

Prevalence of Blood Pressure and Blood Sugar in a Sample of Older People: A Situation Analysis Across Different Socio-economic Neighborhoods in Lahore, Pakistan

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ABSTRACT

The blood pressure and blood sugar levels were measured from a sub-sample of older persons of both sexes across six urban localities of Lahore, Punjab, Pakistan. A survey was conducted on 921 respondents in September 2006 to accomplish our PhD research; 300 respondents aged 50 years and above were tested for blood pressure and blood sugar levels. Systolic and diastolic blood pressures increased with age, as expected, while diabetes was more prevalent in younger cohort of respondents. Exactly 17.6 % of the total number of respondents were suffering from hypertension stage-2 (SBP>160/DBP>100 mmHg) and 21.0% of them had >180 mg/dL sugar level. Gender based comparison indicated that women suffered more from hypertension and diabetes than their male counterparts. Both the hypertension and diabetes were more prevalent among the respondents from lower socio-economic strata. These findings are expected to underline the need for the due policy interventions for improving the life quality of our elderly.

INTRODUCTION

Hypertension is increasingly becoming a common health problem in developing countries due to increasing urbanization, stress and unhealthy lifestyles and a major risk factor for cardiovascular diseases.¹ Genetic and environmental factors are reported to play a key role in hypertension. Hypertension affects the quality of life with important ramifications for economic loss to the individual, family and nation as whole.² Hypertension is one of the chronic conditions that is being recognized as an emerging public health problem in Pakistan. Overall 21.0% urban population and 16.2% rural population in Pakistan was suffering from hypertension and one-third of Pakistanis over 45 years were hypertensive.⁴ Although hypertension is the major risk factor for cardiovascular diseases¹, yet diabetes is another chronic health condition that puts individuals at the increased risk of cardiovascular diseases, blindness,

and kidney diseases.^{5,6} The proportion of diabetic persons in Pakistan is growing. Pakistan ranked 7th in the world with 6.9 million diabetic people (20-79 age group) in the year 2007 and is expected to become 5th country with 11.5 million diabetic people (20-79 age group) in the year 2025.⁷ It has also been reported that 12.0% of the people of Pakistan above 25 years of age suffered from diabetes and 10.0% had impaired glucose tolerance.⁸

Not much has been done to determine the magnitude and socio-economic characteristics of high blood pressure and diabetes in older adults in Pakistan, particularly the prevalence of hypertension and diabetes in older adults aged 50 years and above for the effective intervention towards healthy ageing. The present paper is an attempt toward to contribute in that direction.

METHODS

Given the high prevalence of hypertension,

and diabetes in Pakistan, blood pressure and blood sugar were tested from a sample of older adults aged 50 years and above. The subjects (148 male and 152 females) were selected from the households of six urban localities in Lahore, Pakistan. An NGO, 'Care n Cure' provided the necessary assistance and the right medical professionals collected the needed data. The team of medical professionals comprised two doctors and six paramedics. They took the samples of blood of the subjects to measure blood pressure and blood sugar, more specifically random type II diabetes mellitus. The following medically diagnosed ranges were used to analyze the results of blood pressure:

- 1). SBP<120/DBP<80= Normal Blood Pressure
- 2). SBP120-139/DBP80-89= Pre-hypertension stage
- 3). SBP140-159/DBP90-99= Hypertension, Stage1
- 4). SBP>160/DBP>100= Hypertension, Stage2

Six medically diagnosed ranges were used to analyze the results of blood sugar. These ranges were:

- 1). <80 mg/dL
- 2). 80-100 mg/dL
- 3). 101-120 mg/dL
- 4). 121-140 mg/dL
- 5). 141-180 mg/dL
- 6). 180+ mg/dL

RESULTS

The data in Table 1 show that 17.6% of the total respondents were suffering from hypertension stage2 (SBP>160/DBP>100); 29.6% were suffering from hypertension stage1 (SBP140-159/DBP90-99) and 26.0% were in pre-hypertension stage (SBP120-139/DBP80-89). Only 26.6% of the total respondents had normal blood pressure. Of the 17.6% hypertensive, males constituted 7.0% and females 10.6%. Greater fraction of female respondents (21.1% from all six localities) was hypertensive compared to that of males (14.2% from all six localities).

