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Original Research Article

Acomparative study on the effect of cross legged sitting with flat feet sitting position on blood pressure reading among normotensive young adults in selected college, Guwahati, Assam

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ABSTRACT

Background: Blood pressure(BP) measurement is a basic clinical procedure and perhaps the most frequently performed clinical procedure in any health care setting, it strongly depends both on the number of measurements and the body position during the procedure. Many important therapeutic decisions rely on the accuracy of assessment ,Unfortunately , blood pressure measurement is one of the most inaccurately performed procedure done by healthcare provider. Inspire of studies having shown that many errors are made while recording BP, crucial decisions about treatment are made based on these inaccurate measurements. Efforts have continuously been made to standardize the procedure, but remain difficult to reach a consensus among different official guidelines for BP measurement**.**

Statement of Problem: A comparative study on the effect of cross legged sitting with flat feet sitting position on blood pressure reading among normotensive young adults in selected college, Guwahati, Assam.

Setting: Army Institute of Nursing ,C/O- 151 Base Hospital, Basistha, Guwahati, Assam.

Design: Descriptive comparative design.

Materials and Methods: A descriptive comparative design was adopted for the study ,sixty normotensive young adults were selected using purposive sampling technique from the selected college of Guwahati, Assam. The data was collected by a questionnaire and blood pressure measurements were documented.Automated sphygmomanometer (OMRON HEM -8712 ,SERIAL NO 20190604417VG). The measurement was taken 5 minutes elapse before the first reading and then one minute gap between next three readings in flat feet and cross legs at knee level. The data were analysed using percentage, frequency, mean, SD Statistical significance was set at p<.05.

Statistical analysis: The data were coded and organized in a master sheet and were analyzed by using the SPSS Version 24.

Results: Total of sixty normotensive young adults were included in the BP measurements taken from flat feet sitting position and cross-legged sitting position and results indicates systolic blood pressure increases significantly (p<.05)with the cross-legged sitting position.

Conclusion: Cross legged sitting position can affect systolic blood pressure reading significantly among normotensive young adults.

1. Introduction

Blood pressure is an important parameter to rule out the risk of health problems in the future.[1,2] If the blood pressure is high, it puts extra strain on the arteries and to the heart. Over the time, this strain can cause the arteries to become thicker and less flexible, or to become weaker.If arteries become thicker and less flexible, they will become more narrow ,making them more likely to clogged up. If an artery becomes completely clogged up that can lead to a

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heart attack, a stroke, kidney disease or dementia , also cause heart attack or stroke.[3] An individual's blood pressure measurement is influenced by many factors including age, weight, physical conditioning, past illness, time of day, alltitudee, activity and climate. In daily clinical practice, body position is neglected while taking blood pressure reading and considering that as baseline drug dosage are adjusted. One of the ignored factor while recording blood pressure is crossing of legs which causes pooling of blood in legs due to compression of veins , thus affecting the correct BP recording.[4] The main purpose of the study is to find how significantly blood pressure reading changes with crossing the legs at knee level while blood pressure is being recorded.

2. Aim

To compare the effect of cross-legged sitting position with flat feet sitting position on blood pressure reading among normotensive young adults.

3. Objectives

1. To compare the mean systolic and diastolic blood pressure recorded in the flat feet sitting position and cross-legged sitting position among normotensive young adults.
2. To examine association of systolic and diastoilc blood pressure recorded in flat feet and cross-legged sitting position with selected demographic and clinical variables among normotensive young adults.

4. Hypotheses

Hypotheses will be tested at .05 level of significance.

