ISSN- 0301-1216
Indian J. Prev. Soc. Med. Vol. 56, No.4, 2025

Prevalence and Association of Behavioral and Physiological Risk Factors for Cardiovascular Diseases (CVDs) in Police personnel of an urban city

Meghana Shukla[1], Meenakshi Mehan[2]

ABSTRACT

Cardiovascular Diseases (CVD) are a leading cause of death in India, with police personnel at elevated risk due to irregular timings and stress. This cross-sectional study aimed to assess the prevalence of leading CVD risk factors among police personnel in an urban Indian city. One police station was randomly selected from each of the 8 administrative divisions of the city (n=394). Data were collected using an adapted WHO STEPS tool covering socio-demographic, lifestyle, and anthropometric factors. The prevalence of modifiable risk factors was high: inadequate fruit and vegetable intake 97.0%; insufficient nut consumption 92.1% and physical inactivity 76.1%. Suboptimal blood pressure and overweight/obesity were 65.7% and 65.8% respectively, while 61.2% had abdominal obesity. Tobacco use was 39.8%. The prevalence of overweight/obesity, abdominal obesity, and hypertension was significantly higher in men ($p<0.001$). Institutionalizing regular screening programs and workplace - based preventive strategies is essential to promote early detection and effective risk management.

Keywords: Behavioral risk factors, Blood Pressure, Cardiovascular Diseases, Non-communicable Diseases, Overweight, Obesity, Police personnel, sub optimal blood pressure.

Authour(s) Details:

1. Research Scholar, Department of Foods & Nutrition, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Sayajigunj, Vadodara, 390002, Gujarat, Contact: 9426760800; **Email**: meghana.shuklaphd@gmail.com, Mobile- 9426760800.
2. Professor (Ex), Department of Foods & Nutrition, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Sayajigunj, Vadodara, 390002, Gujarat, Contact: 9327823531 **Email:** meenakshibakshi.mehan@gmail.com, 9327823531.

Corresponding Address: Meghana Shukla, Research Scholar, Department of Foods & Nutrition, Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda, Sayajigunj, Vadodara, 390002, Gujarat, India, **Email:** meghana.shuklaphd@gmail.com, Contact:9426760800,

Citation: Shukla M, Mehan M. Prevalence and Association of Behavioral and Physiological Risk Factors for Cardiovascular Diseases (CVDs) in Police personnel of an urban city. Indian J Prev Soc Med,2025; 56 (4): **490-496. DOI: https://doi.org/10.5281/zenodo.18046591**

Sequence of Article: **Submission:** 13.09.2025 **Accepted:** 21.11.2025 **Published:** 31.12.2025

Prior Publication: Nil; Source of Funding: Nil; Conflicts of Interest: None, Article # 888/1389

Introduction

Non-communicable diseases (NCDs) are a leading global health concern, responsible for 43 million deaths annually and three-quarters of all non-pandemic deaths. Cardiovascular diseases (CVDs) account for 86% of these, followed by chronic respiratory diseases, diabetes, and cancer. In India, NCDs caused 66% of all deaths in 2019, totaling 5.9 million adult deaths. This number may rise to 55 million by 2030 without effective prevention and control measures[1]. The growing NCD burden poses a serious challenge to national health systems, policies, and socioeconomic development. Globally, and in India, 5 to 6 of the top 10 causes of death are linked to NCDs, with CVDs leading the list[2]. Key modifiable risk factors include tobacco use, poor diet, physical inactivity, harmful alcohol use, and metabolic conditions like high blood pressure, obesity, hyperglycemia, and dyslipidemia[1]. Poor nutrition, prevalent across all six WHO regions, further contributes to CVD-related mortality.

Vocational risk factors, also modifiable, are strongly associated with CVDs. Law enforcement is a stressful profession, with elevated stress-related health risks[3]. Though police recruits are expected to be physically and mentally fit, there is high prevalence of CVD risk factors among them, which increases with years of service[4,5].

Occupational challenges like long hours, irregular meals, poor sleep, and high stress make police personnel particularly vulnerable to obesity, diabetes, hypertension, musculoskeletal issues, and CVDs[6,7]. Globally, CVD risk is lower in women[8], a noteworthy point given the male dominance in the field of law enforcement.

