

Original Research Article

Prevalence of hypertension in patients attending dermatology outpatient department: a cross-sectional study of 1023 patients and discussion of the implications

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ABSTRACT

Background: Hypertension is a very big global burden of disease with high incidence of morbidity and mortality (cardiovascular, stroke, renal and retinopathy) making it a leading cause of death all over the world. It is multifactorial in etiology and is difficult to manage at later stages once systemic organ damage has set in. But early detection can prevent this disease and intervention, if needed, can prevent morbidity and mortality in large number of patients. This study was done to find out the prevalence of hypertension in our area, in North India.

Methods: A cross-sectional study was conducted in 1023 patients (including their attendants and staff) attending dermatology outpatient department of Maharaja Agrasen Medical College (MAMC), Agroha, Haryana, representing population from North India. Both urban and rural population was included with age 20 years and above.

Results: The prevalence of hypertension in age group above 20 years was 31.1% (37.7% males and 22.6% females). The prevalence in age group above 30 years was 46% (54.4% males and 35% females), which showed a rising trend with age.

Conclusion: High prevalence of hypertension was found in this study which increased with increasing age. We infer that more epidemiological studies should be done in India to detect hypertension at early stage which can help in preventing or early intervention in the treatment of hypertension and help in policy formulation at national level.

Keywords: Cardiovascular disease, Dermatology, Hypertension, Renal disease, Stroke

INTRODUCTION

Hypertension is one of the biggest global burdens of disease and leads on to cardiovascular diseases (myocardial infarction, stroke) and chronic renal disease. These complications are the leading cause of death worldwide.^{1,2}

Initially it does not have any symptoms in most patients, so it is aptly called a silent killer.³ Its prevalence, worldwide is about 26%.² Hypertension is in reality an iceberg phenomenon where unknown morbidity exceeds the known morbidity.⁴ The burden of hypertension is increasing not only in western world but also in developing countries. The developing world's

demographic transition has been the leading cause of increase in the burden of hypertension.^{2,5-7} World Health Organization (WHO) report (2002) predicted that CVD (Cardiovascular disease) will be the leading cause of morbidity and mortality in India by 2020, which seems ominously right today.⁸ Hypertension is responsible for 24% of coronary heart diseases and about 57% of stroke deaths in India.⁹

Prevalence of hypertension in developing countries has not been studied in the general population, epidemiologically, due to burgeoning population, lack of resources and lack of electronic health data records. Many authors have reported, in certain parts of urban India, the prevalence of hypertension to be 29-45% in men and 25-38% in women.¹⁰⁻¹³ In a meta-analysis of prevalence of hypertension in India, Gupta R (1997), reported that prevalence of hypertension has increased by 30 times in urban population over a 55 years period.¹⁴

Several risk factors (geographical, genetic, socio-economic, socio-cultural, dietary, lifestyle, habits & affluence) have been implicated in the etiology of hypertension. The urban population is more prone to develop CVD with its prevalence as high as 20.15%.¹⁵ But there are no epidemiological studies in developing countries like India. The India Global Burden of Disease (GBD) collaborators found that CVDs (Ischemic Heart Disease (IHD) and stroke) were the major causes of

mortality (28.1%) in India in 2016.¹⁶ Further, CVD's contribution to mortality increased by 34.3% from 1990 to 2016, because of increasing level of main risk factors like hypertension, pollution, diabetes mellitus and obesity.¹⁷ The prevalence of hypertension in India is estimated to be 30%¹⁸ and it is expected to double from 2000 (118 million) to 2025 (213.5 million).¹⁹ American Heart Association (AHA) was entrusted with the generous task of simplifying the earlier guidelines (of hypertension) and to give recommendation. Table 1 shows AHA guidelines (year 2017) for staging of hypertension.²⁰ Many health care providers were skeptical about new guidelines, as a large number of population will be categorized into hypertension according to new AHA guidelines. But sooner or later we have to accept this fact that managing hypertension is a serious business. Early detection, prevention and treatment by counseling regarding eating habits, lifestyle, stress management, abstinence from smoking, restriction of alcohol, stress management, obesity and physical activity will help those who will otherwise end up in stage-2 hypertension or hypertensive crises with cardiovascular morbidity and mortality, stroke, chronic renal damage and retinopathy. Moreover, health authority will make rigorous efforts in educating the masses and have more budgetary provisions along with necessary and regular physical checkups and follow up. So we followed AHA guidelines to grade hypertension in our patients in this study.