1. $\mathbf{H}_{01}$ **:** There will be no difference in the average systolic blood pressure reading when BP recorded in flat feet and cross legged sitting positions.
2. $\mathbf{H}_{02}$ **:** There will be no difference in the average diastolic blood pressure reading when BP recorded in flat feet and cross legged sitting positions.
3. **H1 :** There is a significant difference in the systolic blood pressure recorded in the flat feet sitting position and cross legged sitting position.
4. **H2 :**There is a significant difference in the diastolic blood pressure recorded in the flat feet sitting position and cross legged sitting position.
5. **H3:** There is a significant association of systolic blood pressure recorded in flat feet sitting position with selected demographic and clinical variables.
6. **H4:** There is a significant association of systolic blood pressure recorded in cross-legged sitting position with selected demographic and clinical variables.
7. **H5:** There is a significant association of diastolic blood pressure recorded in flat feet sitting position with selected demographic and clinical variables.
8. **H6:** There is a significant association of diastolic blood pressure recorded in cross-legged sitting position with selected demographic and clinical variables.

5. Material and Methods

This comparative study was carried out on the normotensive young adults of Army Institute of Nursing, Guwahati, Assam from25^{th}june 2020 to 8^{th}july 2020.A total of 60 Normotensive Young Adults(both males and females)of age 19 to 40 years were taken for this study.

5.1. Study design

Descriptive comparative design.

5.2. Study location

This was done on Army Institute of Nursing ,C/O- 151 Base Hospital ,Basistha, Guwahati, Assam.

5.3. Study duration

25^{th}june 2020 to 8^{th}july 2020

5.4. Sample size

Normotensive young adults

5.5. Sample size calculation

The sample size based on the previous study done by Piner R, Sabuncu N, Oksay A. Effects of crossed leg on blood pressure 2004 ;13:252-254.[5] After calculation with 1% effect size and 95%power, the sample size obtained for this study was 50. A sample of 60 was planned to study the difference in the blood pressure measurement in two different position .

5.6. Subjects & selection method

Purposive sampling technique was adopted after random selection of the participants from Army Institute of Nursing and according to the purpose of the study 60 normotensive young adults were chosen.

5.7. Inclusion criteria

1. Individuals who do not had injury in left arm.
2. Male and female individuals
3. Individual in the age group 19 to 40 years

5.8. Exclusion criteria

1. Individuals under medication for blood pressure control .
2. Individuals who are having breathing difficulty and giddiness at the time of data collection procedure.

3. Individuals in acute pain.
4. Individuals unable to cross legs at knee level due to trauma, limb amputation or any other medical reason.
5. Individuals with trauma in left arm.
6. Individuals known to have peripheral arterial disease or diabetes.
7. Any serious health problem arises at the of data collection.

5.9. Variables

5.9.1. Independent variables

Positions(flat feet sitting position and cross-legged sitting position)

5.9.2. Dependent variables

Blood pressure measurement

5.9.3. Demographic variables

Age, gender, chew tobacco, consumption of alcohol, cigarette smoking, food habits, family history of hypertension , chronic health problem at the time of data collection for the study.

5.9.4. Clinical variable

Height , Weight, BMI

6. Ethical consideration

Ethical consideration obtained on 29^{th} May 2019 from the institutional committee, Army Institute of Nursing, C/O151Base Hospital, Guwahati. The participants had been informed about the anonymity and confidentiality of their information. Informed written consent were obtained from the participants.

7. Content Validity and Reliability of The tool

For the validation of the content, it was submitted to 7 specialist and experts from the field Medical - Surgical Nursing . They were requested to verify the items for its clarity, relatedness and meaningfulness and give their opinions and suggestions regarding the items in the tool. The experts were choosen on the basis of their clinical expertise and experience. Suggestions were given by the experts to modify and were incorporated in the tool accordingly.

For validation of the blood pressure instrument OMRON HEM -8712,SERIAL NO 20190604417VG is purchased newly on 09/12/19 to eliminate the observer bias , a copy of signed and stamped warranty card from retailer will be produce by the researcher. The accuracy of this blood pressure monitor has been carefully tested and is designed for a long service life and generally recommended to have the device inspected every two years to ensure correct functioning and accuracy

7.1. Pilot study

The setting of the study was Handigue college, Guwahati Assam. For the pilot study data collection period was 11^{th} December 2019 to 18^{th} December 2019. The study was conducted on 6 samples (Normotensive Young Adults). Collected data were tabulated, analyzed and statistically calculated. The study was found to be effective and feasible to conduct the final study. The reliability was established by using Inter-item Correlation Cronbach's Alpha Based on standardized Items. The reliability of the tool was found r = 0.889 which was considered to be reliable and adequate.

