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# COMPARISON OF PHYSICAL ACTIVITY AND BLOOD PRESSURE IN YOUNG ADULT MALE RESIDENT DOCTORS IN A METROPOLITAN CITY

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**Abstracts**:

**Aim:** To check the relationship between physically inactive or less active people with arterial blood pressure.

**Method:**

The study was conducted on young adult male resident doctors aged between 25-45 years. A total of 120 subjects were enrolled for the study. Blood Pressure was taken and physical activity was evaluated by Godin-Shephard leisure time Physical Activity Questionnaire.

**Results:**

Our results showed that systolic and diastolic blood pressure were higher in insufficiently active groups as compared to active and moderately active groups.

**Conclusion:** Increased blood pressure for long duration causes hypertension and hypertension is more common in case of physically inactive people.

**Key Words**: Blood pressure, Physical activity level, Male young resident, Metropolitan city

## Introduction:

Morbidity and mortality from cardiovascular diseases is prevalent in this modern world.[1] Of all the deaths that happen every day in our country cardiovascular diseases play an important role in that.[2] Increased blood pressure or hypertension is one of the most important reasons for cardiovascular disease.[3] It has been observed that performing daily exercises or physical activity is inversely proportional to hypertension.[4] This is the reason that physical activity has become an important aspect in this modern world. In recent years doing daily exercises or physical activity has become quite popular. [5,6] Evidence has been found that there is an independent association of prevention of cardiovascular disease with physical activity. [7,8]
Gradual increase in blood pressure is harmful for the heart as well as blood vessels. Rise in blood pressure or hypertension not only causes concentric hypertrophy of the heart muscle or myocardium, it causes steady decrease of the ejection fraction which eventually leads to cardiac failure. [9-11] Also long-term hypertension is associated with atherosclerosis, which gradually damages the walls of the blood vessels. [12,13]
Doing regular exercise or physical activity gives us several benefits. It helps in release of the hormone endorphins which elevates our mood. [14] Regular exercises increase muscle strengths as well as decrease body fat percentage. [15,16] Doing consistent physical activity increases blood circulation especially in the coronary arteries. This benefits the myocardium of the heart which affects the longevity of our life. [17]

## Material and Methods:

This was an observational and cross-sectional study, conducted in the Department of Physiology, Seth G.S. Medical College and K.E.M. Hospital, Parel, Mumbai, India. The study was previously approved by the Institutional Ethics Committee (IEC). The study participants were recruited from the K.E.M. Hospital. To Decrease bias the study participants were chosen randomly. After thorough counselling, 120 subjects were selected, among which some were insufficiently active, some were moderately active and rest of them were active. They were divided into 3 groups according to their score after asking them a standard questionnaire. A total of 120 study participants (all of them were male) were recruited for the study. The participants were then sub categorised into following three groups on the basis of their score after asking them questions from the standard questionnaire. Physical Activity was evaluated by Godin-Shephard leisure-time Physical Activity Questionnaire which was validated by Miller DJ. The questionnaire allows the assessment of self-reported leisure-time physical activity. [18,19]
The subjects were categorised accordingly into **Three groups-**

- Group A = Insufficiently Active group < 14
- Group B = Moderately Active group 14 - 23
- Group C = Active group > 23

Sphygmomanometer, Pretested Proforma were used for this study.
The participants were asked to come to the Department of Physiology in the morning after having a light breakfast. After informed consent, blood pressure was measured and Proforma were filled accordingly. History taking, general examination and systemic examination were done before the starting of actual procedure.

## Statistical analysis:

Data of the different parameters measured were entered in Microsoft Excel (2010). The mean and standard deviation was calculated for all the parameters. Statistical analysis was done using n-Master 1.0 as per SPSS 16.0

and Graph Pad Prism software. The statistical tests used were as per data requirement and our objectives of the study. Data was presented as Mean ± Standard deviation.
The data was analysed statistically using the Post Hoc Bonferroni's multiple comparison test. P value <0.05 was considered significant for all statistical analysis, moderately significant if P<0.01 and highly significant if P<0.001. Confidence interval was calculated as 95%.

## Result:

Total 120 subjects were divided into three groups according to their score after asking them the Godin-Shephard leisure-time Physical Activity Questionnaire.
The groups were as follows.