Table 1: American Heart Association (AHA) (2017) Hypertension Guidelines.²⁰

Grade of Hypertension	Systolic BP (mm Hg)		Diastolic BP (mm Hg)
Normal	<120	and	<80
Elevated BP	120-129	and	<80
Stage 1 hypertension	130-139	or	80-89
Stage 2 hypertension	140-180	or	90-120
Hypertensive crisis	≥180	or	≥120

The primary aim of this study was to identify the prevalence of hypertension in patients and their attendants, and staff members in dermatology outpatient department which in a way, reflect the general population of that area.

METHODS

This cross-sectional study was carried out in the dermatology outpatient department of Maharaja Agrasen Medical College (MAMC), Agroha, India between November 2018 and February 2019.

Inclusion criteria

All the patients who were aged 20 years and above, attending the dermatology outpatient department to seek

dermatological treatment, including their attendants and staff members were included in the study.

Exclusion criteria

The patients who were below 20 years of age, pregnant females and non-cooperative were excluded from the study.

Study population

A total of 1023 participants meeting the inclusion and exclusion criteria were included in our study.

The study was approved from the ethical committee of the institution. A structured data was collected from each participant with regards to the socio-demographic

variables like age, gender and residence (rural/urban). Patients were also categorized into groups of different dermatological diseases. Informed written consent was taken from each participant of the study.

The diagnosis and classification of hypertension was done according to American Heart Association Guidelines (AHA) 2017.²⁰ A subject was considered hypertensive if one had an average Systolic Blood Pressure (SBP) ≥ 130 mm Hg, Diastolic Blood Pressure (DBP) ≥ 80 mm Hg, or if he/she was already taking anti-hypertensive medication. The blood pressure was measured using auscultatory method with the help of standard calibrated sphygmomanometer, with the patient in sitting position, back supported and the arm was kept at the level of heart, after 5 minutes of rest, by which time the patient had emotionally stabilized. Three readings of blood pressure were taken and average of these was taken as the final reading. Systolic blood pressure was measured at the appearance of the Korotkov's sounds and diastolic blood pressure was taken at the point of disappearance of the sounds.

Statistical analysis

The statistical analysis was done through statistical package through social sciences (SPSS – 16.0 version). The statistical significance was calculated by one way analysis of variance (ANOVA). Significance level was used at 95% confidence level (p value < 0.05). Student's t -test was used to compare the continuous variables and Chi-square test was used to compare the categorical variables.

RESULTS

This study was carried out on 1023 patients including 576 males (56.3 %) and 447 females (43.7%) who were aged 20 years and above. The patients were categorized into different age groups ranging from 20-29 years to more than 60 years. The blood pressure records were categorized in these age groups. (Table 2)

Table 2: Distribution of study subjects according to age and gender (n=1023).

Age group (years)	Males No. (%)	Females No. (%)	Total No. (%)
20-29	236(55.8%)	187(44.2%)	423(41.3%)
30-39	106(46.1%)	124(53.9%)	230(22.5%)
40-49	107(61.5%)	67(38.5%)	174(17.0%)
50-59	53 (54.1%)	45 (45.9%)	98(9.6%)
>60	74(75.5%)	24(24.5%)	98(9.6%)
Total	576(56.3%)	447(43.7%)	1023(100%)

The prevalence of hypertension increased with the age (9.9% in age group of 20-29 years and 76.5% in age group of more than 60 years). A total of 217 males (37.7%) were hypertensive as compared to 101 females (22.6%). Among the hypertensive patients, 224 (32.4%) were residing in rural areas whereas 94 (28.4%) were from urban area. The overall prevalence of hypertension in this group was 31.1%. A total of 169 (16.5%) patients had elevated blood pressure. Among hypertensive subjects, Stage 1 hypertension was found in 82 (8%), Stage 2 in 200 (19.6%) and hypertensive crisis in 36 (3.5%). (Table 3)

Table 3: Socio-demographic variables effecting hypertension in patients aged >20 years.