8. Data collection Procedure

After written informed consent, a self structured questionnaire was used to collect the data from the participants. The questionnaire includes demographic characteristics such as age, gender, chew tobacco, consume alcohol, cigarette smoking, food habits, presence of family history of hypertension, any other chronic health problem at present and clinical characteristics such as height ,weight, body mass index.

The blood pressure recorded in both the positions (flat feet and cross leg) after giving instruction for participation informed written consent was obtained from the individuals. Height and Weight were measured using standardized method. The body mass index (BMI) was calculated as the weight in kilograms (with 1 kg subtracted to allow for clothing) divided by height in meters squared.

The blood pressure was recorded by Automated sphygmomanometer, to eliminate the observer bias blood pressure was measured using a validated, newly purchased and fully automated sphygmomanomete, the adult cuff circumference 22-32cm(9-13inch) was available for use. records systolic pressure, diastolic pressure and pulse rate. The machine was reset after each reading [6,7]

9. Statistical Analysis

The data were coded and organized in a master sheet and were analyzed by using the SPSS Version 24. The comparison of mean (paired t –test) to compare the means of blood pressure recorded in flat feet sitting position with cross-legged sitting position. F-Anova test, t — Independent t -test was computed in order to determine the significance of association between the systolic and diastolic blood pressure in flat feet and cross-legged sitting position with demographic and clinical variables. The level $P < 0.05$ was considered as the cutoff value or significance.

10. Organization and Presentataion of Data

The data collected from the subjects were organized and presented for analysis according to the objectives of the study under the following sections-

1. **Section — I** Description of demographic and clinical variables
2. **Section –II** Description of the mean systolic and diastolic blood pressure recorded in flat feet and cross-legged sitting position among normotensive young adults.
3. **Section -III** To examine association of systolic and diastolic blood pressure recorded in flat feet and cross-legged sitting position with selected demographic and clinical variables among normotensive young adults.

11. Results

11.1. Description of variables

11.1.1. Demographic variables

In the present study, the collected data shows that majority 23 (38.3%) of the participants were in the age group 36-40years, 16 (26.7%) of the participants belonged to 31-35 years, 14(23.3%)of the participants belonged to 25-30 years, 7(11.7%) belong to 19 -24 years, male 32(51.6 %) and females 28(45.2%), young adults chew tobacco 12(20%) and 48(80%) do not chew tobacco, young adults consume alcohol 8(12.9%) and 52(83.9%) do not consume alcohol 4(6.5%), young adults do cigarette smoking and 56 (90.3%) ,young adults do not do cigarette smoking , 58(93.5%) young adults take non — vegetarian and 2(3.2%) take vegetarian diet, 14(23.3%) young adults having family history of hypertension and46(76.7%) young adults do not have family history of hypertension , 6(10%) having any chronic health problem at present and 54(90%) do not have any chronic health problem at present.

11.1.2. Clinical variables

Data revealed that height of the majority of the young adults i.e. 29 (48.3%) belong to 149 -160 cms , 14(23.3%) belong 173-184 cms,13(21.7%) belong to 161-172cms and 4(6.7%) belong 136 – 148 ,weight of the majority of the young adults i.e .25 (40.3%) belong to 51-60 kgs ,12(19.4%) belong to 40-50kgs, 11(17.7%) belongs to 61-70kgs, 9(14.5 %) belongs 71-80 kgs and 3(4.8%) belongs to 81-90 kgs, body mass indexBMI of the majority of young adults i.e.40(66.7%)belong to normal weight, 15(25%)belong to overweight ,5(8.3%)underweight category.

