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Correlation of blood pressure and physical activity among teachers in ISRA University

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Abstract

Background: High blood pressure or hypertension, often referred to as the ‘silent killer’, is typically asymptomatic – meaning no symptoms are shown. Some people with high blood pressure will experience symptoms, including chest pain, dizziness, headaches, shortness of breath, palpitations, and heart and nose bleeds. The first step to preventing and managing high blood pressure is to understand high blood pressure, its causes, effects, and long-term consequences.

Objective: To compare the blood pressure and physical activity among teachers of Isra university in Hyderabad.

Methodology: A cross sectional study was performed on 1075 teachers, randomly selected male and females from different department of Isra University Hyderabad. This study held from July 2020 to December 2020.

Results: 1075 teachers fill the questionnaire. The prevalence of hypertension among teachers in total population was 40%.

Conclusion: It is concluded from the study that prevalence of hypertension was high among teachers but no correlation was found between blood pressure and physical activity of participants.

Keywords: Blood pressure, physical activity, silent killer

Introduction

Blood Pressure

High blood pressure or hypertension, often referred to as the ‘silent killer’, is typically asymptomatic – meaning no symptoms are shown. Some people with high blood pressure will experience symptoms, including chest pain, dizziness, headaches, shortness of breath, palpitations, and heart and nose bleeds. The first step to preventing and managing high blood pressure is to understand high blood pressure, its causes, effects, and long-term consequences.^[1]. Blood pressure is a measurement of the force of blood which pushes against the walls of the arteries. High blood pressure or hypertension is a medical condition in which the arteries are persistently subjected to an elevated blood pressure. This increased pressure is caused by a rise in the force of blood pushing against the walls of the arteries. The increased pressure can be caused by the arteries becoming thicker or hardening due to the build-up of plaque^[1].

The Causes, Types and Stages of High Blood Pressure

There are some unchangeable factors as well as some changeable factors that contribute to high blood pressure. In general, unchangeable factors that can be the root cause of high blood pressure include age, sex, ethnicity, family history and the person’s medical history. Changeable factors which also have an impact on high blood pressure include diet, exercise routine, and stress management. NSAIDs that can be purchased over-the-counter include: (Brand Name) – Generic Name (Advil, Motrin) – Ibuprofen (Aleve) – Naproxen Sodium (Ascriptin, Bayer, Ecotrin) – Aspirin^[1].

Different Stages of High Blood Pressure

Prehypertension: Individuals considered to fall under the prehypertension classification are strongly encouraged to adapt health-promoting lifestyle changes/modifications.

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Stage 1 Hypertension: During this stage, defined by a constriction of arteries or an increase in blood volume, high blood pressure is reversible.

Stage 2 Hypertension: During this stage, characterized by the permanent thickening of the blood vessels, high blood pressure is irreversible without the use of medication.

Stage 3 Hypertension: This is a hypertensive emergency.

The instrument used for measuring blood pressure is called a sphygmomanometer^[1].

Physical Activity

Physical activity is movement of the body caused by skeletal muscle contractions and it includes:

Light-Intensity Activities (less than 3.0 METs)

Walking at less than 3 miles per hour Bicycling less than 5 miles per hour Performing stretching exercises Playing golf at a driving range Participating in lawn bowling Playing horseshoes Riding a horse at the horse's walking pace Performing light housework^[2].

Moderate-Intensity Activities (3.0-5.9 METs)

Walking at 3.0 to 4.5 miles per hour bicycling on level terrain at 5 to 9 miles per hour Performing yoga participating in recreational dancing, such as square dancing walking a golf course^[2].

Vigorous-Intensity Activities (6.0 METs and above)

Race walking, Jogging and running Bicycling at 10 miles per hour or higher or bicycling uphill Jumping rope. Specific types of physical activity (e.g., walking, swimming, lifting weights^[2].

Aerobic exercise or cardiovascular activities increase the body's ability to use oxygen as a source of fuel for sustained work. Flexibility activities increase range of motion of joints and the distance a muscle can be stretched. Balance activities increase the stability of the body as it adopts various positions and does tasks, such as standing and walking^[2].

