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Prevalence of Obesity and its determinants among Policemen in a city of Haryana, India

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Abstract
Introduction: *Obesity is an important modifiable risk factor for most chronic non-communicable diseases. In past few decades issue of overweight and obesity has become a serious public health concern throughout the world. Police work has been regarded by some researchers as one of the most stressful occupations in the world.*
Material and Methods: *A cross-sectional study was carried out during 2016-17 among 450 policemen posted in Rohtak city of Haryana. Data were collected using pre-designed, pre-tested, semi-structured interview schedule and analysed using SPSS version 20.0.*
Results: *A total of 335 (74.4%) out of 450 subjects were found to be obese. Duration of service, socio-economic status, tobacco smoking are significantly associated with prevalence of obesity among policemen.*
Conclusion: *Obesity in policemen has emerged as an important public health problem. Knowledge of risk factors for obesity may give tracks for prevention in this population. Therefore it is the need of hour to devise a sound screening strategy to diagnose obesity among policemen and its early management.*
Keywords: *Obesity, Policemen, risk factors.*

Introduction

Overweight and obesity are defined as abnormal or excessive fat accumulation in the body that may impair health. Overweight and obesity are leading risks for mortality worldwide. Obesity causes around 3.4 million adult deaths each year.[1] Obesity increases the likelihood of diabetes, hypertension, coronary heart disease, stroke, certain cancers, obstructive sleep apnoea and osteoarthritis. It also negatively affects reproductive performance. Overweight and obesity– i.e. BMI ≥25 kg/m2 and ≥30 kg/m2 respectively – were estimated to account for 3.4 million deaths per year and 93.6 million DALYs in 2010.[2]

Obesity has been increasing in all countries. In 2014, 39% of adults aged 18 years and older (38% of men and 40% of women) were overweight. The worldwide prevalence of obesity nearly doubled between 1980 and 2014. In 2014, 11% of men and 15%of women worldwide were obese. Thus, more than half a billion adults worldwide are classed as obese.[3]

In India, 5% of the population is obese. Obesity is not an immediately fatal disease by itself, but is a risk factor for wide range of serious non-communicable diseases in Indian population.[4]

Obesity is most widely measured in terms of body mass index (BMI).[5] According to WHO, the desirable BMI cut-offs for Asians is considered to be between 18.5 and 22.9 kg/m2. A BMI of 23–24.9 kg/m2 is considered as overweight and >25 kg/m2 as obese.[6]

According to National Family Household Survey (NFHS IV) (2015-16) 18.6% adults aged 15-54 years were obese according to BMI$\geq$25 kg/m^{2}in India[7]and 20% in Haryana.[8]

The Police personnel are a vulnerable group as far as risk of NCDs is concerned because of their job profile. They are the law enforcement personnel. They deal on a regular basis with an assortment of unique situations and stressors. The shock of each tragedy and violent event takes a cumulative physical and mental toll on each police officer in some way or the other. Police work has been regarded as one of the stressful occupations in the world.[9]

On an average, Police personnel work 12 hours a day and sometimes even put in 36 hours at a stretch during VIP arrangements and festivals. To relieve themselves from this occupational stress, the policemen tend to stick to unhealthy habits such as smoking, consumption of alcohol and smokeless tobacco, irregular dietary pattern and they are not habituated in leisure time physical activity. High blood pressure, diabetes and obesity are the result of their stressful work which requires timely attention to maintain good health lifelong.[10]

As no study has been carried out in the police personnel of Haryana, our study aimed to provide the baseline information on prevalence of obesity among policemen, and identify the associated risk factors for obesity in this population.

Objectives of study
1. To study the prevalence of obesity among police men
2. To study the socio-demographic factors associated with obesity

Material and Methods
Study design and Study participants
A cross-sectional study was carried out from July 2016 to June 2017among 450 policemen posted in Rohtak city of Haryana.

Inclusion Criteria
Serving policemen who have had at least 1 year of service.

Exclusion Criteria
Those who were not willing to participate in the study.