11.2. Description of the mean systolic and diastolic blood pressure

The mean difference of systolic blood pressure in flat feet position 109.08±7.510mmHg was lower as compared to mean systolic blood pressure in cross-legged sitting position 111.27±8.809mmHg with mean difference of 2.19 and calculated value (t=4.730, p=0.001) was found statistically significant at p<.05. Hence it is concluded that there is significant difference in average of systolic blood pressure reading recorded in flat feet and cross-legged sitting position so null hypotheses H_{01} is rejected and research hypotheses H1 is accepted.

Mean diastolic blood pressure in flat feet position 73.49±5.066mmHg was lower as compared to mean diastolic blood pressure in cross-legged sitting position 73.82±6.325mmHg with mean difference of 0.33 and calculated value (t=0.308, p=0.225) was found statistically non significant at p<.05. Hence, it is concluded that there is no significant difference in average diastolic blood pressure reading recorded in flat feet and cross-legged sitting position so null hypotheses H_{02} is accepted and research hypotheses H2 is rejected.

12. Examining Association of Blood Pressure with Selected Demographic and Clinical Variables Among Normotensive Young Adults in Flat Feet and Cross-Legged Sitting Positions

There is a significant association between systolic blood pressure in flat feet sitting position with gender (t=3.612,p=0.001), chew tobacco (t=2.600,p=0.012) and height (F=3.296,p=0.027) at p<.05 level of significance The other demographic and clinical variables were found non significant so H3 is accepted.

There is a significant association between systolic blood pressure in cross-legged sitting position with gender (t=3.556,p=0.001) and chew tobacco (t=2.629,p=0.011) at p<.05 level of significance. The other demographic and clinical variables were found non significant so H4 is accepted

There is a significant association between diastolic blood pressure in flat feet sitting position with chew tobacco (t=2.125,p=0.038), height (F=3.535,p=0.021) and BMI (F=5.943,p=0.005) at p<.05 level of significance. The other demographic and clinical variables were found non significant so H5 is accepted.

Table 1: Estimation of mean systolic and diastolic blood pressure recorded in flat feet and cross-legged sitting position among normotensive young adults.

Blood pressure	Position	Mean	SD	Mean-Diff	t value	df	P value
Systolic	Flat feet	109.08	7.510	2.19	4.73059		0.001 S**
	Cross legged	111.27	8.809				
Diastolic	Flat feet	73.49	5.066	0.33	0.30859		0.225 NS
	Cross legged	73.82	6.325				

S * = P< .05 level of significance NS=Not Significant

There is a significant association between diastolic blood pressure in cross-legged sitting position with chew tobacco (t=2.515,p=0.015) and cigarette smoking (t=2.449,p=0.017) at p<.05 level of significance. The other demographic and

Table 2: Association between systolic blood pressure in flat feet sitting position with demographic and clinical variables.