Overall, hypertension is a leading CVD risk factor[9]. High prevalence of CVD risk factors in police personnel like hypertension (38%), overweight/obesity (74.5%), abdominal obesity (86.5%), poor diet (71.8%), and physical inactivity (79.9%) are reported in Indian studies[10, 11, 12, 13]. Most Indian studies have reported on CVD risk parameters only in men. Our study was designed to bridge this data gap and provide sex-distributed data on CVD risk factors to facilitate the designing of comprehensive behavioral intervention strategies. Further, there is paucity of detailed data on CVD risk factors such as suboptimal blood pressure/hypertension, tobacco use, poor diet, abdominal obesity and overweight among police personnel[5,14].

Objective: To assess the prevalence of CVD risk factors among police personnel in an urban Indian city.

Methodology

Study design and setting: This cross-sectional study aimed to identify leading CVD risk factors among police personnel aged 21–58 years in an urban Indian city. There were 21 police stations in the city during the study period (June to July 2023). One police station was randomly selected from each division of the 8 divisions, and data were collected from all8 selected police stations.

Sample size: The sample size was decided based on the study by Parkash et al. (2019)[10] who reported a prevalence of 36.4% for hypertension in police personnel of this city. Cluster sampling was done for the 3238 police personnel, and a sample size of 324 was estimated (95% confidence interval and 5% error margin). However, all subjects from each cluster who consented (n=394) were enrolled.

Study tools: Data were collected using a pre-tested, adapted version of the WHO STEP wise approach to NCD surveillancequestionnaire[15]. In STEP 1, data on behavioral risk factors like tobacco use, alcohol consumption, physical activity, fruit and vegetable intake, and nuts and seeds consumption were collected. STEP 2 focused on biophysical and anthropometric measurements. The WHO STEP wise protocol was followed for collecting anthropometric data (weight, height, and waist circumference) and BP measurements. Weight was measured in kilogram using a calibrated digital bathroom weighing scale, height was recorded in centimeters using a portable stadiometer, and waist circumference was measured in inches using a constant tension tape, and BP with a calibrated OMRON BP device (OMRON HEM – 7121J). Three consecutive readings for each parameter were taken, and the average was used for analyses. Interviews and measurements were performed by the principal investigator in the local language after standardizing all instruments.

Tobacco use in any form during the month before the survey was recorded as tobacco usage. The criteria and guidelines for risk factors are mentioned in Table-1.

Variable	Condition	Criteria Guidelines
Body Mass Index (BMI)	Overweight >23.0 kg/m^2 Obesity >25.0 kg/m^2	Asia Pacific Guidelines 2020
Abdominal Obesity	> 90 cm (men) > 80 cm (women)	ATP III (Asian) 2001
Hypertension	SBP ≥ 130 mmHg, DBP ≥ 80 mmHg or management of pre-existing hypertension	AHA 2017
Poor Dietary intake	<400 gm fruits and vegetables/day and <1 fist of nuts/ day	WHO 2013
Physically inactive	≥150 minutes of moderate-intensity physical activity or ≥75 minutes of vigorous-intensity physical activity	WHO 2010

SBP: Systolic Blood Pressure; **DBP:** Diastolic Blood Pressure; **RBS:** Random Blood Sugar; **ATP:** Adult Treatment Panel III; **AHA:** American Heart Association; **WHO:** World Health Organization

Ethical considerations: Ethical approval was obtained from the Institutional Ethics Committee for Human Research (Ethical No.: IECHR/FCSc/Ph.D/2021/128). Written informed consent was obtained from all participants before enrolment.

Statistical analyses: Data were entered into Microsoft Excel and analyzed using JASP0.19 and Jamovi 2.3.28. Univariate, bivariate, and multivariate analysis were performed. Pearson's Chi-square test and binomial logistic regression were used

to compare differences and evaluate associations between the risk factors. Statistical significance was considered at $p<0.05$.