**Table no. 1: Total number of subjects involved in the study**.

| Groups | Insufficiently Active | Moderately Active | Active | Total |
|---|---|---|---|---|
| **No of subjects** | 59 | 39 | 22 | 120 |

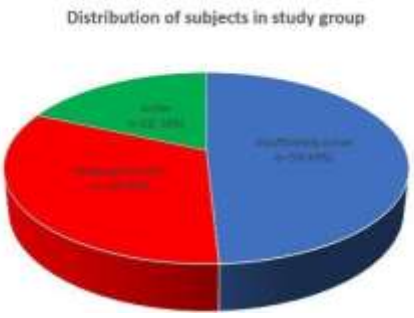


**Figure no. 1: Distribution of subjects in Insufficiently Active, Moderately Active and Active groups.**

**Table no. 2: Comparison of Age between Group A, Group B and Group C**

| Parameter | Insufficiently Active (n=59) | | Moderately Active (n=39) | | Active (n=22) | | p-value |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | |
| **Age (Years)** | 30.86 | 4.30 | 30.36 | 4.75 | 31.82 | 5.46 | >0.05 |

- Group A (Insufficiently Active group) consisted of 59 resident doctors, whose age ranges from 25 to 45 years. The mean age in Group A is 30.86 (± 4.30) years.
- Group B (Moderately Active group) consisted of 39 resident doctors, whose age ranges from 25 to 45 years. The mean age in Group B is 30.36 (± 4.75) years.
- Group C (Active group) consisted of 22 resident doctors, whose age ranges from 25 to 45 years. The mean age in Group C is 31.82 (± 5.46) years.

- The difference in mean values of Age (p-value>0.05) was not statistically significant in the three groups. The groups were comparable with respect to age.

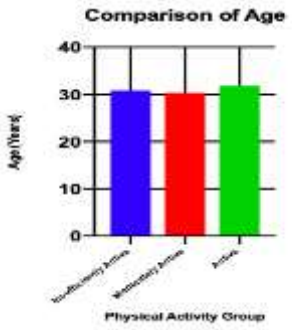


**Figure no. 2: Comparison of Age (Years) among Group A, B and C.**

**Table no. 3: Comparison of Systolic Blood Pressure (SBP) among Insufficiently Active, Moderately Active and Active Groups.**

| Parameter | Insufficiently Active (n=59) | | Moderately Active (n=39) | | Active (n=22) | | p-value |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | |
| SBP (mm of Hg) | 122.20 | 6.78 | 119.13 | 5.19 | 116.09 | 7.67 | <0.05 |

**Systolic Blood Pressure of Group A is 122.20 ± 6.78 mm of Hg, Group B is 119.13 ± 5.19 mm of Hg and Group C is 116.09 ± 7.67 mm of Hg**

**The comparison of Systolic Blood Pressure between Group A, Group B and Group C came out as statistically significant with the ANOVA test as p value <0.05**

**Table no. 4: Comparison of Systolic Blood Pressure among Insufficiently Active, Moderately Active and Active Groups using Post Hoc Bonferroni's multiple comparison test.**

| Groups | t-value | p-value |
|---|---|---|
| Insufficiently Active v/s Moderately Active | 2.30 | >0.05 |
| Insufficiently Active v/s Active | 3.77 | <0.05 |
| Moderately Active v/s Active | 1.75 | >0.05 |

- After applying ANOVA test, the mean value of Systolic Blood Pressure is higher in Insufficiently Active group as compared to Moderately Active group which is statistically not significant.
- Mean value of Systolic Blood Pressure is higher in the Insufficiently Active group as compared to Active group and the difference is statistically significant.
- Mean value of Systolic Blood Pressure is higher in the Moderately Active group as compared to Active group which is not statistically significant.