Socio-demographic variable	Normal n (%)	Elevated n (%)	Stage 1 n (%)	Stage 2 n (%)	Hypertensive crisis n (%)	Hypertensives (Total) n (%)	Total (n=1023) n (%)
Age (years)							
20-29	310(73.3%)	71(16.8%)	22(5.2%)	19(4.5%)	1(0.2%)	42(9.9%)	423(41.3%)
30-39	128(55.7%)	45(19.6%)	20(8.7%)	35(15.2%)	2 (0.9%)	57(24.8%)	230(22.5%)
40-49	67 (38.5%)	32(18.4%)	12 (6.9%)	56(32.2%)	7 (4%)	75 (43.1%)	174 (17.0%)
50-59	18(18.4%)	11(11.2%)	17(17.3%)	42(42.9%)	10(10.2%)	69(70.4%)	98(9.6%)
>60	13 (13.3%)	10(10.2%)	11(11.2%)	48(49%)	16(16.3%)	75(76.5%)	98(9.6%)
Total	536(52.4%)	169(16.5%)	82(8%)	200(19.6%)	36 (3.5%)	318 (31.1%)	1023 (100%)
$\chi^2 = 326.512$; $df = 16$; $p < 0.001$; Highly significant							
Gender							
Male	269(46.7%)	90(15.6%)	54(9.4%)	135(23.4%)	28 (4.9%)	217 (37.7%)	576 (56.3%)
Female	267(59.7%)	79 (17.7%)	28 (6.3%)	65(14.5%)	8 (1.8%)	101 (22.6%)	447 (43.7%)
Total	536(52.4%)	169(16.5%)	82 (8%)	200(19.6%)	36 (3.5%)	318 (31.1%)	1023 (100%)
$\chi^2 = 28.769$; $df = 4$; $p < 0.001$; Highly significant							
Residence							
Rural	358(51.7%)	110(15.9%)	65 (9.4%)	137(19.8%)	22 (3.2%)	224 (32.4%)	692 (67.6%)
Urban	178(53.8%)	59 (17.8%)	17 (5.1%)	63 (19%)	14 (4.2%)	94 (28.4%)	331 (32.4%)
Total	536(52.4%)	169(16.5%)	82 (8%)	200(19.6%)	36(3.5%)	318(31.1%)	1023 (100%)
$\chi^2 = 6.514$; $df = 4$; $p = 0.164$; Not significant							

Table 4: Socio-demographic variables effecting hypertension in patients aged >30 years.

Socio-demographic variable	Normal n (%)	Elevated n (%)	Stage 1 n (%)	Stage 2 n (%)	Hypertensive crisis n (%)	Hypertensives (Total) n (%)	Total (n=600) n (%)
Age (years)							
30-39	128(55.7%)	45(19.6%)	20 (8.7%)	35(15.2%)	2 (0.9%)	57 (24.8%)	230(38.3%)
40-49	67 (38.5%)	3(18.4%)	12 (6.9%)	56(32.2%)	7 (4%)	75 (43.1%)	174 (29%)
50-59	18 (18.4%)	11(11.2%)	17(17.3%)	42(42.9%)	10 (10.2%)	69 (70.4%)	98 (16.3%)
>60	13 (13.3%)	10(10.2%)	11(11.2%)	48 (49%)	16 (16.3%)	75 (76.5%)	98 (16.3%)
Total	226(37.7%)	98(16.3%)	60 (10%)	181(30.2%)	35 (5.8%)	276 (46%)	600 (100%)
$\chi^2 = 124.616$; df = 12; $p < 0.001$; Highly significant							
Gender							
Male	107(31.5%)	48(14.1%)	36(10.6%)	122(35.9%)	27 (7.9%)	185 (54.4%)	340(56.7%)
Female	119(45.8%)	50(19.2%)	24 (9.2%)	59 (22.7%)	8 (3.1%)	91 (35%)	260(43.3%)
Total	226(37.7%)	98(16.3%)	60 (10%)	181(30.2%)	35 (5.8%)	276 (46%)	600(100%)
$\chi^2 = 25.100$; df = 4; $p < 0.001$; Highly significant							
Residence							
Rural	152(37.3%)	62(15.2%)	46(11.3%)	126 (31%)	21 (5.2%)	193 (47.4%)	407(67.8%)
Urban	74 (38.3%)	36(18.7%)	14 (7.3%)	55 (28.5%)	14 (7.3%)	83 (43%)	193(32.2%)
Total	226(37.7%)	98(16.3%)	60 (10%)	181(30.2%)	35 (5.8%)	276 (46%)	600 (100%)
$\chi^2 = 4.364$; df = 4; $p = 0.359$; Not significant							

Table 5: Distribution of study subjects (> 20 years of age) according to severity of blood pressure levels.