Results

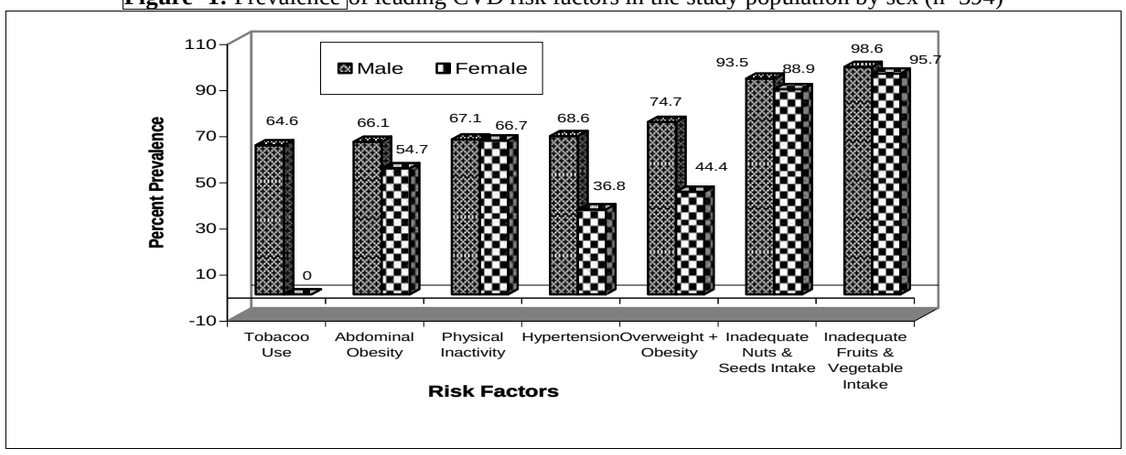
Most subjects were young adults (67.5%), and the mean population age was 37.4 ± 10.3(21–59) years. Majority subjects were men (70.3%), married (92.6%), and living with family (87.3%). High prevalence of behavioral risk factors was observed. Almost all participants had suboptimal consumption of fruits and vegetables (97.0%) as well as nuts and seeds (92.1%), irrespective of age and sex. Physical inactivity was very common (76.1%) and comparable in men and women (75.2 % vs. 71.9%, respectively) and between younger and older adults (66.9% vs. 67.2%, respectively). In total, 39.8% male subjects currently used tobacco (smoking/chewable), and with significantly higher prevalence among older adults (21–40 years) (50.8%) than in younger adults (41–59 years)(35.0%). These details are presented in Fig.-1 and Table-2.

Table-2: Age and Sex wise distribution of Key Cardiovascular Risk Factors in the study population (N=394)

Risk Factors	Age Range					Sex				
	Young adults (21–40 years)		Older adults (41–59 years)		P value	Male		Female		P value
	No.	%	No.	%		No.	%	No.	%	
Tobacco Use	93	35.0	65	50.8	<0.001**	179	64.6	0	0.0	<0.001**
Inadequate Fruit & Vegetable Intake	259	97.4	126	98.4	0.51	273	98.6	112	95.7	0.08
Inadequate Nuts & Seeds Intake	246	92.5	117	91.4	0.71	259	93.5	104	88.9	0.12
Physical Inactivity	178	66.9	86	67.2	0.96	186	67.1	78	66.7	0.92
Overweight+ obesity	145	54.5	114	89.1	<0.001**	207	74.7	52	44.4	<0.001**
Abdominal Obesity	131	49.2	116	90.6	<0.001**	183	66.1	64	54.7	0.03*
Hypertension	139	52.3	94	73.4	<0.001**	190	68.6	43	36.8	<0.001**

More than half of the subjects were overweight or obese (65.7%), had abdominal obesity (62.7%), and were hypertensive (59.1%). Men and older adults had significantly higher prevalence of all three risk factors than women and younger adults, respectively (Fig.-1, Table-3). Most hypertensive subjects (86.2%) were those who were newly diagnosed during our study and 6.6% of the subjects with elevated blood pressure were unaware of their condition.