Current Physical Activity Guidelines for Older Adults The key guidelines for older adults (65 years and older) from the 2008 Physical Activity Guidelines for Americans are shown in the sidebar. Older adults with no chronic health conditions should follow the adult guidelines. Older adults with one or more chronic conditions should talk with their health care provider to determine whether their condition limits their ability to perform regular physical activity. Such a conversation may help people learn about appropriate types and amounts of physical activity. When older adults cannot meet the guidelines because of health conditions, they should be as physically active as their condition will allow. Healthy older adults generally do not need to consult a health care provider before initiating moderate-intensity physical activity. However, health care providers can help people attain and maintain regular physical activity by providing advice on appropriate types of activities and ways to progress at a safe and steady pace. Intensity Older adults should use relative intensity to gauge their level of effort while being active, where the level of effort required to perform an activity is relative to a person's level of cardiorespiratory fitness^[2].

Material and Method

1. Study Design

The cross-sectional research survey was undertaken for comparison of blood pressure and physical activity among teachers in Isra University.

2. Participant recruitment

Participant was recruited from Isra University Hyderabad.

3. Duration of study

Duration of study was 6 month after the acceptance of proposal

4. Sampling technique

Respondent selected in this study by convenience sampling.

5. Sample size

1075 participant were selected

6. Sample selection

Inclusion criteria

All teachers from different department of Isra University was selected.

Participate willing to participate in this study.

Exclusion criteria

Other than teachers all staff was excluded.

Participants with less than 1 year of experience was excluded.

1. Data collection method

The data was collected by distributing questionnaire.

2. Data collection tools

The tool for collecting the data is "International Physical Activity questionnaire" for measuring physical activity level of participants and Sphygmomanometer (ATOM) to measure blood pressure of the participants.

6. Data analysis

For evaluation of data SPSS version 20 was used. Correlation test was applied to check the relation between two variables, and Mean values of individual variables was described.

4. Budget

The amount of budget for the study was around RS 10000 (self-finance).

5. Ethical consideration

After approval from departmental ethical review committee, consent form was attached to the questionnaire and participation privacy was maintained. Data used for the research purpose only and their data will be kept confidential and anonymous.

Results

In this survey 67% of the participants were between the age range of 21 to 30 year, 14% of the participants were between age range of 31 to 40 years, 15% of the participants were between age range of 41 -50 years, and 4% of the participants were between age range of 51 to 60 years as shown in the table and figure 1.

In this survey male participants were 58% and female participants 42% as shown in the table and figure IV-2.

Regarding level of mean arterial pressure 62% of the participants had normal MAP and 38% of the participants had low MAP as shown in the table and figure 3.

Regarding physical activities during last 7 days, 33 participants perform vigorous physical activity with mean value of 3.87 and SD 1.57, 28 participants perform moderate physical activities with mean value of 2.50 and SD 1.52, 61 participants perform walking with mean value of 5.03 and SD 1.77 and 64 participants spent sitting on week days with mean

value of 5.82 and SD 3.127 hours as shown in the table 4. Regarding time spent of physical activities, 33 participant's spent mean value of 3.65 hours with SD of 4.57, 28 participants spent mean value of 1.24 hours with SD of 0.83 and 61 participant's total time of walking with mean value of 2.27 hours and SD 2.27 as shown in the table 5.

Correlations Test for participants who perform Vigorous PA with Mean Arterial Pressure states that there was positive correlation, R value was -0.208 but the p-value was not significant which is 0.245 as shown in the table 6.

Regarding mean value of participants who perform vigorous PA, moderate PA, Walking and their sitting hours was Mean of Vigorous PA Days was 3.9 and Mean of Vigorous PA Time (hours) was 3.3. Mean of Moderate PA Days was 1.9 and Mean of Moderate PA Time (hours) was 1.0. Mean of Walking days was 4.7 and Mean of Walking Hours was 2.4 and their Mean of sitting hours was 5 as shown in the table 7. Correlations Test for participants who perform moderate PA with Mean Arterial Pressure states that there was correlation value of 1, R (correlation coefficient) value was -0.064 but the p-value was not significant which was 0.737 as shown in the table 8.

Regarding mean value of participants who perform moderate PA, Walking days and time and their sitting hours, Participants Mean of Moderate PA Days was 2.25 with Mean of Moderate PA Time (hours) was 1.5. Their mean of walking days was 5 with mean of walking hours was 7 and their mean of sitting hours was 2 as shown in the table 9.

Correlations test for participants who (do not perform vigorous and moderate physical activities) walk with mean

arterial pressure states that there was correlation value of 1, R (correlation coefficient) value was -0.006 but the p-value was not significant which was 0.966 as shown in the table 10. Regarding mean value of participants who (do not perform vigorous and moderate physical activities) walk and their sitting hours, participants mean of walking days was 5 and walking hours was 7 and their mean of sitting hours was 2 as shown in the table 11.