Sample size calculation and sampling technique
Rohtak city has 7 police stations, CIA (Crime Investigating Agency) Staff, Police Line, 1 women police station, traffic staff and office of Police Department. Assuming the prevalence of obesity as 34.1% (as per Sen et al[11]) and allowable error of 15% at 95% level of significance and using the formula N=4pq/L^2, the calculated sample size was 344. But for the purpose of the study, a sample size of 450 eligible subjects was taken. Before conducting the study, a written permission was sought from Superintendent of Police, Rohtak. List of all policemen was obtained from office of Superintendent of Police, Rohtak. A total of 944 police men were posted as per the eligibility criteria. Out of them, 450 policemen were selected randomly from list. The investigator visited all police stations at a time convenient to the study subjects. A written informed consent was obtained from all the participants after explaining in details

the aims and objectives of the study. Sociodemographic details were obtained using pre-designed, pretested and semi-structured interview schedule.

Anthropometric measurements such as height, weight, waist and hip circumference were made using standard techniques.[12]

Waist to hip circumference ratio (WHR) was calculated according to WHO guidelines. Truncal obesity was diagnosed when WHR was >0.88 and abdominal obesity when WC was > 90 cm in men.[13]

(v)Body mass index (BMI) is defined as weight in kilograms divided by the square of the height in meters (kg/m^2). Asia Pacific classification for BMI was used for the study.[13]

Study tool: A pre-designed, pretested and semi-structured interview schedule

Data compilation and analysis: Data collected was compiled and analyzed by using Statistical Package for Social Sciences (SPSS) version 20.0. The study was done using 95% confidence interval. p value <0.05 was considered statistically significant. Pearson's chi square test was used to evaluate differences between groups for categorized variables.

Results

A total of 335 outof 450 subjects were found to be obese, so the prevalence of obesity came out to be 74.4% in our study.

Table 1: Distribution of study subjects according to BMI cut off for Asian Indians (n=450)

Category (BMI)	Frequency	Percentage
Normal (18.5-22.9)	62	13.7
At risk (23-24.9)	53	11.8
Obese I (25-29.9)	237	52.7
Obese II (30 and above)	98	21.8

According to BMI cut off of obesity for Asian Indians, only 13.7% were in the normal range of BMI. More than half (52.7%) were found to be obese class I, 21.8 % obese class II and 11.8% at risk.

Table 2: Distribution of study subjects according to abdominal and truncal obesity (n=450)

Abdominal obesity	Frequency	Percentage
Yes	354	78.7
No	96	21.3
Truncal obesity		
Yes	404	89.8
No	46	10.2

More than 3/4th (78.7%) subjects had abdominal obesity. Almost 90% had truncal obesity.

Table 3: Association of obesity with various factors

Categories	Obesity		χ2	p value
	Normal	Obese		
Age group(Yrs)				
20-29	6 (23.1)	20 (76.9)	3.392	.335
30-39	25 (25)	75 (75)		
40-49	38 (21.6)	138 (78.4)		
50 and above	45 (30.4)	103 (69.6)		
Service duration (yrs)				
<10	31 (32.3)	65 (67.7)	10.41	0.015
10-19	20 (18.2)	90 (81.8)		
20-29	41 (22.3)	143 (77.7)		
30 and above	22 (36.7)	38 (63.3)		
Education				
Matriculation	62 (26.6)	171 (73.4)	1.22	0.748
Senior secondary	22 (21.3)	81 (78.7)		
Graduate	25 (25.8)	72 (74.2)		
Post graduate and above	5 (29.4)	12 (70.6)		
Rank				
Constable	36 (29.5)	86 (70.5)	7.08	.069
Head constable	22 (26.8)	60 (73.2)		
Assistant sub inspector	35 (19.1)	148 (80.9)		
Sub inspector	21 (33.3)	42 (66.7)		
Income (Rs) BG Prasad Category				
6261 and above	88 (23.6)	284 (76.4)	7.011	.030
3130-6260	22 (30.5)	50 (69.5)		
1878-3129	4(66.7)	2 (33.3)		
Tobacco smoking				
Yes	63 (33.3)	126 (66.7)	11.025	.001
No	51 (83.6)	10 (16.4)		
Alcohol use(Ever)				
Yes	79 (26.6)	218 (73.4)	.740	.390
No	35 (22.9)	118 (77.1)		