Grade of hypertension	SBP(mm Hg)	DBP(mm Hg)	Frequency	Percentage (%)
Normal	<120	<80	536	52.4%
Elevated	120-129	<80	169	16.5%
Stage 1	130-139	80-89	82	8.0%
Stage 2	140-180	90-120	200	19.6%
Hypertensive crisis	>180	>120	36	3.5%
Hypertensives on treatment	Any value	Any value	33	3.2%

Table 6: Distribution of study subjects (> 30 years of age) according to severity of blood pressure levels.

Grade of hypertension	SBP (mm Hg)	DBP (mm Hg)	Frequency	Percentage (%)
Normal	<120	<80	226	37.7
Elevated	120-129	<80	98	16.3
Stage 1	130-139	80-89	60	10.0
Stage 2	140-180	90-120	181	30.2
Hypertensive crisis	>180	>120	35	5.8
Hypertensives on treatment (Known cases)	Any value	Any value	33	5.5

The prevalence of hypertension was also calculated in patients who were aged 30 years and above, with regards to various socio-demographic variables. Among the hypertensive patients, 185 (54.4%) were males and 91 (35%) were females. 47.4% patients from rural area and 43.4% from urban area were hypertensives. Stage 1 hypertension was found in 10%, Stage 2 in 30.2% and hypertensive crisis in 5.8%. The overall prevalence of hypertension in this group was 46%. (Table 4)

The patients were also categorized into different dermatological diseases like dermatophyte infection

(29.6%), scabies (26.5%), urticaria (36.6%), psoriasis (39.4%), acne (9.8%), lichen planus (46.9%), eczemas (36.9%) and others (35.8%).

The study subjects were categorized according to severity of blood pressure levels. Among 1023 patients, 33 (5.5%) were already on anti-hypertensives. In patients aged > 20 years, elevated blood pressure was found in 16.5% of patients, Stage 1 hypertension in 8%, Stage 2 in 19.6% and hypertensive crisis in 3.5%. (Table 5) In patients aged >30 years, elevated blood pressure was found in 16.3% of patients, Stage 1 hypertension in 10%, Stage 2

hypertension in 30.2% and hypertensive crisis in 5.8% (Table 6).

Most of the hypertensive patients were newly diagnosed (28.54%) in patients > 20 years of age and only 3.2% were known cases (Table 7).

Table 7: Known and newly diagnosed cases of hypertension in patients aged >20 years.

Hypertension cases	Number of subjects	
	n	%
Known cases	33	3.2%
Newly diagnosed cases	292	28.54%

DISCUSSION

Hypertension has been prevalent in general population since time immemorial. But its significance has been studied extensively only in the last century. Its prevalence has been on the rise all over the world and more so in the last decade.² In India, prevalence of hypertension reported as 35.89% (34.8% in males and 33.1% in females).²¹ A prevalence of 35.9% in urban population of Punjab.⁴ Whereas in rural population of central India it was reported to be 19.4% (23.4% in males and 14.4% in females).²²

In South India, it was reported as 36.7% (36% in males and 37.2% in females, females reported to have slightly higher prevalence).²³ After an extensive search in database, no study was found regarding report of prevalence of hypertension in non-medicine outpatient department (OPD) like dermatology. Our study was done in dermatology OPD and prevalence of 31.1% was found in 1023 patients (of age more than 20 years), 37.7% in males and 22.6% in females. Present study was done in Haryana (North India) where obesity is not very common and lifestyle is comparatively active than adjoining states. But still prevalence was found to be 31.1%.

The prevalence of hypertension in patients above 30 years of age was 46% (54.4% males and 35% females) which shows a rising trend with increase of age. 3.5% patients above 20 years but 5.8% above age 30 years were in hypertension crisis which is alarming and surprising. This shows lack of awareness and lack of resources for health checkup. A total of 16.3% patients (aged 30 years and above) were categorized into elevated BP (SBP 120-129 and DBP <80) in our study, which is a huge finding and needs due importance in health data and policies. 5.5% patients (aged 30 years and above) were known hypertensives and taking anti-hypertensive medication.

