Original Research Article

DOI: http://dx.doi.org/10.18203/2394-6040.ijcmph20194004

Effect of stress on hypertension among professional groups at Bareilly: a cross sectional study

Shailesh Gupta¹*, Shruti Gupta²

¹Department of Community Medicine, BPS GMC (W), Sonepat, Haryana, India ²Department of Obstetrics and Gynecology, Sir Gangaram Hospital, Delhi, India

Received: 22 June 2019 Accepted: 30 July 2019

*Correspondence: Dr. Shailesh Gupta,

E-mail: drshailesh2329@gmail.com

Copyright: © the author(s), publisher and licensee Medip Academy. This is an open-access article distributed under the terms of the Creative Commons Attribution Non-Commercial License, which permits unrestricted non-commercial use, distribution, and reproduction in any medium, provided the original work is properly cited.

ABSTRACT

Background: The objective of the present study was to study the effect of stress on hypertension in various professional groups.

Methods: A cross sectional study was done from 1st August 2015 to 30th August 2017 in district Bareilly. A predesigned and pretested questionnaire was used comprising of demographic data and stress. Three types of professionals were included in this study: doctors, managerial staff and school teachers from the teaching institutions. **Results:** This study showed association of hypertension with stress level and found that 24.62% doctors, 72.31% school teachers and 27.69% managerial staff were hypertensive with mild stress level. Among all study subjects 41.54% were hypertensive with mild stress level. 15.38% doctors, 10.77% school teachers and 46.92% managerial staff were hypertensive with moderate stress level. Among all study subjects 24.36% were hypertensive with moderate stress level. 46.15% doctors, 0.76% school teachers and 8.46% managerial staff were hypertensive with severe stress level. Among all study subjects 18.46% were hypertensive with severe stress level. Chi-square test for association was applied and p-value was found significant for doctors, managerial staff and insignificant in school teachers. Among all study subjects p value 0.016 was found significant.

Conclusions: The present study showed highly significant association for hypertension with stress level among doctors and managerial staff with p value (0.005) and (0.001).

Keywords: Hypertension, Stress, Doctors, Teachers, Managerial staff

INTRODUCTION

Hypertension also known as high or raised blood pressure is a global public health issue. It is a major risk factor for stroke and coronary heart diseases and is a major contributor to the onset and progression of chronic heart failure and chronic kidney failure. Blood pressure is the force of blood pushing against the walls of arteries as flows through them. Blood pressure is highest when the heart beats to push out blood into the arteries (systolic blood pressure) and when the heart relaxes to fill with blood again the pressure is at its lowest point (diastolic

blood pressure). The global prevalence of raised blood pressure defined as systolic and/or diastolic blood pressure ≥140/90 mmHg in adults aged 18 years and over was around 22% in 2014. In India, hypertension is the leading non communicable disease risk and estimated to be attributable for nearly 10 per cent of all deaths. Adult hypertension prevalence has risen dramatically over the past three decades from 5 per cent to between 20-40 per cent in urban areas and 12-17 per cent in rural areas. The number of hypertensive individuals is anticipated to nearly double from 118 million in 2000 to 213 million by 2025.² High blood pressure is increasing in India due to rapid urbanization and globalization leading to adoption of unhealthy lifestyles. Many people are unaware that they have high blood pressure and remain undiagnosed. Even the majority of those who are diagnosed do not get treated to control the blood pressure. It became evident in early 1970s that only about half of the hypertensive subjects in the general population of most developed countries were aware of the condition only about half of those aware of the problem were being treated and only about half of those treated were considered adequately treated. Stress has become a public health menace of the day. It cannot be eliminated from life and it's absolutely essential that we learn to manage it. Stress management is of special relevance to doctors who encounter extreme challenges in their professional and personal life. It will pave the way for working out appropriate coping strategies and interventions.³ Decreased physical activities coupled with increased mental tension are important contributors. Several studies have shown that lifestyle factors have their significant role in causing hypertension in professionals. Keeping this in view the present study was done to study the impact of stress on hypertension among three professional groups, doctors, school teachers and managerial staff of Bareilly, Uttar Pradesh.

METHODS

Study design

It is a cross sectional study done in three professional groups; doctors, school teachers and managerial staffs.

Study period

The total study period was two year from 1st August 2015 to 30th August 2017.

Study tool

A predesigned and pretested questionnaire comprising of demographic data and mental stress was prepared in English language after reviewing the available literature; however questions were asked in local language at the time of interview after obtaining verbal consent.