Demographic and clinical variables	N	Mean	SD	F/t value	df	p value
Age in years						
a. 19-24 years	7	106.76	7.492	F=1.036	3	0.384 NS
b. 25-30 years	14	108.43	7.534			
c. 31-35 years	16	107.67	9.279			
d. 36-40 years	23	111.16	5.977			
Gender						
a. Male	32	112.06	5.355	t=3.612	58	0.001
b. Female	28	105.67	8.227			S **
Chew tobacco						
a. Yes	12	113.89	5.526	t=2.600	58	0.012
b. No	48	107.87	7.501			S*
Consume alcohol						
a. Yes	8	111.54	4.840	t=0.997	58	0.323
b. No	52	108.70	7.805			NS
Cigarette smoking						
a. Yes	4	115.42	0.833	t=1.779	58	0.080
b. No	56	108.62	7.571			NS
Food habit						
a. Vegetarian	2	110.67	5.185	t=0.302	58	0.764
b. Non vegetarian	58	109.02	7.603			NS
Family history of HTN						
a. Yes	14	109.43	6.406	t=0.198	58	0.844
b. No	46	108.97	7.876			NS
Chronic health problems						
a. Yes	6	108.72	6.347	t=0.121	58	0.904
b. No	54	109.12	7.679			NS
Demographic and clinical variables	**N**	**Mean**	**SD**	**F/t value**	**df**	**p value**
Height						
a. 136-148	4	108.33	8.278	F=3.296	3	0.027
b. 149-160	29	108.06	7.722			S*
c. 161-172	13	106.15	7.917			
d. 173-184	14	114.12	3.928			
e.						
Weight						
a. 40-50	12	109.47	6.716	F=2.008	4	0.106
b. 51-60	25	106.92	7.656			NS
c. 61-70	11	108.48	9.252			
d. 71-80	9	114.81	2.545			
e. 81-90	3	110.44	6.801			
BMI						
a. Underweigh	5	107.40	7.466	F=2.985	2	0.059
b. t	40	107.80	7.755			NS
c. Normal	15	113.04	5.626			
d. Overweight						

S*=P<.05 level of significance NS=Not significant

Table 3: Association between systolic blood pressure in cross legged sitting position with demographic and clinical variable.

Demographic and clinical variables	N	Mean	SD	F/t value	df	p value
Age in years						
a. 19-24 years	7	109.10	9.361	F=0.992	3	0.403
b. 25-30 years	14	110.48	9.806			
c. 31-35 years	16	109.44	9.381			NS
d. 36-40 years	23	113.70	7.542			
Gender						
a. Male	32	114.73	6.703	t=3.556	58	0.001
b. Female	28	107.32	9.361			S*
Chew tobacco						
a. Yes	12	116.97	7.076	t=2.629	58	0.011
b. No	48	109.85	8.679			S*
Consume alcohol						
a. Yes	8	115.33	5.360	t=1.412	58	0.163
b. No	52	110.65	9.102			NS
Cigarette smoking						
a. Yes	4	118.75	2.167	t=1.790	58	0.079
b. No	56	110.74	8.867			NS
Food habit a. Vegetarian	2	112.83	6.364	t=0.253	58	0.801
b. Non vegetarian	58	111.22	8.918			NS
Family history of HTN						
a. Yes	14	111.95	8.414	t=0.327	58	0.745
b. No	46	111.07	9.006			NS
Chronic health problems						
a. Yes	6	108.72	9.100	t=0.745	58	0.460
b. No	54	111.56	8.818			NS

Demographic and clinical variables	N	Mean	SD	F/t value	df	p value
Height						
a. 136-148	4	113.92	7.923	F=2.578	3	0.063
b. 149-160	29	110.07	9.401			
c. 161-172	13	107.87	9.194			NS
d. 173-184	14	116.17	5.154			
Weight						
a. 40-50	12	113.39	7.180	F=2.260	4	0.074
b. 51-60	25	108.59	9.218			
c. 61-70	11	110.15	10.72			NS
d. 71-80	9	117.85	2.996			
e. 81-90	3	109.56	7.183			
BMI						
a. Underweight	5	112.33	7.721	F=2.054	2	0.138
b. Normal	40	109.73	9.338			
c. Overweight	15	115.0	6.714			NS

S=*P< .05 level of significance NS=Not significant

Table 4: Association between diastolic blood pressure in flat feet sitting position with demographic and clinical variables.