Figure -1: Prevalence of leading CVD risk factors in the study population by sex (n=394)



The mean BMI was 24.3 ± 3.48 kg/m^2, and average waist circumference was 89.8±10.8 cm, with significantly higher values in men ($p<0.001$). The mean systolic BP SBP and diastolic BP DBP values were 127±17.2 and 83.2±10.7 mmHg, respectively. The population mean for all risk factors were above the normal range. The population mean for all the physiological risk factors were above the normal range. The means for BMI, SBP, DBP and WC were significantly higher ($p<0.001$) in older

subjects >40 years than their younger (<40 years) counter parts. These means were also significantly higher (p<0.001) in males in comparison to the female subjects.

Table-3: Association between NCD risk factors and health outcomes

Predictor	Overweight + Obesity BMI ≥23.0 kg/m^2) OR 95% CI)	p value	Hypertension SBP/DBP - >130/90mmHg) OR 95% CI)	p value	Abdominal Obesity M >90cm; F >80cm) OR 95% CI)	p value
Inadequate Fruit & Vegetable intake	0.95 (0.22–3.87)	0.942	0.42 (0.09 – 1.93)	0.261	0.86 (0.20 – 3.63)	0.835
Inadequate Nuts & Seeds intake	1.24 (0.52–3.02)	0.632	1.06 (0.47 – 2.36)	0.896	1.53 (0.64 – 3.67)	0.338
Tobacco Use	1.21 (0.67–2.16)	0.535	0.91 (0.53–1.57)	0.738	1.34 (0.75 – 2.38)	0.320
Physical Inactivity	1.30 (0.80–2.10)	0.294	1.17 (0.74–1.85)	0.504	1.15 (0.73 – 1.86)	0.570
Age Younger vs Older	0.40 (0.22–0.74)	0.003*	1.69 (1.02–2.80)	0.040*	9.89 (5.14–19.00)	<0.001**
Sex	5.44 (2.93–10.12)	<0.001**	0.32 (0.18–0.58)	<0.001**	1.17 (0.64–2.14)	0.610

In multivariable logistic regression analysis age and sex emerged as significant predictors of cardio-metabolic risk factors. Compared to younger adults, older adults had significantly higher odds of hypertension OR 1.69, 95% CI 1.02–2.80) and abdominal obesity OR 9.89, 95%; CI 5.14–19.0). Females were at higher risk of overweight/obesity OR 5.44, 95%; CI 2.93–10.12), but demonstrated a protective effect against hypertension OR 0.32, 95% (CI 0.18–0.58). No significant sex differences were observed for abdominal obesity. Dietary behaviors low fruit/vegetable intake, inadequate nuts & seeds intake), tobacco use, and physical inactivity were not significantly associated with any of the outcomes (Table-4).

Discussion

The mean participant age was 37.4 ± 10.3 years, consistent with Kumar et al. (2023), who reported a similar mean age of 34.6 ± 7.9 years. Although males comprised the majority of our study population 70.3%), substantial proportions were female 29.7%. This contrasts with previous studies by Bhatia and Pandit (2017) [11] and Kumar et al. (2023), which included predominantly male participants 95.1% and 92%, respectively), limiting the assessment of risk factors in female personnel. In comparison, the more balanced sex distribution in our study allowed for more accurate analysis of CVD risk factors among female participants and enabled exploration of sex-based differences.

Overall, we observed a high prevalence and strong association of NCD risk factors among police personnel. The prevalence of hypertension (59.1%) in our study is consistent with findings from similar studies: 51% reported by Bhatia and Pandit (2017)[11] in the same urban city, 67.9% by Chauhan et al. (2022)[17] in Gwalior, and 60.5% by Yates et al. (2021)[18] in South East England. All studies, including ours, applied the same cutoffs and classification criteria based on the AHA 2017 guidelines. Some studies have reported a slightly lower prevalence of hypertension compared to our findings[5, 10. 19, 20], possibly due to smaller sample sizes and inclusion of both operational and non-operational staff. The proportion of newly diagnosed hypertensive individuals in our study (86.3%) aligns with that reported by Jitendra et al. (2016)[12] in Delhi 80.5% .

The significantly higher prevalence of hypertension among older subjects in our study is in keeping with the trends reported previously[21,10,12].

Previous epidemiological studies have also reported significant sex-based differences in the prevalence of hypertension, in favor of women[22, 16,17], similar to our findings, where significantly more men had hypertension than women 68.6% vs.36.8%, respectively). This could be due to the cardio-protective effect exerted by estrogen and progesterone in women during their reproductive years[23].