Study area

The present cross sectional study was done in district Bareilly.

Inclusion criteria

All individual willing to participate from each profession, have been included in the study.

Exclusion criteria

Subjects with co-morbid conditions were not included in the study and subjects not willing to participate were also excluded.

Sampling technique

The study subjects were selected randomly from three professional groups.

Sample size estimation

According to a study conducted by Ramachandran et al on young physicians in India, the using prevalence of hypertension 35.6%. Absolute errors was taken as 5% and the required sample size was 352. The sample size is rounded to 390. The study includes 3 professional groups i.e., doctors, school teachers and managerial staff. Therefore the total sample size is divided into 3 parts and 130 sampling units are assigned to each professional group.

Table 1: Classification of Blood pressure (BP).

BP classification	SBP (mmHg)	DBP (mmHg)
Normal	<120	and <80
Prehypertension	120-139	80-89
Stage 1 hypertension	140-159	90-99
Stage 2 hypertension	≥160	≥100

Table 2: Mental stress was assessed by using Holmes and Rahe stress inventory scale.⁶

Holmes and Rahe stress inventory scale for assessing mental stress	Mean value
Death of spouse	100
Divorce	73
Marital separation	65
Detention in jail or other institution	63
Death of a close family member	63
Major persona injury or illness	53
Marriage	50
Being fired at work	47
Marital reconciliation with mate	45
Retirement from work	45
Major change in the health or behavior	44

Continued.

Holmes and Rahe stress inventory scale for assessing mental stress	Mean value
Pregnancy	40
Sexual difficulties	39
Gaining a new family member (i.e., birth, adoption, older adult moving etc.)	39
Major business readjustment	39
Major change in financial state(i.e., a lot worse or better off than usual	38
Death of a close friend	37
Changing to a different line of work	36
Major change in the no of arguments with spouse	35
Taking on a mortgage (for home, business)	31
Foreclosure on a mortgage or loan	30
Major change in responsibilities at work (promotion, demotion)	29
Son or daughter leaving home(marriage, attending college, joined military)	29
In law troubles	29
Outstanding personal achievement	28
Spouse beginning or ceasing work outside the home	26
Beginning or ceasing formal schooling	26
Major change in living condition (new home, remodeling, deterioration of neighborhood or	25
home)	23
Revision of personal habits	24
Trouble with the boss	23
Major changes in work hours or conditions	20
Changes in residence	20
Changing to a new school	20
Major change in usual type and/or amount of recreation	19
Major change in church activity (i.e. a lot or less than usual)	19
Major change in social activities(club, movies, visiting)	18
Taking on a loan (car, freezer, etc.)	17
Major change in sleeping habits(a lot more or a less than usual)	16
Major change in number of family get together	15
Major change in eating habits(a lot more or a lot less than usual)	15
Vacation	13
Major holidays	12
Minor violations of the law (traffic, tickets, jaywalking, disturbing the peace, etc)	11
Total	1372

Blood pressure was measured using standard protocol. The auscultatory method of BP measurement with a calibrated and validated manual mercury sphygmomanometer was used. An adult sized cuff bladder was used to ensure accuracy. Subjects were asked to be seated quietly for at least 5 minutes in a chair with feet on the floor, and arm supported at heart level. The systolic and diastolic pressures were measured three times over a period of at least 3 minutes and the lowest reading was recorded. Hypertension was diagnosed using JNC 7 criteria.⁵

Data management and statistical analysis

Data so obtained were compiled and presented in tabular form and statistical analysis was done with the help of appropriate statistical test and software. The data collected were entered in the Excel spread sheet and statistical analysis was done using IBM SPSS v20.0.0.

RESULTS

Table 3 shows the distribution of socio-demographic variables in which majority of subjects were belonging to age group of 30-40 years (47.43%) followed by age groups 20-30 years (22.30%), 40-50 years (18.20%) and >50 years (12.07%.). Distribution of nuclear and joint family is 68.97% and 31.03% respectively in the study. Males contributed 78.46%, while 21.53% were females in the study population. Majority of the study subjects 93.08% belonged to Hindu religion followed by Muslim, Sikh and other population those were 4.11%, 2.30% and 0.51% respectively. Majority of subjects in the study were from general caste (58.20%) followed by OBC (38.97%), SC (2.57%) and ST (0.26%) Education profile showed that majority of the study subjects was educated up to postgraduate level 72.82% while remaining subjects were graduate 27.18%. Majority of the study population 64.61% belonged to socioeconomic upper class, followed by 23.34 % in middle class, 11.29% in upper middle, 0.76% in lower middle class.