Demographic and clinical variables	N	Mean	SD	F/t value	df	P value
Age in years						
a. 19-24 years	7	73.57	4.122	F=0.109	3	0.955
b. 25-30 years	14	72.83	4.408			
c. 31-35 years	16	73.56	6.926			NS
d. 36-40 years	23	73.83	5.028			
Gender a. Male b. Female	32 28	74.34 72.52	4.929 5.133	t=1.400	58	0.167 NS
Chew tobacco						
a. Yes	12	76.19	2.443	t=2.125	58	0.038
b. No	48	72.82	5.338			S*
Consume alcohol						
a. Yes	8	74.54	3.385	t=0.625	58	0.535
b. No	52	73.33	5.284			NS
Cigarette smoking						
a. Yes	4	76.92	2.699	t=1.410	58	0.164
b. No	56	73.25	5.120			NS
Food habit						
a. Vegetarian	2	71.83	4.950	t=0.469	58	0.641
b. Non vegetarian	58	73.55	5.102			NS
Family history of HTN a. Yes	14	73.31	5.739	t=0.155	58	0.878
b. No	46	73.55	4.911			NS
Chronic health problems						
a. Yes	6	72.11	4.350	t=0.702	58	0.485
b. No	54	74.65	5.152			NS

Demographic and clinical variables	N	Mean	SD	F/t value	df	P value
Height						
a. 136-148	4	67.67	7.741	F=3.535	3	0.02
b. 149-160	29	73.29	5.405			1
c. 161-172	13	72.90	4.444			S*
d. 173-184	14	76.14	1.743			
Weight						
a. 40-50	12	72.92	7.588	F=0.908	4	0.46
b. 51-60	25	72.53	4.524			6
c. 61-70	11	73.76	5.145			NS
d. 71-80	9	75.74	1.516			
e. 81-90	3	76.11	2.524			
BMI						
a. Underweight	5	67.53	6.711	F=5.943	2	0.00
b. Normal	40	73.36	5.100			5
c. Overweight	15	75.84	2.039			S*

S*=P< .05 level of significance NS=Not significant

Table 5: Association between diastolic blood pressure in cross legged sitting position with demographic and clinical variables.

Demographic and clinical variables	N	Mean	SD	F/t value	df	P value
Age in years						
a. 19-24 years	7	72.21	4.648	F=0.277	3	0.841
b. 25-30 years	14	73.02	7.175			
c. 31-35 years	16	73.75	6.665			NS
d. 36-40 years	23	74.68	6.253			
Gender						
a. Male	32	75.12	5.773	t=1.742	58	0.087
b. Female	28	72.32	6.693			NS
Chew tobacco						
a. Yes	12	77.75	3.397	t=2.515	58	0.015
b. No	48	72.83	6.525			S*
Consume alcohol						
a. Yes	8	74.04	5.184	t=0.107	58	0.915
b. No	52	73.78	6.525			NS
Cigarette smoking a. Yes	4	81.0	6.538	t=2.449	58	0.017
b. No	56	73.30	6.046			S*
Food habit						
a. Vegetarian	2	70.0	1.886	t=0.866	58	0.390
b. Non vegetarian	58	73.95	6.386			NS
Family history of HTN						
a. Yes	14	75.33	7.072	t=1.025	58	0.310
b. No	46	73.36	6.088			NS
Chronic health problems						
a. Yes	6	70.33	6.157	t=1.435	58	0.157
b. No	54	74.20	6.279			NS

Demographic and clinical variables	N	Mean	SD	F/t value	df	P value
Height						
a. 136-148	4	71.33	7.855	F=2.061	3	0.116
b. 149-160	29	73.07	7.062			
c. 161-172	13	72.49	5.429			NS
d. 173-184	14	77.31	3.826			
Weight						
a. 40-50	12	73.58	6.662	F=1.199	4	0.322
b. 51-60	25	72.67	6.878			NS
c. 61-70	11	72.91	6.054			
d. 71-80	9	77.56	3.543			
e. 81-90	3	76.44	6.336			
BMI						
a. Underweight	5	70.73	6.934	F=2.748	2	0.073
b. Normal	40	73.07	6.650			NS
c. Overweight	15	76.84	4.104			

S*=P<.05 level of significance NS=Not significant

clinical variables were found non significant so H6 is accepted.