The prevalence of overweight/obesity among police personnel in our study (65.7%) is comparable to previous reports; Vijeth et al. (2018)[24] reported 61% in Karnataka, Greeshma et al. (2024)[5] reported 65% in Kerala, and Alghamdi et al. (2017)[25] reported 66.9% in Riyadh. However, some studies reported higher figures: Kumar et al. (2023)[16] observed 85.72% prevalence in Pune, and Rathi et al. (2018)[26] reported 71.8% in Delhi. In contrast, Bhatia and Pandit (2017) [11] documented a lower prevalence of 45% in Vadodara. The rising global trend in overweight and obesity, as noted by the Lancet (2025), may explain the higher prevalence in our study. Furthermore, the higher prevalence of overweight/obesity among men in our sample aligns with findings from Gu JK et al. (2012)[27] in Northeast USA and Vijeth et al. (2018)[24] in Karnataka.

Our findings on physical activity levels are noteworthy. Although police personnel are expected to be physically active, 76.1% of them were physically inactive. This trend was previously reported by Nagendra 2019 (75%)[28] in their study on Bangalore City Police Department personnel. However, Greeshma et al (2024)[5] and Kumar et al, (2023)[16], reported lower prevalence of physical inactivity in Kerala (35%) and Pune (33%), respectively. These differences in the physical activity levels could be attributed to shift hours and perceived stress in the police force in different cities or locations[29].

Tobacco use smoking and chewable forms) was high (39.8%) in our study, similar to that reported by Singh et al.(2016) in their study in Madhya Pradesh (55%) and by Jankowski et al. (2021) in their study in Poland (54.6%). However, lower prevalence was reported by other studies (4.3% to 31.7%) conducted in Kerala[5], Pune[16], Bangladesh[32], and Vadodara[11]. In our study, tobacco use was not significantly associated with hypertension p<0.001) after adjusting for age and sex, contrary to the reports by Kumar et al.(2023)[16] in Pune and Mallik et al. (2014)[13] in West Bengal where tobacco use was a potential risk factor for hypertension.

The prevalence of inadequate fruit, vegetable, nuts & seeds intake was 97.0% and 92.1% respectively in the current study. However, no significant association was identified with hypertension and other risk factors. A similar prevalence rate (92%) for inadequate fruit and vegetables was reported by Greeshma et al (2024)[5] in Kerala. The high prevalence of unhealthy food habits reported here is a universal trend reported across populations from various professions. The lack of healthy dietary habits may be more pronounced in this population owing to the greater variation and unpredictable work hours of police personnel that make it challenging for them to follow healthy dietary habits[33].

Conclusion

The present study highlights a significant burden of CVD risk factors among police personnel in urban India. This underscores an urgent need to integrate early identification, risk management, and systematic follow-up into the health infrastructure of police departments, moving beyond the current model of outsourced health check-ups with limited continuity of care. Given the high prevalence of hypertension, obesity, physical inactivity, tobacco use, and unhealthy dietary habits, it is imperative to establish a structured, routine health screening program supported by stratified risk assessment, targeted interventions, and regular monitoring.

References

1. World Health Organization. Non-communicable diseases: Key facts. Https, 2023.
2. World Health Organization. Global Health Estimates 2019: Deaths by cause, age, sex, by country and by region, 2000–2019. Geneva: World Health Organization. https://www.who.int/data/gho/data/themes/mortality-and-global-health-estimates, 2020.
3. Habersaat SA, Geiger AM., Abdellaoui S. & Wolf JM. Health in police officers: Role of risk factor clusters and police divisions. Social Science & Medicine (1982), 2025, 143: 213–222. https://doi.org/10.1016/j. socscimed.2015.08.043
4. Ramakrishnan L., Ramachandran R., & Selvaraj K. High prevalence of cardiovascular risk factors among policemen in Puducherry, South India. Indian Journal of Public Health, 2013, 574: 261–265. https://doi.org/10.4103/0019-557X.120988
5. Greeshma J., Mini GK., Marthanda Pillai A., & Irazola V. Cardiovascular disease risk factor prevalence among police officials: findings from a cross-sectional study in Kerala, India. Journal of Occupational Health, (661), uiae025. https://doi.org/10.1093/joccuh/uiae025, 2024.

