Prevalence of generalized and abdominal obesity in police worker - A cross-sectional study

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ABSTRACT

Background: Police work generally recognized as a most stressful and dangerous occupation. Despite of sufficient physical activity most police worker is suffering from overweight or obesity. There is a scarcity of knowledge regarding prevalence of obesity in police worker in India. This study was conducted to assess the lifestyle-related health problems of the police personnel. **Objectives:** To assess the prevalence of generalized and abdominal obesity (AO) in police worker and to see the association of obesity with nature and duration of service. **Materials and Methods:** This cross-sectional observational study conducted on 245 police personnel working at provincial armed constabulary, Sitapur. After informed consent demographic data of individuals such as age, duration of service, nature of duties, and types of foods were recorded. Anthropometric parameters were measured using standardized techniques. Available data analyze using Chi-square test to see significance of association with different variables. **Result:** In this study, the mean age of individual was 40.34 ± 8.23 and mean duration of service was 23.29 ± 8.49. Majority (95.92%) of police worker were involved in field or shift duty and only 4.08% of individual involved in office work, 77.14% of individuals were having generalized obesity and 82.04% were having AO. According to the duration of service majority of the individuals were obese and their association with AO was highly significant ($P = 0.004$). Nature of job showed that 82.31% of individuals having AO related to field or shift and there association was not significant. **Conclusion:** Effective implementation of a physical fitness program, a regular balanced diet, inoculation of training for managing stress can improve the life of police personnel and make them less prone to be obese and related disorder. Health checkup should be made mandatory to avoid their negligent behavior and early detection of lifestyle-related disorder.

KEY WORDS: Police Personnel; Generalized Obesity; Abdominal Obesity; Body Mass Index; Waist Circumference

INTRODUCTION

Obesity is caused by an imbalance between energy intake and energy expenditure.[1-3] It has been defined by the World Health Organization (WHO) as abnormal or excessive fat accumulation that may impair health. Obesity is one of the most common, yet, among the most neglected, public health problems in both developed and developing countries.[1] Obesity is generally classified as generalized obesity (GO) and abdominal obesity AO.[4,5] According to a study published in the British Medical Journal, the Lancet in 2014; there were 9.8 million obese men in India. Rajendra and Ranjit[6] (2015) in his study found that prevalence of AO as well as of GO was high in India. Extrapolated to the whole country, 153 and 135 million individuals have AO and GO, respectively. There is a scarcity of knowledge regarding prevalence of overweight or obesity in police worker in India. Despite of

sufficient physical activity most police worker is suffering from overweight or obesity. Police work generally recognized as a most stressful and dangerous occupation. Life of police personnel is also different from other occupation. They usually face prolonged stay in field and psychological exhaustion which leads to irregular sleep and poor dietary habits.[7] In an Indian study conducted on urban police of Puducherry,[8] most police officers (68%) ranged in age from 25 to 39 years and having AO was associated with a higher prevalence of hypertension. Epidemiological reports of Reichard and Jackson[9] demonstrated a higher prevalence of obesity among police officers, compared to nonpolice workers because police work is recognized as a dangerous occupation.

Despite high prevalence of obesity in police worker, no previous study addressed the prevalence of overweight and obesity among police worker. Therefore, the present study aimed to see the prevalence of generalized and AO among police worker and its associations with duration and nature of work so that effective dietary and stress reduction program can be designed.

Aims and Objectives

1. To estimate the prevalence of generalized and AO in police worker.
2. To see the association of obesity with nature of work.
3. To see the association of obesity with duration of service.

MATERIALS AND METHODS

This cross-sectional observational study conducted on 245 police employee working at provincial armed constabulary, Sitapur, Uttar Pradesh. Those individuals who have completed 10 years of services included in this study. After informed consent demographic data such as age, duration of service, nature of duties, and types of foods were recorded. Anthropometric parameters were measured using standardized techniques.[10,11] Height (in centimeters) was measured using a measuring scale. The individual was asked to stand upright without shoes with his back against the wall and heels together and eyes directed forward. Weight (in kilograms) was measured with a calibrated electronic weighing scale that was kept on a firm and flat surface. Individuals were asked to wear light clothing and weight was recorded to the nearest 0.5 kg. Body mass index (BMI) was calculated using the formula weight (kg)/height^2 (m). Waist circumference (WC) (in centimeters) was measured by nonstretchable measuring tape at the smallest horizontal girth between the costal margins and the iliac crest at the end of expiration.