The patients attending non-medicine OPD like dermatology largely represent general population. Though in strictest sense, door to door survey is the most accurate epidemiological study. Very few such studies have been done in North, central, East and South India.

Singh A et al, in Amritsar did such study.⁴ Most of the studies have been done in patients attending community health centres.

Epidemiological studies require huge resources and it is financially not possible in a country like India with a population of 1.25 billion people. Secondly, in countries like India, there has been tremendous change in socioeconomic, lifestyle and dietary factors in past few decades which along with urbanization and high stress level coping the modernization has led to significant increase in hypertension and cardiovascular morbidity and mortality. Rise in socioeconomic status with increased per capita income and modernization influence led to bad dietary habits like alcoholism, smoking, high fat and high carbohydrate diet, sedentary lifestyle and dependence for even smallest travel distances, on motorized vehicles. Another influence of modernization hit the people in the form of mental stress to stay in tune to the rising expenditure of modern day living, to higher ambitions for self and their children's achievements, social status and luxury goods. This vicious cycle became the very root cause of rise in various health problems like hypertension, cardiovascular diseases, obesity and diabetes which are major disease burdens for a developing country like India. A large proportion of families and nation's budget is consumed in fighting the morbidities and mortality of such disease like hypertension. Majority of medical departments of primary, secondary and tertiary care hospitals, which are understaffed and will remain so because of population explosion, are overburdened and struggling to care for two major diseases, i.e., infections and cardiovascular diseases. Hypertension and its related cardiovascular diseases are the main diseases other than infectious diseases worldwide and more so in a country like India and other South East Asian countries.

The premature deaths from Non Communicable Diseases (NCD) like CVD represent world's larger losses having huge policy ramifications.¹⁷ The ministry of health and family welfare has launched, in 2010, the National programme for prevention and control of Cardiovascular diseases, cancer and diabetes and another National programme for healthcare of elderly which are commendable. Most data collected by GBD collaborators are population based self-reports which fail to capture those with undiagnosed condition.^{24,25} Future improvements in survey data quality could change the prevalence and the true burden of NCDs which could be much higher than estimated.¹⁷

India, being a large country with a large population base, studying prevalence of hypertension in whole of the population is impracticable. We suggest, all patients attending OPD of every department of health facility, may it be primary health centre, Community health centre, district hospital or secondary or tertiary care hospital should be screened for blood pressure. So that we can counsel the patient to seek treatment from

concerned medical specialist. This will, in the long run, prevent cardiovascular morbidity and mortality in a large number of population. Initially, we get a denial response from the patients detected with hypertension, coming for treatment of unrelated diseases, ultimately, they will come to know of the consequences of the disease and seek help. Though hypertension is not a notifiable disease, nevertheless, vast data collected can help the state and the national health authorities to formulate health policies in a better way and target these patients more efficiently, thus preventing disease burden of premature cardiovascular mortality and morbidity.