(Figures in parenthesis indicate percentage)

In table 3, prevalence of obesity increased with increase in socioeconomic status. Prevalence of obesity was more in smokers (66.7%) as compared to non smokers (16.4%). Association of obesity came out to be significant with service duration (p=.015), socioeconomic status (p=.030) and tobacco smoking (p=.001).

Discussion

Obese individuals have an increase in fatty tissue that increases their vascular resistance and in turn increases the work the heart has to do to pump blood throughout the body, thus more prone to develop hypertension. In our study by using BMI cut off for Asian Indians, only 13.3% were lying in normal range of BMI. Around ¾ th (74.5%) study participants were obese [more than half (52.7%) were in obese class I and 21.8 % in obese class II]. 11.8% were at risk (Table 1). This prevalence was much higher in our study as compared to studies conducted by Tharkar et al[14], Ramakrishnan et al[15], Ghosh et al[16]and Sen et al[11]in which prevalence of obesity was 62.9%, 51.6%, 48.15% and 34.1% respectively in these studies using BMI cut off for Asian Indians. Prevalence of obesity was quite low in study by Ganesh et al[17]and Jahnavi et al[18] which was 8.1% and 7% respectively. Reason for such low prevalence may be WHO criteria for obesity used in these studies which has a higher cut off than that used in our study. In a study conducted by Almale et al[19], 20% were obese and 48% pre-obese, however criteria used was WHO classification.

Reason for higher prevalence of obesity in our study may be due to difference in dietary habits which may be attributed to regional variability, more sedentary lifestyle and more addiction habits i.e. tobacco smoking which is often associated with unhealthy eating habits.

Prevalence of obesity in our study came out to be much higher than study conducted among urban population of Shivamogga, Karnataka in general population by Nagendra et al[20] where it came out to be 28.4% in males.

In our study association of obesity came out to be significant with service duration (p=.015), socioeconomic status (p=.030) and tobacco smoking (p=.001).(Table 3)

Abdominal obesity has got a stronger association with coronary heart diseases as compared to BMI. Nearly 4/5th (78.7%) subjects were obese according to abdominal obesity in our study (Table 2) which were higher than found in Ramakrishnan et al[15], Sen et al[11]and Tharkar et al[14]which showed prevalence of abdominal obesity as 71.5%, 66.3% and 65.1% respectively. Truncal obesity judged by increased waist-hip ratio (WHR) is an important risk factor for atherosclerosis.. In our study 89.8% were having truncal obesity (Table2). Similarly high prevalence of truncal obesity was reported by Sen et al[11] and Ramakrishnan et al[15] i.e. 94.7% and 91.4% respectively.

Conclusion

Obesity in policemen has emerged as an important public health problem.. Therefore it is the need of hour to devise a sound screening strategy to diagnose obesity among policemen at an early stage and comprehensive strategy for management which includes timely diagnosis, appropriate treatment, adoption of healthy lifestyle and healthy dietary habits.

Recommendations

Regular screening health camps should be conducted to screen policemen for obesity and other NCDs at an early stage. Those at risk should be identified so that appropriate interventions can be instituted to prevent further progression of disease.

References

1. WHO Western Pacific Region. Obesity: Fact sheet N°311 [Internet]. 2017. Available from: http://www.wpro.who.int/mediacentre/fact sheets/obesity/en/

2. 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. doi:10.1016/S0140-6736(12)61766-8.

3. World Health Organization. Global Status Report on noncommunicable diseases 2014 [Internet]. Geneva: World Health Organization;2014 [cited 2019 May 27]. Available from: http://www.who.int/nmh/publications/ncd-status-report-2014/en/

4. Gothankar JS. Prevalence of obesity and its associated comorbidities amongst adults. Natl J Community Med. 2011;2(2):221-4.