13. Discussion

Sitting flat feet position while Blood pressure recording is essential for young adults ,the systolic blood pressure is significantly associated with gender and chewing tobacco in both the positions and the diastolic blood pressure is significantly associated with chewing tobacco and cigarette smoking.and BMI in both the positions.

A study conducted by Pinar R, Sabuncu N,Oksay A(2004) on the effects of crossed leg on blood pressure among an unmedicated high –normal blood pressure stage 1 or stage 2 hypertensive subjects, mean± SD systolic BP in leg uncrossed 145.12±20.33mmHg and leg crossed was 153.62±20.20mmHgrespectively,diastolic blood pressure in leg uncrossed =86.38±10.81mmHg and leg crossed was 92.10 ±11.20 mmHg respectively.[8]

Also, a study done by Das N, Sharma A(2019) on a comparative a study to assess the effect of standing position and sitting crossed leg position on blood pressure among faculties of Charusat Changa Gujrat, mean ±SD systolic BP standing and crossed leg position was 121.9±7.2mmHg and 123.9±7.6mmHg respectively, diastolic blood pressure in standing position and crossed leg position was 81.2±5.9mmHg and 84.3±4.4mmHg respectively.[9]

The present study evaluated the mean systolic and diastolic blood pressure recorded in flat feet and cross-legged sitting position among normotensive young adults, the result indicates mean, SD systolic blood pressure found in flat feet = 109.07±7.44mmHg, cross-legged = 111.27±7.44mmHg, distolic blood pressure in flat feet = 73.49±5.02mmHg, distolic blood pressure in cross-legged = 73.81±6.2mmHg.

In a study conducted by Peters GL, Binder SK, Campbell NR (1999) on the effect of crossing legs on blood pressure among fifty healthy volunteers and 53 patients with hypertension. The study shows crossing legs increased systolic blood pressure but little effect on diastolic blood pressure. The cardiovascular risk class increased for a large number of the hypertensive patients but for fewer of the normotensive patients.

Fitzpatrick FL, Ortiz A, Sibilant H, MarcantonioR, Braun TL(1999)on the effects Of Crossed Leg On Blood Pressure Measurement.the result indicate both systolic and diastolic blood pressure increased significantly ($p<0.0001$)with the crossed leg position.[9]

The physiological mechanism for the rise in BP with leg crossing is a translocation of blood volume from the dependent vascular beds to the thoracic compartment Although there is a theoretical basis for crossing legs to increase BP, there are controversial published data addressing this question.[10]

In the present study, the mean systolic blood pressure compared by using Paired t-test shows significant difference in systolic blood pressure recorded in flat feet and crossed leg sitting position.

Present study findings are consistent with the study conducted by AvvampatoCS (2001)on effect of one leg crossed over the other at knee on blood pressure in hypertensive patients among 90 patient who regularly scheduled clinic visit. The study showed no statistically significant difference in BP readings of subjects with one leg crossed over the other versus both feet on floor.[11]

In the present study, the mean diastolic blood pressure Paired t-test shows no significant difference in diastolic blood pressure recorded in flat feet and crossed leg sitting position.

Present study findings are supported by study conducted by Nickson Das and Dr. AnilSharma(2018) on a comparative study to assess the effect of standing position and sitting crossed leg position on blood pressure among faculties of Charusat, Changa, Gujrat. The study revealed that the variables age, gender, height, BMI, diet habit, consumption of junk food has significant association with standing position and sitting crossed leg position.[8]

In the present study, while assessing the association between flat feet blood pressure and cross-legged sitting position blood pressure with selected demographic and clinical variables among normotensive young adults result the association between systolic and diastolic blood pressure in flat feet and cross-legged sitting position with demographic and clinical variables which was tested by using Anova test and independent t test.

14. Conclusion

There is a significant difference in systolic blood pressure but insignificant difference in diastolic blood pressure when legs were crossed at knee level while taking blood pressure among normotensive young adults.

15. Source of funding

None

16. Conflict of Interest

None

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