar. The Patient werediagnosedwithhypertentionattheageof40-60yearsselected 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 diagnosedwith 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 kgand 25.71% of female patients are 61 -70kg 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 difference between the mean Systolic Blood Pressure of male patients and the female patients is not statistically significant 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 = 0.0001.

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 = 2.779,d.f. = 27.The test is Statistically significant at 95% confidence limit with p - value = <0.001

Comparison of Diastolic Blood Pressure between after Foot massage of female patients with 19 numbers male 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.

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 6.44with 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 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 Distolic 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 groups.

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

= 0.003.It indicates that the difference is highly significant and the back massage significantly reduces the systolic blood pressure in hypertensive patients.

Comparison of Distolic Blood Pressure between after Back massage of female patients with 19 numbers male control group with anti hypertensive drugs was made ie.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.

Comparison 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 3.25with 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 Diastolic Blood Pressure in male patients with anti hypertensive drugs to ascertain the effect of Foot Massage and Back Massage.

Indicators	Male hypertensive patients		Male hypertensive patients	
	Before Foot Massage	After Foot Massage	Before Back Massage	After Back Massage
Mean Diastolic Blood Pressure in mm of Hg.	86.93	81.53	86.48	79.53
Standard Deviation	1.83	3.69	2.68	4.38
n	10	10	10	10
Comparison between Mean Diastolic Blood Pressure of male patients with anti hypertensive drugs before and after Foot Massage: t = 4.1459,d.f. = 9, Extremely Statistically significant,p =0.0006.				
Comparison between Mean Diastolic Blood Pressure of male patients with anti hypertensive drugs before and after Back Massage: t = 4.2801,d.f. = 9, Extremely Statistically significant,p =0.0005.				
Comparison between Mean Diastolic Blood Pressure of male patients with anti hypertensive drugs after Foot Massage and after Back Massage: t = 1.1043,d.f. = 18, Not Statistically significant,p =0.2840.				

A test for comparison between Mean Diastolic 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 Diastolic Blood Pressure of male hypertensive patients.

Further a comparison between Mean Diastolic 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 Diastolic 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% of confidence limits which clearly implies that Back Massage Significantly reduces the Diastolic Blood Pressure in male hypertensive patients.

Again comparison between mean Diastolic Blood Pressure of male patients with anti hypertensive drugs after Foot Massage and after Back Massage as 81.53 mm of Hg. With Standard Deviation 3.69 was compared with the said male patients after Back massage having mean Diastolic 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 betweenFoot Massage and Back Massage or in other words Foot and Back Massage have equal effect on reducing Diastolic Blood Pressure in male hypertensive patients.

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

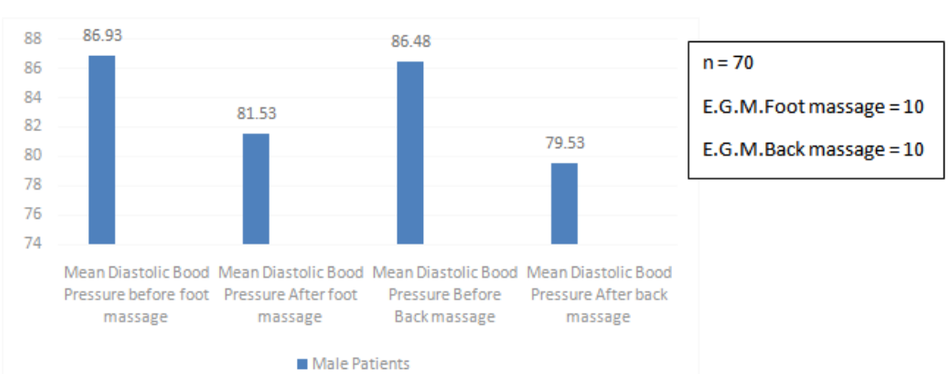


Table Number-2: Distribution of Systolic Blood Pressure in male patients with anti hypertensive drugs to ascertain the effect of Foot Massage and Back Massage.

Indicators	Male hypertensive patients		Male hypertensive patients	
	Before Foot Massage	After Foot Massage	Before Back Massage	After Back Massage
Mean Systolic Blood Pressure in mm of Hg.	143.26	137.06	142.53	135.33
Standard Deviation	6.19	6.48	7.23	8.07

n	10	10	10	10
Comparison between Mean Systolic Blood Pressure of male patients with anti hypertensive drugs before and after Foot Massage: t = 2.1878,d.f. = 9, The test is Statistically significant,p =0.0421.				
Comparison between Mean Systolic Blood Pressure of male patients with anti hypertensive drugs before and after Back Massage: t = 2.1014,d.f. = 9, Statistically significant,p =0.0500.				
Comparison between Mean Systolic Blood Pressure of male patients with anti hypertensive drugs after Foot Massage and after Back Massage: t = 0.5286,d.f. = 18, Not Statistically significant,p =0.6035.				

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 and 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-est 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.at 95% confidence limits.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 = 8.07 was made through application of Student,s t-test.The value of t = 2.1014,d.f. = 9,p =0.0500.The test was statistically significant at 95% of confidece 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.

Diagram Number - 2: Bar Diagram showing distribution of Systolic Blood Pressure in male patients with anti hypertensive drugs to ascertain the effect of Foot Massage and Back Massage.

