

**Original Article**

**Impact of Education and Physical Activity on awareness and control of Hypertension**

Farwa Rizvi, Muhammad Afzal, M. Ashraf Chaudhry, Atif Baig

**ABSTRACT**

**Objective**

To determine the impact of education and physical activity on the awareness and control of systolic and diastolic blood pressure (BP) in hypertensive patients of Islamabad.

**Methods**

A total of 240 patients were selected consecutively from Cardiology OPD of PIMS, Polyclinic and Medical OPD of PAEC Hospital Islamabad, from April 2006 to September 2006 for this multi-center cross-sectional survey. Information regarding the socio-demographic profile as well as their level of physical activity (30 minutes brisk walk five times /week) was gathered through a structured questionnaire.

**Results**

Out of 240 patients, 123 (51.25%) were males and 117 (48.75%) were females. 80/123 (65%) males and 63/117 (54%) females replied that they did physical activity regularly. 99% of who did physical activity had normal B.P values and 64% of who did no physical activity (97/240 patients) were in pre-hypertension stage (P=0.000). As the education level increased, the proportion of physical activity also increased significantly (P= 0.000).

**Conclusion**

Level of education and physical activity especially walking for 30 minutes at least five days per week has a significant role in reducing and controlling blood pressure in patients with and without medication. (Rawal Med J 2009;34: ).

## **Key Words**

Hypertension, diastolic blood pressure, systolic blood pressure, physical activity.

## **INTRODUCTION**

Hypertension is estimated to cause 4.5% of current global disease burden and is as prevalent in many developing countries as it is in the developed world.<sup>1</sup> Hypertension is defined as a blood pressure level  $\geq 140$  mm Hg systolic and/or 90 mm Hg diastolic and/or taking antihypertensive medication.<sup>2</sup> Together with smoking, diabetes and dyslipidemia, hypertension constitutes an important risk factor for cardiovascular diseases, which are responsible for about 30% of deaths around the world.<sup>3</sup> The first measure in all over-weight hypertensives is weight reduction and even if the ideal weight is not reached, this results in a lasting decrease in blood pressure.<sup>4</sup> Among aspects inherent to the patients, variables like age, gender, ethnic origin, education level, socioeconomic level, occupation, civil status, living habits, health beliefs, knowledge and attitudes towards treatment stand out.<sup>5</sup> Physical inactivity is a major risk factor for cardiovascular health, including hypertension.<sup>6</sup> All current treatment guidelines for hypertension emphasize the role of physical activity in the treatment of hypertension.<sup>7-9</sup>

Moderate intensity activity for most people is comparable to a brisk walking pace of 4.5 to 6 km per hour, and high intensity activity is comparable to jogging or running.<sup>10</sup> Increasing awareness and simple preventive measures such as promotion of physical activity, reducing body weight and reduction of salt intake present the best hope for reducing the impact of hypertension on morbidity and mortality.<sup>11</sup> The aim of our study was to determine the impact of education and physical activity on the awareness and control of systolic and diastolic BP in hypertensive patients of Islamabad.

## **SUBJECTS AND METHODS**

This multi-center cross-sectional study was conducted in three centers namely, the Medical outpatient department of PAEC Hospital, Cardiology outpatient department of PIMS and Polyclinic hospital from April 2006 to September 2006. A total of 240 patients, according to epi-info for 99 % CI and 1% error were selected by consecutive sampling technique. According to the outpatient turnover, 115 patients from PIMS, 100 from Polyclinic, and 25 from PAEC were selected. Informed written consent was taken. Patients of essential hypertension above 25 years who were on regular antihypertensive medication and those who were on irregular medication/no medication, without any other co-morbid diseases and who were non-smokers were included in the study.

