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Original Research Article

Prevalence and Associated Risk Factors of Hypertension Among Police Personnel: A Cross-Sectional Study

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Abstract

Introduction: Hypertension is a major global health problem and a leading risk factor for cardiovascular morbidity and mortality. Police personnel are exposed to occupational stress, long duty hours, and irregular lifestyle, increasing their risk of hypertension. This study was conducted to assess prevalence and associated risk factors among police personnel in District Jhalawar, Rajasthan.

Objectives: To estimate the prevalence of hypertension among police personnel, to identify the associated socio-demographic and occupational risk factors, and to provide health education for the prevention of hypertension.

Methods: A cross-sectional study was conducted among 165 police personnel in Jhalawar. Data were collected using a structured questionnaire along with anthropometric measurements and blood pressure recording. Analysis was done using SPSS v23.0, and a chi-square test was applied ($p<0.05$ significant).

Results: Prevalence of hypertension was 17.58%. Significant associations were found with age, living away from family, BMI, waist-hip ratio, higher rank, longer duty hours, tobacco use, alcohol consumption, and comorbidities.

Conclusion: Hypertension is common among police personnel and is influenced by both occupational and lifestyle factors. Regular screening and preventive interventions are recommended.

Keywords: Hypertension, Police personnel, Risk factors, Occupational stress, Cross-sectional study.

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Introduction

Hypertension is a major non-communicable disease and an important public health problem worldwide. According to the World Health Organization (WHO), approximately 1.28 billion adults aged 30–79 years worldwide are living with hypertension, with nearly two-thirds residing in low- and middle-income countries.[1] It is also estimated that around 46% of individuals with hypertension are unaware of their condition, making it a major contributor to premature mortality worldwide.[1] In India, the prevalence of hypertension has been steadily increasing. According to the National Family Health Survey-5 (NFHS-5), Phase II (2019–21), the prevalence of hypertension is approximately 21% among females and 24% among males.[2] Hypertension is a major risk factor for cardiovascular diseases and is responsible for significant morbidity and mortality globally.[3] The risk of developing hypertension is influenced by various occupational and lifestyle factors. Shift work, long working hours, and occupational stress have been strongly associated with increased cardiovascular risk, including hypertension.[4,5] Police personnel represent a high-risk occupational group due to prolonged working hours, exposure to stressful and unpredictable situations, dealing with criminals, VIP duties, inadequate rest, and limited family interaction, all of which contribute to increased psychological stress and may adversely affect health.[4,5]. However limited data are available regarding the prevalence of hypertension and associated risk factors among police personnel in District Jhalawar, Rajasthan.

Objectives: To estimate the prevalence of hypertension among police personnel, to identify the associated socio-demographic and occupational

risk factors, and to provide health education for the prevention of hypertension.

Materials and Methods

Study Design and Study Area: A cross-sectional study was conducted among police personnel posted at various police stations in Jhalawar city, Rajasthan.

Study Period: The study was carried out from October to November 2022.

Study Population: All police personnel of different designations posted in Jhalawar city during the study period were considered eligible for participation.

Sampling Technique and Sample Size: Complete enumeration sampling technique was used. A total of 179 police personnel were posted in Jhalawar city at the time of study. Among them, 6 personnel were on leave and 8 did not provide consent to participate. Therefore, the final sample size comprised 165 police personnel.

Inclusion and Exclusion Criteria: Police personnel who had been serving for at least one year and were willing to participate in the study were included. Non-consenting police personnel, as well as pregnant and lactating women, were excluded from the study.

Procedure of Data Collection: After obtaining informed written consent, participants were interviewed individually using a pre-designed and pre-structured questionnaire.

Information regarding socio-demographic characteristics such as age, gender, marital status, religion, residence, and family type was collected. Occupational details including service rank, years of service, duty hours, and patrolling duties were recorded. Information regarding dietary habits, average salt and oil intake, tobacco and alcohol consumption, physical activity, and existing comorbidities was also obtained. Anthropometric measurements including height, weight, body mass index (BMI), and waist-hip ratio were measured using standard techniques. General physical examination including blood pressure and vital parameters was performed for all participants.

Statistical Analysis: Data were entered and analyzed using SPSS version 23.0 (trial version). Descriptive statistics were expressed as frequency and percentage. Chi-square test was applied to determine association between hypertension and various risk factors. A p-value of less than 0.05 was considered statistically significant.