5. Brown CD, Higgins M, Donato KA, Rohde F, Garrison R, Obarzanek E, et al. Body Mass Index and the Prevalence of Hypertension and Dyslipidemia. Obes Res [Internet]. 2000 [cited 2019 May 27];8(9):605–19. Available from: http://dx.doi.org/10.1038/oby.2000.79; PMID: 11225709.

6. Low S, Chin MC, Ma S, Heng DM, Deurenberg Y. Rationale for Redefining Obesity in Asians. Ann Acad Med Singap. 2009; 38(1):66–74.

7. National Family Health Survey 4 (2015-16). Fact Sheet, India [Internet]. Mumbai:Ministry of Health and Family Welfare, Government of India. International Institute for Population Sciences;2016 [cited 2019 May 27]. Available from: http://www.indiaenvironmentportal.org.in/files/file/national%20family%20health%20survey%20-%20India%20fact%20sheet.pdf

8. National Family Health Survey 4 (2015-16). Fact Sheet, Haryana [Internet]. Mumbai: Ministry of Health and Family Welfare, Government of India. International Institute for Population Sciences; 2016 [cited 2019 May 27]. Available from: http://rchiips.org/NFHS/pdf/NFHS4/HR_FactSheet.pdf

9. Anshel MH. A conceptual model and implications for coping with stressful events in police work. Crim Justice Behav. 2000;27(3):375–400.

10. Tambe NN, Singh V, Narang K. A Prevalence Study of Risk Factors for Chronic Diseases among Police Personnel in a Metropolitan. Journal of Recent Trends in Science and Technology. 2012;5(2):61-3.

11. Sen A, Das M, Basu S, Datta G. Prevalence of hypertension and its associated risk factors among Kolkata-based policemen: a socio-physiological study. Int J Med Sci Public Health. 2015;4(2):225-32.

12. World Health Organization. WHO Technical Report Series 854. Physical status: the use and interpretation of anthropometry [Internet]. Geneva: WHO; 1995 [cited 2019 May 27] . Report no.854. Available from http://whqlibdoc.who.int/trs/WHO_TRS_854.pdf

13. World Health Organization. The Asia Pacific Perspective: Redefining Obesity and Its Treatment. Sydney: Health Communications Australia Pty Limited;2000 Feb.p.17-21.

14. Tharkar S, Kumpatla S, Muthukumaran P, Viswanathan V. High prevalence of metabolic syndrome and cardiovascular risk among police personnel compared to general population in India . JAPI. 2008;56:845-9.

15. Ramakrishnan J, Majgi SM, Premarajan KC, Lakshminarayanan S, Thangaraj S, Chinnakali P. High prevalence of

cardiovascular risk factors among policemen in Puducherry, South India. J Cardiovasc Dis Res. 2013;4:112-5.

16. Ghosh A, Mukhopadhyay K, Bera R, Dasgupta R. Prevalence of hypertension and prehypertension among doctors of different specialties in a tertiary-care teaching hospital in Eastern India and its correlation with body mass index. Int J Med Sci Public Health. 2016;5(4):709-13.

17. Ganesh KS, Naresh AGV, Bamigatti C. Prevalence and risk Factors of Hypertension among Male Police Personnel in Urban Puducherry, India. Kathmandu Univ Med J (KUMJ). 2014;12(48):242-6.

18. Jahnavi G, Patra SR, Chandrasekhar CH, Rao BN. Unmasking the health problems faced by the police personnel. GJMEDPH. 2012;1(5): 64-9.

19. Almale BD, GokheSB, Suryawanshi SR, Vankudre AJ, Pawar VK, Patil RB. Health profile of Mumbai police personnel: a cross sectional study. Indian Journal of Forensic and Community Medicine. 2015;2(2):87-90.

20. Nagendra K, C.N, Belur M. A community based study on prevalence of obesity among urban population of Shivamogga, Karnataka, India. Int J Community Med Public Health. 2017;4(1):96-9.