A brief history regarding socio-demographic profile, level of physical activity (30 minutes brisk walk at least 5 days per week), and duration of hypertension since diagnosis was taken through a structured questionnaire. Brief clinical examination was done and a mean of 3 BP readings taken at 10 minutes interval was taken. BP was taken by mercury sphygmomanometer with the cuff width of 14.5 cm and range 25.4 – 40.6 cm. The reading was taken from the left arm in the sitting position. It was ensured that the patients had not taken any caffeine-containing beverages or smoked for at least two hours before BP was measured.

SPSS version 13.0 was used for statistical analysis. Independent sample t-test was used to compare systolic and diastolic B.P in patients with and with out physical activity who were taking medication regularly and who were not on medication. Chi-square test was used to find any association of physical activity with age, gender and education.

## RESULTS

The mean age in years was 42.24 years; mean weight in Kilograms was 73.44 Kg and mean height was 169 cm. Out of 240 patients, 123 (51.25%) were males and 117 (48.75%) were females. The Blood Pressure ranges (categories) were pre defined according to JNC (Joint National Criteria) and were as follows: Normal: 120/80 mmHg, Pre Hypertension: 120-139/80-89 mmHg, Stage 1 Hypertension: 140-159/90-99 mmHg and Stage 2 Hypertension: 159/>99 mmHg.

**Table 1. Cross tabulation between gender and physical activity**

Gender	Physical Activity*			Total
	YES	NO	DNK**	
Male	80 (65%)	41 (33.33%)	2 (1.6%)	123 (51.25%)
Female	63 54%	52 44.4%	2 1.7%	117 (48.75%)

\*Physical Activity = 30 minutes of brisk walk at least 4 times a week \*\* DNK = Do not know

Among the male patients, 80 (65%) patients answered yes for physical activity and 33.33% said no. In the female patients 63 (54%) answered yes and 52 (44.4%) said no (no physical activity). (Table 1) The systolic and diastolic BP was significantly ( $P=0.000$ ) different in patients with and with out physical activity who were on regular medication. Similarly, BP was also significantly ( $P=0.000$ ) different in hypertensive patients with and without regular exercise who were not taking medication.

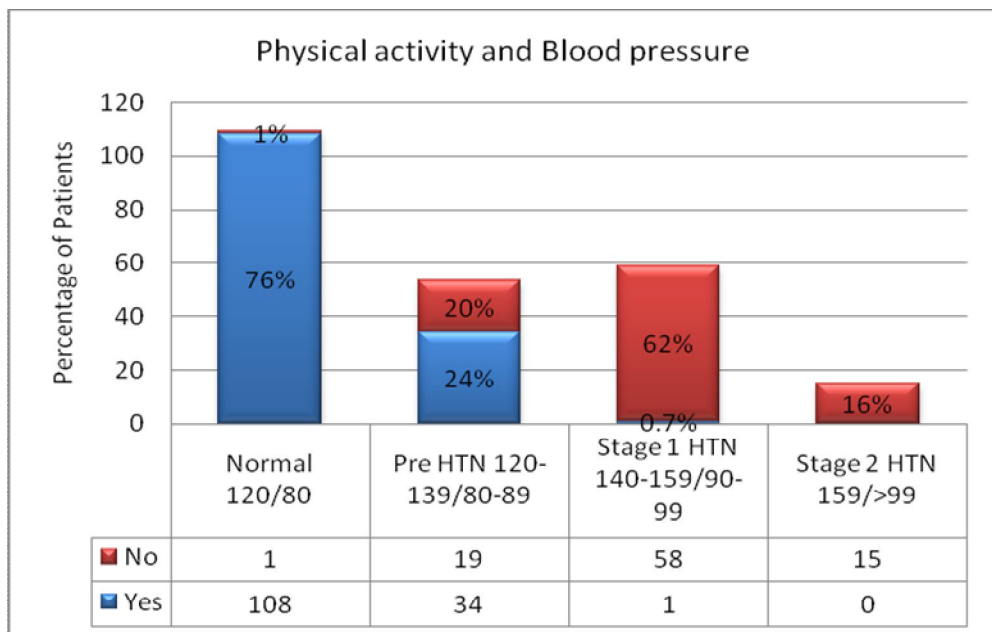
**Table 2. Level of education and physical activity.**