Ethical Considerations: The study was conducted after obtaining approval from the Institutional Ethics Committee. Permission was also obtained from the Superintendent of Police, Jhalawar. Written informed consent was obtained from all participants after explaining the objectives, benefits, and possible limitations of the study.

Result

Out of the total 165 police personnel included in the study, 29 participants were found to be hypertensive, giving a prevalence of 17.58%, while 136 (82.42%) participants were non-hypertensive. This indicates that nearly one out of every six police personnel was suffering from hypertension.

Table 1: Association of Hypertension with Socio-demographic and Anthropometric variables

Variables	Hypertension		Total	p-value
	Yes (n=29)	No (n=136)		
Age				
18-30	2(4.0)	48(96.0)	50	0.001*
31-40	8(12.5)	56(87.5)	64	
41-50	8(25.8)	23(74.2)	31	
51-60	11(55.0)	9(45.0)	20	
Gender				
Male	29(18)	132(82)	161	0.350
Female	0(0)	4(100)	4	
Residence				
Rural	4(9.1)	40(90.9)	44	0.084
Urban	25(20.7)	96(79.3)	121	
Marital Status				
Unmarried	2(28.57)	5(71.43)	7	0.78
Married	27(17.09)	131(82.91)	158	
Living With Family				
Yes	11(11.34)	86(88.66)	97	0.011*
No	18(26.47)	50(73.53)	68	
Religion				
Hindu	23(14.6)	134(85.4)	157	0.001*

Muslim	6(75)	2(25)	8	
BMI				
Underweight<18.5	2(100)	0(0)	2	0.004*
Normal 18.5 To 24.9	8(12.3)	57(87.7)	65	
Overweight >25	19(19.4)	79(80.6)	98	
Waist Hip Ratio				
High	12(30.0)	28(70.0)	40	0.017
Normal	17(13.6)	108(86.4)	125	

Out of 165 police personals, 161 (97.58%) were male and 04 (2.42%) were females. Mean age of participants were 37.38±9.8 years. Average year of service was 14.96±7.6years. Hypertension was significantly associated with increasing age (p=0.001), living away from family (p=0.011), religion (p=0.001), BMI (p=0.004) and people with high waist hip ratio (p=0.017).

Table 2: Association of hypertension with Service profile variables

Variables	**Hypertension**		**Total**	**p-value**
	Yes (n=29)	**No (n=136)**		
Present service rank				
Constable	9(8.3)	99(91.7)	108	0.001*
Head constable	14(32.6)	29(67.4)	43	
ASI-SI	6(42.9)	8(57.1)	14	
Years of service				
<5	4(13.8)	25(86.2)	29	0.973
5-10	9(18.8)	39(81.2)	48	
11-15	5(18.5)	22 (81.5)	27	
16-20	3(21.4)	11(78.6)	14	
>20	8(17)	39(83)	47	
Duty hours				
≤ 12	05 (8.93)	51 (91.07)	56	0.036
>12	24 (22.02)	85 (77.98)	109	
Any kind of Patrolling duty				
Yes	27(20)	108(80)	135	0.083
No	2(6.7)	28(93.3)	30	

With higher rank (p=0.001) and increase in duty hours (p=0.036), chances of hypertension was increasing while it was unaffected with years of service (p=0.97) and any kind of patrolling duty (p=0.083).

Table 3: Association of Hypertension with eating habit and other contributory factors among police personnel

Variables	**HTN**		**Total**	**p-value**
	Yes	**No**		
Diet				
Veg.	9(13.4)	58(86.6)	67	0.248
Mixed	20(20.4)	78(79.6)	98	
Excess oil				
Yes	4(33.3)	8(66.7)	12	0.136
No	25(16.3)	128(83.7)	153	
Excess salt				
Yes	10(25.6)	29(74.4)	39	0.130
No	19(15.1)	107(84.9)	126	
Tobacco Use				
Yes	19(30.6)	43(69.4)	62	0.001*
No	10(9.7)	93(90.3)	103	
Alcohol				
Yes	21(24.4)	65(75.6)	86	0.016*
No	8(10.1)	71(89.9)	79	
Physical activity				
No	23(22.8)	78(77.2)	101	0.164
<30	4(9.1)	40(90.9)	44	

30-60	2(11.8)	15(88.2)	17	
>60	0(0)	3(100)	3	
Family history of HTN				
Present	12(25.5)	35(74.5)	47	0.090
Absent	17(14.4)	101(85.6)	118	
Co-morbidity				
Yes	17(80.95)	4 (19.05)	21	0.001*
No	12 (8.33)	132(91.67)	144	