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REFERENCES

1. Lim SS, Vos T, Flaxman AD, Danaei G, Shibuya K, Adair-Rohani H, et al. A comparative risk assessment of burden of disease and injury attributable to 67 risk factors and risk factor clusters in 21 regions, 1990-2010 : a systematic analysis for the Global Burden of Disease Study 2010. *Lancet* 2012;380(9859):2224-60.
2. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. *The Lancet*. 2005;365(9455):217-23.
3. Raja TK, Muthukumar T, Anisha MP. A cross sectional study on prevalence of hypertension and its associated risk factors among rural adults in Kanchipuram district, Tamil Nadu. *Int J Community Med Public Health*. 2018;5:249-53.
4. Singh A, Shenoy S, Sandhu JS. Prevalence of Hypertension and its Risk Factors among Urban Sikh population of Amritsar. *IJSR*. 2014;3(3):827-32.
5. O'Donnell MJ, Xavier D, Liu L, Zhang H, Chin SL, Rao-Melacini P, et al. Risk factors for ischaemic and intracerebral haemorrhagic stroke in 22 countries (the INTERSTROKE study): A case-control study. *Lancet*. 2010;376(9735):112-23.
6. Yusuf S, Hawken S, Ounpuu S, Dans T, Avezum A, Lanas F, et al. Effect of potentially modifiable risk factors associated with myocardial infarction in 52 countries: Case-control study. *Lancet*. 2004 Sep 11-17;364(9438):937-52.
7. Murray CJL, Lopez AD. Alternative projections of mortality and disability by cause 1990-2020: Global burden of disease study. *Lancet* 1997; 349(9064):1498-504.
8. Guilbert JJ. The World Health Report 2002: Reducing Risk, Promoting Healthy Life. *Educ Health (Abingdon)* 2003;16(2):230.
9. Gupta R. Trends in hypertension epidemiology in India. *J Human Hypertension*. 2004;18:73-8.
10. Gupta R, Gupta VP. Hypertension epidemiology in India: Lessons from Jaipur Heart Watch. *Curr Sci*. 2009;97:349-55.
11. Gupta R, Sharma AK, Gupta VP, Bhatnagar S, Rastogi S, Deedwania PC. Increased variance in blood pressure distribution and changing hypertension prevalence in an urban Indian population. *J Hum Hypertens*. 2003;17(8):535-40.
12. Reddy KS, Prabhakaran D, Chaturvedi V, Jeemon P, Thankappan KR, Ramakrishnan L, et al. Methods for establishing a surveillance system for cardiovascular diseases in Indian industrial populations. *Bull World Health Organ*. 2006;84:461-9.
13. Hypertension Study Group. Prevalence, awareness, treatment and control of hypertension among the elderly in Bangladesh and India: A multicentre study. *Bull World Health Organ* 2001;79:490-500.
14. Gupta R. Meta-analysis of prevalence of hypertension in India. *Indian Heart J* 1997;49(1):43-8.
15. Sidhu S, Kumari K, Kumari P. Socio-demographic Variables of Hypertension among Adult Punjabi Females. *J Hum Ecol*;2005;17(3):211-5.
16. Thomas N. India State-Level Disease Burden Initiative CVD Collaborators. The changing patterns of cardiovascular diseases and their risk factors in the states of India: the Global Burden of Disease Study 1990–2016. *Lancet Glob Health*. 2018;6(12):e1339-51.
17. Arokiasamy P. India's escalating burden of non-communicable diseases. *Lancet Glob Health*. 2018;6(12):e1262-3.
18. Anchala R, Kannuri NK, Pant H, Khan H, Franco OH, Di Angelantonio E, et al. Hypertension in India: a systematic review and meta-analysis of prevalence, awareness, and control of hypertension. *J Hypertens*. 2014;32(6):1170-7.
19. Kearney PM, Whelton M, Reynolds K, Muntner P, Whelton PK, He J. Global burden of hypertension: analysis of worldwide data. *Lancet*. 2005;365:217-23.
20. Whelton PK, Carey RM, Aronow WS, Casey DE Jr, Collins KJ, Dennison Himmelfarb C, et al. 2017 ACC /AHA /AAPA /ABC /ACPM /AGS /APhA /ASH /ASPC/NMA/PCNA guideline for the prevention, detection, evaluation and management of high blood pressure in adults: Executive Summary: A Report of the American College of Cardiology/American Heart Association Task Force on Clinical Practice Guidelines. *Hypertension*. 2018;71(6):1269-1324.
21. Bhardwaj R, Kandoria A, Marwah R, Vaidya P, Singh B, Dhiman P, et al. Prevalence, Awareness

- and Control of Hypertension in Rural Communities of Himachal Pradesh JAPI. 2010;58:423-5.
22. Kokiwar PR, Gupta SS, Durge PM. Prevalence of Hypertension in a Rural Community of Central India. J A P I. 2012;60(6):26-9.
23. Thankappan KR, Sivasankaran S, Khader SA. Prevalence, awareness, treatment and control of in Hypertension, Kumarakom, Kerala. Indian Heart Journal 2006; 58(1):28-33.
24. Arokiasamy P, Uttamacharya, Kowal P, et al. Chronic noncommunicable diseases in 6 low- and middle-income countries: findings from wave 1 of the World Health Organization's study on global ageing and adult health (SAGE). Am J Epidemiol. 2017; 185(6): 414-28.
25. Arokiasamy P, Bloom DE, Lee J, O'Brien J, Parasuraman S. Biological markers and the health of older Indians: results from the 2010 LASI pilot. Econ Polit Wkly. 2016;51(1):47-58.

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