The data in Table 1 show that greater share of respondents (12.3% of the total 17.6%) both males and females were hypertensive in middle socio-

economic strata (Rehman Pura and Mohallah Jalutiyan) and lower socio-economic strata (Qalandar Pura and Babu Sabu). However, a considerable proportion of older adults in posh areas (Babar Block and Scotch Corner Upper Mall) were also suffering from hypertension stage 2.

Interestingly, only 0.7% of male respondents from Mohallah Jalutiyan were afflicted with hypertension stage2. It could be due to strong neighborhood ties and social networking of males in Mohallah Jalutiyan (a community of old walled city of Lahore). It also indicates that traditional community life in Pakistan has strong bearing on only males, while it may not apply to women that significantly who, in the traditional community life, are not usually allowed to move in the public life. It clearly suggests that the availability of social support reduces stress and in turn less vulnerability to hypertension.

Most of the older adults from lower socio-economic strata reported that they migrated from nearby villages to Lahore for better economic opportunities and could not find the pockets of better employment, while the respondents from middle socio-economic strata reported stress in maintaining their lifestyle. One may argue that lifestyle incongruity, a term defined as an attempt to maintain a lifestyle inconsistent with one's economic standing⁹, could be one of the several reasons for high pressure among older adults of middle and lower socio-economic strata. However, the plausibility of the relationship between social class, life incongruity and high blood pressure is beyond the scope of present research.

Overall, the gender-based comparison clearly shows that women suffered from hypertension more frequently than their male counterparts. Widowhood, low income levels and low educational attainments might be attributed to hypertension among older females. However, the blood pressure results indicate the likelihood of additional morbidities and impairments among the older adults in the years to come.

Table 2 presents percent distribution of respondents by results of blood pressure by gender and age. The data show that greater proportions of respondents, both males and females aged 61+ years were afflicted with hypertension (stage2) compared

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Table 1: Percent distribution of respondents by test result of blood pressure by survey site

Gender	Blood pressure (stage)	Name of Localities					Total	
		Babar Block	Scotch corner upper mall	Rehman Pura	Mohallah Jalutiyani	Qalandar Pura		Babu Sabu
Male	Hypertension, Stage 2	3.4	2.0	2.0	0.7	3.4	2.7	14.2
	Hypertension Stage 1	1.4	2.7	5.4	4.1	9.5	5.4	28.4
	Prehypertension	6.1	3.4	4.7	2.7	4.7	7.4	29.1
	Normal BP	6.8	2.7	3.4	9.5	2.7	3.4	28.4
	Total	17.6	10.8	15.5	16.9	20.3	18.9	100.0
	Number	26	16	23	25	30	28	148
Female	Hypertension, Stage 2	2.0	3.3	3.9	3.3	5.9	2.6	21.1
	Hypertension Stage 1	1.3	3.9	7.9	7.2	5.9	4.6	30.9
	Prehypertension	3.3	1.3	4.6	3.9	5.3	4.6	23.0
	Normal BP	2.6	0.7	4.6	8.6	2.6	5.9	25.0
	Total	9.2	9.2	21.1	23.0	19.7	17.8	100.0
	Number	14	14	32	35	30	27	152

* Source: MCCPHA 2006: "Management of Chronic Conditions as Predictor of Healthy Ageing: An Analysis of Urban Population, Lahore, Pakistan" A survey conducted in 2006 to accomplish our Ph.D. research.

Table 2: Percent distribution of respondents by results of blood pressure test by gender and age

Gender	Age (years)	Blood Pressure (mmHg)				Total
		Hypertension stage 2	Hypertension stage 1	Pre-hypertension	Normal	
Male	≤ 60	4.7	12.8	18.2	14.9	50.7
	61-69	1.4	4.1	4.7	6.1	16.2
	≥70	8.1	11.5	6.1	7.4	33.1
	Total	14.2	28.4	29.1	28.4	100.0
	Number	21	42	43	42	148
Female	≤ 60	6.6	18.4	15.1	17.8	57.9
	61-69	4.6	2.0	2.6	2.0	11.2
	≥70	9.9	10.5	5.3	5.3	30.9
	Total	21.1	30.9	23.0	25.0	100.0
	Number	32	47	35	38	152