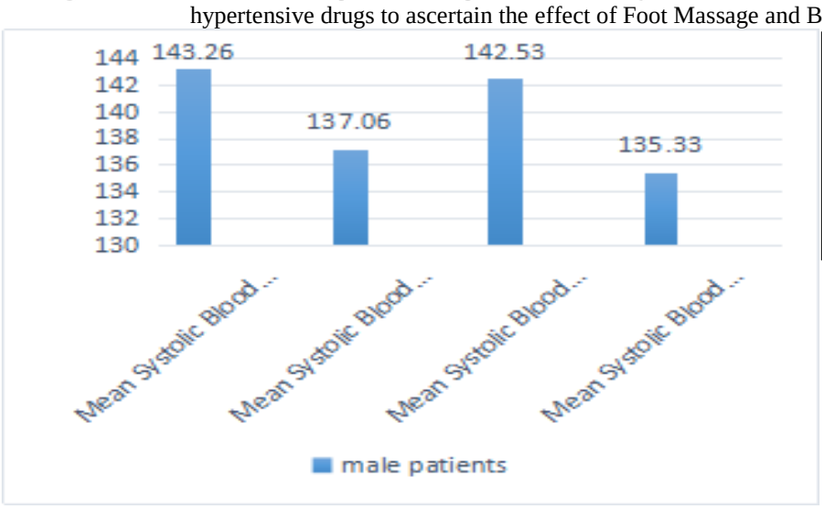


Table Number - 3: Distribution of Diastolic Blood Pressure in female patients with anti hypertensive drugs to ascertain the effect of Foot Massage and Back Massage.

Indicators	Female hypertensive patients		Female hypertensive patients	
	Before Foot Massage	After Foot Massage	Before Back Massage	After Back Massage
Mean Distolic Blood Pressure in mm of Hg.	88.79	83.13	86.86	81.86
Standard Deviation	2.89	3.29	2.774	4.23
N	10	10	10	10
Comparison between Mean Diastolic Blood Pressure of female patients with anti hypertensive drugs before and after Foot Massage: t = 4.0873,d.f. = 9, Extremely Statistically significant,p =0.0007.				
Comparison between Mean Diastolic Blood Pressure of female patients with anti hypertensive drugs before and after Back Massage: t = 3.0007,d.f. = 9, very Statistically significant,p =0.0077.				
Comparison between Mean Diastolic Blood Pressure of female patients with anti hypertensive drugs after Foot Massage and after Back Massage: t = 0.7494,d.f. = 18, Not Statistically significant,p =0.4633.				

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-est 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 = 4.23 was made through application of Student,s t-test.The value of t = 3.0007,d.f. = 9,p =0.0077.The

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 as 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 betweenFoot 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.

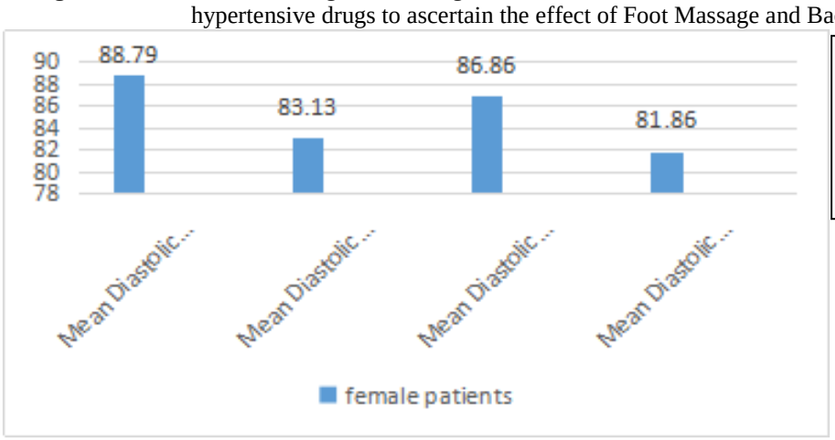


Table Number - 4: Distribution of Systolic Blood Pressure in female patients with anti hypertensive drugs to ascertain the effect of Foot Massage and Back Massage.

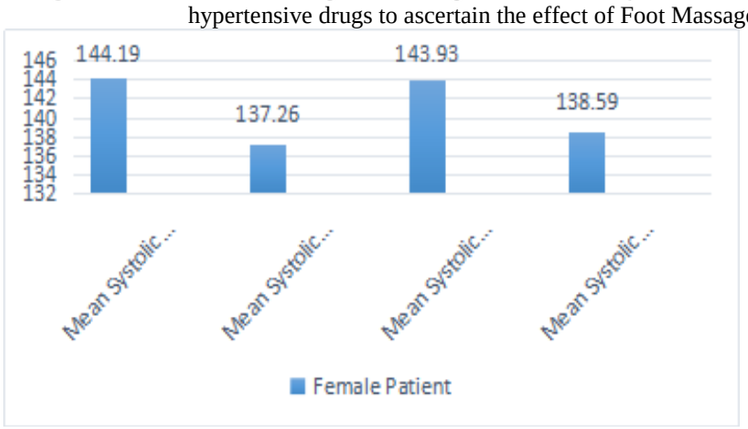
Indicators	Female hypertensive patients		Female hypertensive patients	
	Before Foot Massage	After Foot Massage	Before Back Massage	After Back Massage
Mean Systolic Blood Pressure in mm of Hg.	144.19	137.26	143.93	138.59
Standard Deviation	6.72	6.44	4.91	3.25
n	10	10	10	10
Comparison between Mean Systolic 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-est 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 =0.0301at 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.

Diagram Number - 4: Bar Diagram showing distribution of Systolic Blood Pressure in female patients with anti hypertensive drugs to ascertain the effect of Foot Massage and Back Massage.



n= 70

E.G.F.Foot massage = 10

E.G.F.Back massage = 10

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 help to decrease blood pressure, length of hospital stay for patients with hypertention and reduces further complication related to hypertention.

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