Table 1: Age of participants

	Frequency	Percent
Valid	21-30 Years	670
	31-40 Years	140
	41-50 Years	150
	51-60 Years	115
	Total	100

Table 2: Gender of participants

	Frequency	Percent
Valid	Male	580
	Females	495
	Total	100

Table 3: Mean arterial Pressure of participants

	Frequency	Percent
Valid	Normal (70-100)	620
	High (more than 100)	455
	Total	100

Table 4: Mean values of hours of vigorous physical activities, moderate physical activities, walking and sitting

	Mean	Std. Deviation
During last 7 days, how many days did you do vigorous physical activities?	3.8788	1.57634
During last 7 days, how many days did you do moderate physical activities.	2.50	1.528
During last 7 days, how many days did you walk for at least 10 minutes at a time	5.03	1.770
During last 7 days, how much time did you spent sitting on week days while at work at home while doing course work and during leisure time.	5.82	3.127

Table 5: Correlations Test for participants who perform Vigorous PA With Mean Arterial Pressure

	Vigorous PA	MAP
Vigorous PA	Pearson Correlation	1
	Sig. (2-tailed)	.245
	N	330
MAP	Pearson Correlation	-.208
	Sig. (2-tailed)	.245
	N	330

Table 6: Correlations Test for participants who perform moderate PA With Mean Arterial Pressure

	During last 7 days, how many days did you do moderate physical activities.	MAP
During last 7 days, how many days did you do moderate physical activities.	Pearson Correlation	1
	Sig. (2-tailed)	.737
	N	300
MAP	Pearson Correlation	-.064
	Sig. (2-tailed)	.737
	N	300

Table 7: Correlations Test for participants who (do not perform vigorous and moderate physical activities) Walk With Mean Arterial Pressure

	During last 7 days, how many days did you walk for at least 10 minutes at a time	Blood Pressure of participants
During last 7 days, how many days did you walk for at least 10 minutes at a time	Pearson Correlation	1
	Sig. (2-tailed)	.966
	N	445

Blood Pressure of participants	Pearson Correlation	-.006	1
	Sig. (2-tailed)	.966	
	N	445	445

Discussion

In this survey 100 teachers participated in 58% were male and 42% were female, with age range of 22 to 60 years. Correlation test was used to compare the Mean arterial pressure and physical activity level of participants.

It was found that there was no correlation between participants vigorous and moderate physical activity level and mean arterial pressure as the p value was >0.005.

In this survey only 33% of the participants were doing vigorous physical activity and 28% were doing only moderate level of physical activity and 61% of the participants were doing low level of physical activity. Monteiro *et al.* [28] reported 47.4% of low physical activity level in 2,122 people in 2005 while data from the Brazilian Ministry of Health (2009) showed a prevalence of 25.6%. Matsudo *et al.* [29] assessed physical activity level using IPAQ in 2,001 individuals from 29 cities in the state of São Paulo and reported that 8.8% were sedentary. Similar results were reported by Hallal *et al.* [30] they studied leisure-time physical activity level in 2,348 individuals in São Paulo and found 8.9% prevalence of low physical activity level. The Brazilian Ministry of Health evaluated sedentary and irregularly active individuals as a single group called insufficiently active and found a prevalence of 35.4% of inadequate physical activity level. Using the same approach, Rocha [31] estimated that 56.4% of the population in the southern area of the city of São Paulo were insufficiently active.

In this study 62% of the participants had normal level of blood pressure and 38% of the participants had high blood pressure. Another study conducted by G.K mini *et al.* [5] states 14.6% prevalence of hypertension, which was much lower than that reported from general population (30%) in the state [32]. School teachers in Saudi Arabia [33] reported a hypertension prevalence of 25%. Hypertension prevalence in the age group of 45-54 years (39.8%) reported from general population in India [34] was higher than the study results of 25.6% hypertension prevalence in the same age group [5]. A nationally representative study among 1.3 million adults (18 years and above) in India reported a hypertension prevalence of 25.3% [35].

Conclusion

It is concluded that there was poor correlation among teacher's physical activity level and blood pressure but it was found that there was high prevalence of hypertension among teachers.

Recommendation

It is recommended that this study should be conducted on larger sample size. There should be an awareness program for teachers to control their blood pressure.

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