6. Almale BD., Vankudre AJ., Bansode-Gokhe SS, & Pawar VK. An epidemiologic study of occupational stress factors in Mumbai police personnel. Indian journal of occupational and environmental medicine, 2014, 183:109–112. https://doi.org/ 10.4103/0019-5278.146906
7. Magnavita N., & Garbarino S. Is absence related to work stress? A repeated cross-sectional study on a special police force. American journal of industrial medicine, 2013, 567: 765–775. https://doi.org/10.1002/ajim.22155
8. Weidner G. Why do men get more heart disease than women? An international perspective. Journal of American college health : J of ACH, 2000, 486: 291–294. https://doi.org/10.1080/07448480009596270
9. Kjeldsen SE. Hypertension and cardiovascular risk: General aspects. Pharmacological research, 2018, 129: 95–99. https:// doi.org/ 10.1016/j.phrs.2017.11.003
10. Parkash J., Kalhan M., Singhania K., Punia A., Kumar B., & Kaushal P. Prevalence of hypertension and its determinants among policemen in a city of a, India. International Journal of Applied and Basic Medical Research, 2019, 93: 143–147. https://doi.org/10.4103/ijabmr.IJABMR_356_18
11. Bhatia KM., & Pandit N. Prevalence of Chronic Morbidity and Sociodemographic Profile of Police Personnel - A Study from Gujarat. Journal of Clinical and Diagnostic Research: JCDR, 2017, 119: LC06–LC09. 2016, https://doi.org/10.7860/ JCDR/ 2017/ 27435.10586
12. Jitendra Kumar R., & Meena G. Hypertension and its correlates among police personnel in National Capital Region NCR), India. Journal of Hypertension, 2016, 34 (Supplement 1), e461. https://doi.org/ 10.1097/01.hjh.0000501220.94965.44
13. Mallik D., Mukhopadhyay DK., Kumar P., & Sinhababu A. Hypertension, prehypertension, and normo-tension among police personnel in a district of West Bengal, India. The Journal of the Association of Physicians of India, 2014, 6211:12–16.
14. Sen S., Saha S., & Saha S. Prevalence of hypertension and its associated risk factors among Kolkata-based policemen: A socio-physiological study. Journal of Hypertension, 2014, 34 Supplement (1), e461. https://doi.org/ 10.1097/ 01.hjh. 0000501220. 94965.44
15. World Health Organization. STEP wise approach to surveillance STEPS. https://www.who.int/ teams/ non-communicable-diseases/surveillance/systems-tools/steps
16. Kumar A., Gautam P., & Pore P. Prevalence of hypertension and its associated risk factors among police personnel of a metropolitan city. Asian Journal of Medical Sciences, 2023, 143: 122–129. https://doi.org/ 10.3126/ ajms.v14i3.50019
17. Chauhan VS., Bansal M., Sharma V., & Gupta R. Prevalence and Risk Factors of Hypertension among Police Personnel of District Gwalior- A Cross Sectional Study. Indian journal of community medicine : official publication of Indian Association of Preventive & Social Medicine, 2022, 473: 379–385. https://doi.org/10.4103/ijcm.ijcm_1154_21
18. Yates JD., Aldous JWF., Bailey DP., Chater AM., Mitchell ACS., & Richards JC. The Prevalence and Predictors of Hypertension and the Metabolic Syndrome in Police Personnel. International Journal of Environmental Research and Public Health, 1813), 6728. https://doi.org/10.3390/ijerph18136728, 2021.
19. Ganesh KS., Naresh AG., & Bammigatti C. Prevalence and Risk Factors of Hypertension Among Male Police Personnel in Urban Puducherry, India. Kathmandu University medical journal KUMJ), (1248), 2014, 242–246. https://doi.org/10.3126/ kumj.v12i4.13728
20. Prajapati A., Raju T, & Ramasamy, A. Prevalence and risk factors of hypertension among male police personnel in urban Puducherry, India. International Journal of Medical Science and Public Health, 2014, 32:169–173. https://doi.org/ 10.5455/ ijmsph.2014.030220141
21. Wang R., Vetrano DL, Liang, Y, & Qiu, C. The age-related blood pressure trajectories from young-old adults to centenarians: A cohort study. International journal of cardiology, 2019, 296: 141–148. https://doi.org/ 10.1016/ j.ijcard.2019.08.011
22. Mohanty SK., Bansal P., Kalra S., Yerramalla M., & Dwivedi SN. Awareness, treatment, and control of hypertension in adults aged 45 years and over and their spouses in India: A nationally representative cross-sectional study. BMJ Open, 2021, 1112: e053664. https://doi.org/10.1136/bmjopen-2021-053664