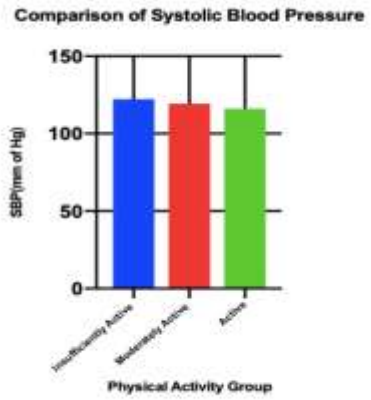


**Figure no. 2: Comparison of Systolic Blood Pressure among Insufficiently Active, Moderately Active and Active Groups.**

**Table no. 5: Comparison of Diastolic Blood Pressure among Insufficiently Active, Moderately Active and Active Groups.**

| Parameter | Insufficiently Active (n=59) | | Moderately Active (n=39) | | Active (n=22) | | p-value |
|---|---|---|---|---|---|---|---|
| | Mean | SD | Mean | SD | Mean | SD | |
| DBP (mm of Hg) | 79.69 | 5.81 | 75.44 | 5.33 | 76.27 | 5.77 | <0.05 |

- **Diastolic Blood Pressure of Group A is 79.69 ± 5.81 mm of Hg, Group B is 75.44 ± 5.33 mm of Hg and Group C is 76.27 ± 5.77 mm of Hg**
- **The comparison of Diastolic Blood Pressure between Group A, Group B and Group C came out as statistically significant with the ANOVA test as p value <0.05**

**Table no. 6: Comparison of Diastolic Blood Pressure among Insufficiently Active, Moderately Active and Active Groups using Post Hoc Bonferroni's multiple comparison test.**

| Groups | t-value | p-value |
|---|---|---|
| Insufficiently Active v/s Moderately Active | 3.65 | <0.05 |
| Insufficiently Active v/s Active | 2.42 | <0.05 |

| | | |
|---|---|---|
| **Moderately Active v/s Active** | 0.56 | >0.05 |

- After applying ANOVA test, the mean value of Diastolic Blood Pressure was higher in the Insufficiently Active group as compared to Moderately Active group which was statistically significant.
- Mean value of Diastolic Blood Pressure was higher in the Insufficiently Active group as compared to the Active group and the difference was statistically significant.
- Mean value of Diastolic Blood Pressure was lower in Moderately Active group as compared to the Active group which was not statistically significant.

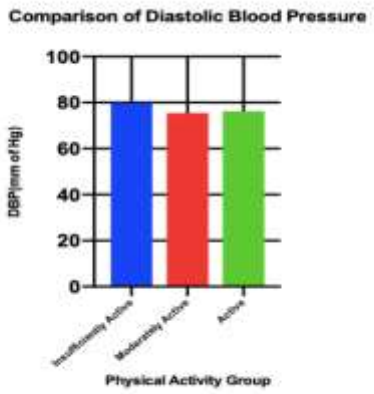


**Figure no. 3: Comparison of Diastolic Blood Pressure among Insufficiently Active, Moderately Active and Active Groups.**

## Discussion:

Importance of daily exercise or regular physical activity is increasing day by day. People have understood the significance of their health. To maintain good health, it is essential to exercise regularly.

Carpio-Rivera et al had shown in their study that if a person has been doing regular exercises, the chance of hypertension is significantly decreased. Physical activities reduce the risk of hypertension significantly. [20]

Susana Lopes et al had shown in their study that the regular exercises is not only beneficial against the risk of hypertension it also has significant effect on the resistant hypertension. [21]

Sheila Hegde et al had shown that while exercise and hypertension can both be associated with the development of left ventricular hypertrophy (LVH), the cardiac remodelling from hypertension is pathologic with an associated increase in myocyte hypertrophy, fibrosis, and risk of heart failure and mortality, whereas LVH in athletes is generally non-pathologic and lacks the fibrosis seen in hypertension. In hypertensive patients, physical activity has been associated with paradoxical regression or prevention of LVH, suggesting a mechanism by which exercise can benefit hypertensive patients. [(22)]

In our present study we have seen similar results. Though we have found that the systolic blood pressure and the diastolic blood pressure in all the three groups are within normal limits, but the mean value of SBP as well as DBP is maximum in the Inactive group, whereas it is minimum in case of Active group. The Moderately Active group comes somewhat in between them. The increased level of SBP & DBP may seem to be normal in the Inactive & Moderately Active groups but eventually it might be leading to hypertension causing both morbidity and mortality.

**Conclusion:**

From this present study we can conclude that,

- In today's world the importance of daily physical activity is immense.
- Inactive people (according to daily physical activities) tend to have high blood pressure compared to Active people.
- Increased blood pressure eventually might lead to development of hypertension in future.

**Limitations:**

- The study population is not very big.
- No female subjects were included in this study.

**Acknowledgement:**

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