Table 4 shows stress level among doctors, school teachers and managerial staff (stress level was assessed by a scoring system suggested by Holmes and Rahe stress inventory scale). Majority of school teachers (84.62%) were found mildly stressed followed by managerial staff (30.77%) and doctors (24.62%).

Majority of managerial staff (53.08%) was found moderately stressed followed by doctors (20.77%) and school teachers (13.08%). Majority of doctors (54.61%) were found severely stressed followed by managerial staff (16.15%) school teachers (2.30%). On applying χ^2 test association between stress level and professional groups was found to be highly significant with p value (<0.001).

Table 3: Distribution of study subjects according to their sociodemographic characteristics (n=390).

Socio-demographic varia	bles	Frequency (N)	Percentage (%)	
Age distribution	20-30	87	22.30	
(in years)	30-40	185	47.43	
-	40-50	71	18.20	
	>50	47	12.07	
Status of family	Nuclear	269	68.97	
Status of family	Joint	121	31.03	
Sex	Male	306	78.46	
Sex	Female	84	21.53	
	Hindu	363	93.08	
Daliaian	Muslim	16	4.11	
Religion	Sikh	9	2.30	
	Others	2	0.51	
	General	227	58.20	
Caste	OBC	152	38.97	
Caste	SC	10	2.57	
	ST	1	0.26	
Educational status	Graduate	106	27.18	
Educational status	Postgraduate	284	72.82	
	Upper class	252	64.61	
	Upper middle class	44	11.29	
Socio-economic class	Middle class	91	23.34	
	Lower middle class	3	0.76	
	Lower class	0	0	

Table 4: Stress level among doctors, school teachers and managerial staff (n=390).

Stress level	Doctors School teacher		Managerial staff	Total	
(score)	N (%)	N (%)	N (%)	N (%)	
No significant problem (0-149)	0 (0)	0 (0)	0 (0)	0 (0)	
Mild (150-199)	32 (24.62)	110 (84.62)	40 (30.77)	182 (46.67)	
Moderate (200-299)	27 (20.77)	17 (13.08)	69 (53.08)	113 (28.98)	
Severe (>300)	71 (54.61)	3 (2.30)	21 (16.15)	95 (24.35)	
Total	130	130	130	390	
χ2	179.528	•			
df	4				
P value	< 0.001				

Table 5 shows association among the doctors, school teachers and managerial staff according to their stress level and found that mild stress level among professional groups and found 24.62% doctors, 72.31% school teachers and 27.69% managerial staff were hypertensive with mild stress level. Among all study subjects 41.54%

were hypertensive with mild stress level. 15.38% doctors, 10.77% school teachers and 46.92% managerial staff were hypertensive with moderate stress level. Among all study subjects 24.36% were hypertensive with moderate stress level. 46.15% doctors, 0.76% school teachers and 8.46% managerial staff were hypertensive with severe

stress level. Among all study subjects 18.46% were hypertensive with severe stress level. A x^2 test for association was applied and p value was found significant

for doctors, managerial staff and insignificant in school teachers. Among all study subjects p value 0.016 was found significant.

Table 5: Association of hypertension with stress level among various professional groups (n=390).

G4	Doctors		School teacher		Managerial staff		Total	
Stress level	HTN	Non HTN	HTN	Non HTN	HTN	Non HTN	HTN	Non HTN
	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)	N (%)
Mala	32	0	94	16	36	4	162	20
Mild	(24.62)	(0)	(72.31)	(12.31)	(27.69)	(3.08)	(41.54)	(5.13)
Moderate	20	7	14	3	61	8	95	18
	(15.38)	(5.39)	(10.77)	(2.31)	(46.92)	(6.16)	(24.36)	(4.62)
Severe	60	11	1	2	11	10	72	23
	(46.15)	(8.46)	(0.76)	(1.54)	(8.46)	(7.69)	(18.46)	(5.89)
TD - 4 - 1	112	18	109	21	108	22	329	61
Total	(86.15)	(13.85)	(83.85)	(16.15)	(83.08)	(16.92)	(84.36)	(15.64)
χ2	8.607		5.890		16.831		8.280	
df	2		2		2		2	
P value	0.014		.08		< 0.001		0.016	