* Source: MCCPHA 2006: "Management of Chronic Conditions as Predictor of Healthy Ageing: An Analysis of Urban Population, Lahore, Pakistan" A survey conducted in 2006 to accomplish our Ph.D. research.

to those aged up to 60 years. This finding is concomitant with medical literature that hypertension (stage 2) is more prevalent in individuals of advanced ages. Various factors, such as diminishing physical strength, shrinkage of social world, widowhood and retirement seem to be linked with hypertension (stage 2) in older adults. The respondents having hypertension (stage 2) are likely to face the pertinent complications of hypertension, such as heart diseases, stroke, chronic kidney failure and angina.

Table 3 presents percent distribution of respondents by results of blood sugar tests by gender and locality. The data show that 21.0% respondents had >180 blood sugar levels. Of these 21.0% diabetics, 8.6% were males and 12.3% were females. Only 4% of the older adults had <80 sugar levels. Of these, 4% older adults having <80 sugar levels, 3.3 were males and only 0.6% were females. This gender-based comparison shows that more women than men suffered from diabetes, although the proportions remain low.

Table 3 Percent distribution of respondents by results of blood sugar test by gender and locality

Gender	Blood Sugar/Glucose (mg/dL) No Fasting	Name of Localities					Total	
		Babar Block	Scotch corner upper mall	Rehman Pura	Mohallah Jalutiyani	Qalandar Pura		Babu Sabu
Male	Over 180	1.4	2.0	2.7	2.7	2.7	6.1	17.6
	141-180	5.4	1.4	4.1	3.4	1.4	2.7	18.2
	121-140	3.4	0.7	0.7	0.7	00.0	2.0	7.4
	101-120	5.4	5.4	6.8	6.1	13.5	5.4	42.6
	80-100	0.7	1.4	1.4	1.4	0.7	2.0	7.4
	<80	1.4	00.0	00.0	2.7	2.0	0.7	6.8
	Total		17.6	10.8	15.5	16.9	20.3	18.9
Number		26	16	23	25	30	28	148
Females	Over 180	2.6	2.0	3.3	5.3	4.6	6.6	24.3
	141-180	1.3	00.0	2.6	2.0	2.6	1.3	9.9
	121-140	2.0	0.7	3.3	1.3	00.0	0.7	7.9
	101-120	2.0	5.9	8.6	11.8	12.5	8.6	49.3
	80-100	0.7	0.7	2.6	2.6	00.0	0.7	7.2
	<80	0.7	00.0	0.7	00.0	00.0	00.0	1.3
	Total		9.2	9.2	21.1	23.0	19.7	17.8
Number		14	14	32	35	30	27	152

* Source: MCCPHA 2006: "Management of Chronic Conditions as Predictor of Healthy Ageing: An Analysis of Urban Population, Lahore, Pakistan" A survey conducted in 2006 to accomplish our PhD research.

Table 4 Percent distribution of respondents by results of blood sugar tests by gender and age

Gender	Age (Years)	Blood Sugar/Glucose (mg/dL) No Fasting					Total	
		Over 180	141-180	121-140	101-120	80-100		<80
Male	≤ 60	10.8	10.8	4.7	12.2	6.1	6.1	50.7
	61-69	4.1	4.1	2.0	5.4	00.0	.7	16.2
	≥ 70	2.7	3.4	.7	25.0	1.4	00.0	33.1
	Total	17.6	18.2	7.4	42.6	7.4	6.8	100.0
Number	26	27	11	63	11	10	148	
Female	≤ 60	19.7	5.9	5.9	18.4	6.6	1.3	57.9
	61-69	2.6	1.3	.7	5.9	.7	00.0	11.2
	≥ 70	2.0	2.6	1.3	25.0	00.0	00.0	30.9
	Total	24.3	9.9	7.9	49.3	7.2	1.3	100.0
Number	37	15	12	75	11	2	152	

* Source: MCCPHA 2006: "Management of Chronic Conditions as Predictor of Healthy Ageing: An Analysis of Urban Population, Lahore, Pakistan" A survey conducted in 2006 to accomplish our PhD research.