23. Iorga A., Cunningham CM., Moazeni S., Ruffenach G., Umar S., & Eghbali M. The protective role of estrogen and estrogen receptors in cardiovascular disease and the controversial use of estrogen therapy. Biology of sex differences, 2017, (81): 33. https://doi.org/10.1186/s13293-017-0152-8

24. Vijeth SB., & Ghouse Pasha VKSR. Prevalence of obesity and its associated risk factors among policemen of Chitradurga district, Karnataka, India. International Journal of Advances in Medicine, 2018, 54: 1226–1230. https://doi.org/ 10.18203/ 2349- 3933.ijam20183847

25. Alghamdi, A.S., Yahya, M.A., Alshammari, G.M. et al. Prevalence of overweight and obesity among police officers in Riyadh City and risk factors for cardiovascular disease. Lipids Health Dis **16**, 79 2017). https://doi.org/10.1186/s12944-017-0467-9

26. Rathi, K., & Singh, K. 2018). Assessment of weight status among police head constables in Delhi. International Journal of Health Sciences and Research, 2018, 81: 209–214. Retrieved from https://www.ijhsr.org/ IJHSR_Vol.8_ Issue.1_ Jan 2018/31.pdf

27. Gu JK., Charles LE., Burchfiel CM., Fekedulegn D., Sarkisian K., Andrew ME, Ma C., & Violanti JM. Long work hours and adiposity among police officers in a US northeast city. Journal of occupational and environmental medicine, 2012, 5411; 1374–1381. https://doi.org/10.1097/JOM.0b013e31825f2bea

28. Nagendra, A. 2019). Dietary habits and nutritional screening of Bangalore City Police. Indian Journal of Nutrition, 63), 205. https://doi.org/10.25259/IJN_86_2019

29. Violanti JM., Fekedulegn D., Hartley TA., Andrew ME., Burchfiel CM., & Charles LE. Shift work and health among police officers: Evidence from the Buffalo Cardio-Metabolic Occupational Police Stress BCOPS) study. Journal of Occupational and Environmental Medicine, 2019, 613; 193–201. https://doi.org/ 10.1097/ JOM. 0000000000001527

30. Singh A., Bhambal A., Saxena S., Tiwari V., & Tiwari U. Frequency of Addictive Habits and its Association with Oral Diseases Among a Cross Section of Indian Police Personnel Connotation. Journal of the College of Physicians and Surgeons--Pakistan: JCPSP, 2016, 265; 403–407.

31. Jankowski M., Gujski M., Pinkas J., Opoczyńska-Świeżewska D., Krzych-Fałta E., Lusawa A., Wierzba W., & Raciborski F. The prevalence of cigarette smoking, e-cigarette use and heated tobacco use among police employees in Poland: a 2020 cross-sectional survey. International journal of occupational medicine and environmental health, 2021, 345; 629–645. https://doi.org/10.13075/ijomeh.1896.01805

32. Khan MK, Hoque HE, & Ferdous J. Knowledge and Attitude Regarding National Tobacco Control Law and Practice of Tobacco Smoking among Bangladesh Police. Mymensingh Medical Journal : MMJ, 2019, (284), 752–761.

33. RA Mary, Vaishali P., & Parasuraman G. Beyond the Badge: A Scoping Review Among Police Personnel in South India Exploring the Impact of Yoga and Health Education on Cardiovascular Health. Cureus, 2024, 169, e68370. https://doi.org/10.7759/cureus.68370