DISCUSSION

In the present study majority of the study population (64.61%) belonged to socioeconomic upper class, followed by 23.34 % in middle class, 11.29% in upper middle class, and 0.76% in lower middle class which is comparable to Mendez et al (2003) reported in a cross sectional study to examine the association between socioeconomic status and hypertension (SBP ≥140/ DBP ≥90 mm Hg) in 2082 adults in Jamaica. The income distribution of BP and hypertension were non-linear and moreover, the hypertension was found to be the highest in wealthiest women. In men with same high school education, income was positively associated with BP whereas Ribet et al reported a study analyzed the relationship between major cardiovascular risk factors in French men (aged 40-50 years) and their spouse's occupational category. 8 Spouse's occupational category was independently associated with men's hypertension.

The present study showed stress level among doctors, school teachers and managerial staff and found that in mild category, majority (84.62) were school teachers followed by managerial staff (30.77%) and (24.62%) in doctors. In moderate category maximum stress level (53.08%) was found in managerial staff followed by in doctors (20.77%) and 13.08% in school teachers. In severe category majority (54.61%) were doctors followed by 16.15% in managerial staff and 2.30% in school teachers. By applying Chi-square test for association p value <0.001 was found highly significant which is comparable to study of Cesana et al studied the association between job strain and blood pressure in four population samples of age 25 to 54 years from northern Italy.9 Among men there was a 3 mmHg increase of systolic blood pressure (p<0.001) moving from low to high strain job categories. Nakanishi et al showed the association of long working hours with the risk of hypertension in men (35-54 years) and reported the relative risk of Hypertension above the borderline levels to be 0.63 in subjects working <8.0 hours/day.¹⁰

CONCLUSION

The present study showed highly significant association for hypertension with stress level among doctors and managerial staff with p value (0.005) and (0.001). The odds of developing high blood pressure and its adverse consequences in professional groups can be minimized by management of stress by recreational activities, meditation and yoga.

Individuals who already have hypertension can actively participate in managing their condition by, adopting the healthy behaviors such as monitoring blood pressure at regular intervals at home if feasible, checking blood sugar and blood cholesterol and urine albumin twice a year, following medical advice and prescribed medications for lowering blood pressure.

Funding: No funding sources Conflict of interest: None declared

Ethical approval: The study was approved by the

Institutional Ethics Committee

REFERENCES

- Hypertension Gale Encyclopedia of Medicine, 2008. Available at: http://medicaldictionary.thefreediction ary.Com/hypertension. Accessed on 1 August 2017.
- 2. Non communicable disease situation and response: WHO South East Asia region New Delhi. 2011.

- 3. Dhar N, Datta U, Nandan D. Stress among doctors a review Health and Population: Perspect Issues. 2008;31(4):256-66.
- 4. Ramachandran A, Chamukuttan A, Yamuna SA, Murugesan N. High prevalence of cardiometabolic risk factors among young physicians in India. J Assoc Physician India. 2008;56;17-20.
- Khan NA, Hemmelgarn B, Padwal R, Larochelle P, Mahon JL, Lewanczuk RZ. The 2007 Canadian Hypertension Education Program recommendations for the management of hypertension: part 2-therapy. Can J Cardiol. 2007;23:539-50.
- 6. Holmes T, Rahe R. Holmes-Rahe Social Readjustment Rating Scale. J Psychoso Res. 1967;11(2):213-8.
- 7. Mendez, Forrester T. Income, education, and blood pressure in adults in Jamaica, a middle-income developing country. Int J Epidemiol. 2003;32(3):400-8.

- 8. Ribet C, Lang T, Zins M, Bingham A, Ferrières J, Arveiler D, et al. Do cardiovascular risk factors in men depend on their spouses occupational category. Eur J Epidemiol. 2001;17:347-56.
- Cesena G, Ferrario M, Sega R. Job strain and ambulatory blood pressure levels in a population based employed sample of men from northern Italy. Scand J Work Environ Health. 1996;22(4):294-305.
- Nakanishi N, Yoshida H, Nagano K, Kawashimo H, Nakamura K, Tatara K. Long working hours and risk for hypertension in Japanese male white collar workers. J Epidemiol Community Health. 2001;55(5):316-22.

Cite this article as: Gupta S, Gupta S. Effect of stress on hypertension among professional groups at Bareilly: a cross sectional study. Int J Community Med Public Health 2019:6:3973-8.