Addiction in the form of tobacco (p=0.001) and alcohol (p=0.016) consumption was associated with hypertension. Among police personals, 21 had co-morbidity such as diabetes, asthma etc along with hypertension. No association was found with dietary habit, physical activity and family history of hypertension

Discussion

Hypertension is a major public health concern worldwide, particularly among high-risk occupational groups such as police personnel. Police officers are often exposed to stressful work conditions, long duty hours, irregular shifts, and sedentary periods, which contribute to increased cardiovascular risk. Present study was carried out to determine the prevalence of hypertension and its associated risk factors among police personnel in Jhalawar, Rajasthan.

In the present study, the overall prevalence of hypertension was 17.58%. This finding is lower than reported in some previous Indian studies. Chauhan et al [6] observed a prevalence of 67.9% among police personnel in Gwalior, Madhya Pradesh, while Parkash et al [7] reported 36.4% prevalence in Haryana. Similarly, Sen et al [8] reported 32.5% among Kolkata-based policemen. Variations in prevalence may be due to differences in sample size, study area, age distribution, rank, lifestyle habits, and method of blood pressure measurement.

In the present study, age was significantly associated with hypertension (p=0.001), with prevalence increasing in older age groups. This is consistent with findings by Parkash et al [7] and Sen et al [8], who reported age as an independent predictor of hypertension among police personnel. Gender, however, was not significantly associated with hypertension (p=0.350), likely due to the small proportion of female police personnel in the study, similar to observations by Zurmure et al [9].

Anthropometric parameters, such as BMI (p=0.004) and waist-hip ratio (p=0.017), showed significant association with hypertension. Mean BMI of hypertensive participants was higher than normotensive participants. These findings are in accordance with Kumar et al [10] and Sen et al [8], who reported that obesity and central adiposity are important risk factors for elevated blood pressure among police personnel.

Occupational factors, including higher police rank (p=0.001) and extended duty hours (p=0.036), were significantly associated with hypertension. Similar results were observed by Chauhan et al [6], highlighting that higher responsibility and prolonged working hours increase occupational stress and risk of hypertension.

Lifestyle factors such as tobacco use (p=0.001) and alcohol consumption (p=0.016) were significantly associated with hypertension in the present study. These findings align with Kumar et al [10] and Sen et al [8], indicating that unhealthy habits exacerbate cardiovascular risk among police personnel.

Co-morbidities such as diabetes, asthma, and cardiovascular disease showed significant association with hypertension (p=0.001), consistent with observations by Satapathy et al [11] and Zurmure et al [9], who emphasized the clustering of non-communicable diseases in police personnel.

Socio-demographic factors, including living away from family (p=0.011) and religion (p=0.001), were also associated with hypertension in the present study. Living away from family may contribute to stress and unhealthy lifestyle behaviors. The association with religion may reflect dietary and cultural practices, but further studies are needed to confirm these findings.

Overall, the present study highlights that age, anthropometric measures, occupational stress, lifestyle habits, and co-morbidities are key determinants of hypertension among police personnel. These findings underscore the need for regular health screening, lifestyle modification programs, stress management interventions, and workplace health promotion to reduce the burden of hypertension in this high-risk population.

Strengths and Limitations: The strengths of our study include complete enumeration of police personnel posted in Jhalawar city and comprehensive assessment of socio-demographic, occupational, behavioral, and anthropometric risk factors associated with hypertension. The study also included direct blood pressure measurement and one-to-one interviews using a pre-designed and pre-structured questionnaire, which improved the quality of data collection.

Limitations include the single-center study setting and relatively small sample size, which may limit the generalizability of the findings. Being a cross-sectional study, causal relationship between hypertension and associated risk factors could not be established. Information regarding dietary habits, physical activity, tobacco, and alcohol use was self-reported and may be subject to recall bias.

Conclusion

In this study, the prevalence of hypertension among police personnel of District Jhalawar was found to be 17.58%. Significant associations were observed with increasing age, higher BMI, increased waist-hip ratio, living away from family, higher service rank, longer duty hours, tobacco use, alcohol consumption, and presence of comorbidities. These findings highlight the important role of occupational stress and lifestyle-related factors in the development of hypertension among police personnel. Regular health screening, stress management strategies, lifestyle modification, and health education programs are essential to reduce the burden of hypertension and improve the overall health status of this high-risk occupational group.

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