This is plausible due to the fact that women generally stay home (while their male counterparts could go out) and due to their sedentary life, they have higher incidence of high blood sugar. On the other hand, it may also be argued that women generally do a lot of household work at home and there should be relatively low incidence of blood sugar. This argument may be valid on young males

and females. Among the elderly, this argument is not valid because elderly women had young daughters and daughters-in-law, who did most of the home chores. Furthermore, it may be argued that more men than their female counterparts managed their conditions and that is why men had low incidence of blood-sugar as compared to their female counterparts.

Table 4 presents percent distribution of respondents by the results of blood sugar tests by gender and age. The data show that 10.8% males and 19.7% females aged up to 60 years were afflicted with >180 mg/dL blood sugar. The corresponding figures for respondents aged 61+ were 6.8 and 4.6 respectively. These comparative data suggest women suffered more than their male counterparts. Interestingly, however, the younger cohort of respondents suffered from diabetes more than their older counterparts. It is surprising but the plausible explanation is that the people in their 50s were still active in their lives (not retired as yet) and they had to suffer from tension and pressure of work; and that might have caused higher levels of blood sugar among them.

Those afflicted with diabetes also demonstrated hypertension stage2, as the Pearson correlation result showed significant association (0.373, $P<0.01$) between >180 blood sugar and $SBP>160/DBP>100$ (Hypertension, Stage2). It indicates hypertension also results from diabetes. Diabetes mellitus contributes to a reduced filtration rate, which leads to increased glomerular blood flow and glomerular capillary pressure, in turn hypertension.¹⁰ Nevertheless, the results of blood pressure and blood sugar indicate that Pakistan will face the challenges of chronic conditions, particularly diabetes and hypertension, in the coming years and the pertinent policy quarters are cautioned to be prepared to deal with this emerging problem of Pakistani elderly.

DISCUSSION

Chronic diseases are fast becoming the world's leading causes of disability and death worldwide.¹¹ Hypertension and diabetes are considered responsible for additional morbidities. Hypertension and diabetes mellitus damage not only the cardiovascular system but also the kidneys.¹⁰ The high prevalence of hypertension (stage2) and diabetes seem to have negative ramification for the sample older adults, particularly the older adults from middle and lower socio-economic strata will face the challenges of additional morbidities. The blood pressure results showed that the systolic and diastolic blood pressure increased with age,

particularly in older adults from lower and middle socio-economic strata. It may be attributed with diminishing physical strength, shrinkage of social world, widowhood, retirement and lifestyle incongruity, a term defined as an attempt to maintain a lifestyle inconsistent with one's economic standing.⁹ However, diabetes was more prevalent in young older adults. The cumulative burden of disease increases for those who experience hypertension and diabetes earlier in life.¹² The hypertension stage2 and diabetes were more pronounced in female older adults than their male counterparts. Although male and female older adults shared many risk factors, the relative vulnerability toward hypertension (stage2) and diabetes varied by gender. Disparities in income levels, educational attainments, work-related stress, widowhood status, retirement and lifestyle incongruity were some of the factors of hypertension (stage2) and diabetes in the sampled population, particularly among the females.

CONCLUSION

The cumulative burden of disease may increase in older adults who were afflicted with hypertension (stage2) and diabetes in coming years. Drawing upon the results of blood pressure and blood sugar tests, it may safely be concluded that co-morbidities and disabilities will be more pronounced in female older adults in the years to come. This situation clearly warrants appropriate policy to address the issue of hypertension and diabetes in Pakistan. Since the blood pressure and blood sugar are subject to variations dependent upon diet, management and physician consultation, single measurements of blood pressure and blood sugar are sometimes not the true reflections of one's actual blood pressure and blood sugar. This is the major limitation of this research.

RECOMMENDATIONS

- Promotion of lifestyle changes which provide collateral health benefits, such as increased exercise, diet with low fat and cholesterol, stress management and giving up smoking.
- Routine testing of blood pressure and blood

sugar by hypertensive and diabetics is required to better manage the chronic conditions.

- Policy interventions are needed to help those who are afflicted with pre-hypertension stage (SBP120-139/DBP80-89) and impaired glucose tolerance (141-180 mg/dL), so that they may be saved from hypertension (stage2) and diabetes.
- Increasing and encouraging the involvement of older adults, particularly women, in social and cultural activities. Ensuring social protection to those living in destitution.

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