		Physical Activity			Total
		Yes	No	DNK*	
<b>Education</b>	Primary	30	20	-	50
	Matric	45	22	2	69
	Graduate	40	10	-	50
	Post Graduate	13	2	-	15
	Illiterate	15	39	2	56
<b>Total</b>		143	93	4	240

\* DNK = Do Not Know

As the education level increased the proportion of physical activity also increased significantly (P= 0.000) (Table 2). Education played a significant (P=0.000) role in the general awareness in the patient population regarding the meaning and awareness of normal blood pressure.

**Fig.1. Patients doing Physical activity in different stages of Hypertension.**



Patients who were already taking their antihypertensive medication regularly (61.5%), were more likely to do physical activity (44.49%) as well and they had better control of their BP over a period of time. Those who were irregular in taking their antihypertensive medication (27.3%) were also more likely to neglect their physical activity (16.1%) (Fig.1).

## **DISCUSSION**

Our study showed that as the patient's level of education rose, they were more aware of the normal blood pressure values and its significance and they were likely to be more regular both in medication intake and physical activity. Thus, the socioeconomic status presents an inverse relation with pressure levels and hypertension rates, showing that, the lower the income, occupation and education levels, the higher pressure levels tend to be.<sup>12</sup> Risk reduction is observed with as little as 30 minutes of moderate intensity activity per day.<sup>13</sup> It has been shown that any level of regular physical activity compared to sedentary life is associated with a significant reduction of the coronary risk in controlled hypertension.<sup>14</sup> The present study shows that the response to BP was significantly different in different age groups but was independent of gender ( $p < 0.05$ ). Socioeconomic trends in these behaviors are of crucial importance in determining whether socioeconomic mortality differences will widen or narrow in the future.<sup>15</sup>

In the present study, the education level of patients was significantly associated with their interest toward the physical activity. It has been shown that arterial pressure tends to be higher in patients with lower education levels and that having a partner, as expressed by their civil status, can facilitate the treatment process.<sup>5</sup> The people belonging to the age group 40-49

years i.e. the working class and the other major portion of the group consisting of people 50-59 years made the chunk of the sample population. It could also mean that the people in the working class had more access to the hospital for their routine checkup regarding their BP. The overall compliance regarding regular medication and regular physical activity depended on patient's level of education, affordability/accessibility, general prevalence of trends and beliefs in alternative medications like homeopathic medication and the role of doctor in providing information and motivation to the patients. The socioeconomic context is emphasized because the impact the deleterious effects of health risks exerts in low income countries is much higher.<sup>16</sup>

Social and cultural transitions during the process of economic development are thought to influence the pace at which hypertension and other risk factors for cardiovascular disease (CVD) emerge in developing countries.<sup>17</sup> BP was significantly different in hypertensive patients with and without regular exercise who were not taking medication. Socioeconomic status has been found to be related to hypertension in Jamaica, although relationships are non-linear.<sup>18</sup> In a country like ours where resources are scarce and opportunities for general public to engage in physical activities are rare, walking everyday presents an excellent solution for prevention and control of a lot of diseases especially hypertension and indirectly other co-morbid diseases.

## **CONCLUSION**

Raising the education level and promoting physical activity should be a part of a behavioral change strategy for the prevention and control of hypertension which will have multiple advantages.

From Department of Community Medicine - Islamabad Medical and Dental College (IMDC), Bara Kahu, Islamabad, Pakistan

Correspondence: Dr. Farwa Rizvi, Assistant Professor, Community Medicine.

Tel: 03215575333. E-mail: [farwa.riz@gmail.com](mailto:farwa.riz@gmail.com)

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