Definitions

Overweight is defined as a BMI $\geq$23 kg/m^2 but <25 kg/m^2 for both genders (based on the WHO Asia Pacific Guidelines) with or without AO.[10,11]

GO is defined as a BMI $\geq$25 kg/m^2 for both genders (based on the WHO Asia Pacific Guidelines) with or without AO.[11]

AO is defined as a WC $\geq$90 cm for men and $\geq$80 cm for women with or without GO.[12]

Statistical Analysis

Available data secured in widespread excel data sheet and analyzed using SPSS software 16.0 version. Obtained result was expressed as percentage and mean with standard deviation. Chi-square test was used to see the significance of association between existing variables. Association was considered statistically significant at $P < 0.005$.

RESULT

In this study, the mean age of individual was 40.34 $\pm$ 8.23 and mean duration of service was 23.29 $\pm$ 8.49 (Table 1). Classification of individual according to age showed that 55.1% of individuals belong to 30-40 years age group and 29.39% and 15.51% of individual were in the category of 41-50 years and 51-60 years, respectively (Table 2). Majority (95.92%) of police worker were involved in field or shift duty and only 4.08% of individual involved in office work (Table 3) and there association was not significant. Classification of individual according to BMI which is indicator of GO showed that 77.14% of individuals were obese and 9.8% of individual were overweight (Table 4, Figure 1) and according to WC majority (82.04%) of individuals were having AO (Table 5, Figure 2). Distribution of individual according to the duration of service showed that majority of the individuals were obese and their association with AO was highly significant ($P = 0.004$). Distribution of individual having AO according to the duration of service showed that almost all individuals were suffering from AO majority were those whose duration of service was 21-30 years and 84.21% of individual having AO were in the range of

Table 1: Mean with SD of different variable

Variables	Mean±SD
Age	40.34±8.23
Duration of service	23.29±8.49
BMI	39.67±3.99
WC	99.31±9.11

BMI: Body mass index, WC: Waist circumference, SD: Standard deviation

Table 2: Distribution of individual according to age

Age (years)	*n* (%)
30-40	135 (55.1)
41-50	72 (29.39)
51-60	38 (15.51)
Total	245 (100)

11-20 years duration of service group and the association of AO with duration of service was highly significant *P* = 0.005 (Table 6). Individuals according to nature of job showed that 82.31% of individuals having AO related to field or shift and there association was not significant (Table 7). Distribution of individual having GO according to duration of service showed that majority (89.66%) of individual was in the range of 21 to 30 years duration of service and their association was highly significant p=0.004, (Table-8). Distribution of individual having GO according to nature of duty showed that majority of individuals were related to field or shift duty and their association was not significant (Table 9).

Table 3: Distribution of individual according to nature of work

Nature of job	*n* (%)
Office	10 (4.08)
Field	235 (95.92)
Total	245 (100)

Table 4: Distribution of individual according to BMI

BMI	*n* (%)
Normal	32 (13.06)
Overweight	24 (9.8)
Obese	189 (77.14)
Total	245 (100)

BMI: Body mass index

Table 5: Distribution of individual according to WC

WC	*n* (%)
Normal (85-90 cm)	44 (17.96)
Obese (>90 cm)	201 (82.04)
Total	245 (100)

WC: Waist circumference

Table 6: Association of WC with duration of service

Duration ofservice (years)	Normal (85-90 cm) (%)	Obese (>90 cm) (%)	Total (%)	*P*
≤10	25 (27.17)	67 (72.83)	92 (100)	0.005
11-20	15 (15.79)	80 (84.21)	95 (100)	
21-30	4 (6.9)	54 (93.1)	58 (100)	
Total	44 (17.96)	201 (82.04)	245 (100)	

WC: Waist circumference

Table 7: Association of WC with nature of work

Work place	Normal (85-90 cm) (%)	Obese (>90 cm) (%)	Total (%)	*P*
Field	42 (17.87)	193 (82.13)	235 (100)	0.98 NS
Office	2 (20)	8 (80)	10 (100)	
Total	44 (17.96)	201 (82.04)	245 (100)	

WC: Waist circumference, NS: Not significant

DISCUSSION

Out of 245 individual, 189 (77.14%) was suffering from GO and 201 (82.04%) was from AO. The mean age of participant was 40.34 ± 8.23 and mean duration of service was 23.29 ± 8.49 year. Both types of obesity showed highly significant association with duration of service but no association with nature of duty. Our finding agreement with the finding of Saha et al.[13] who conducted a questionnaire study on 105 police officers working in different police stations from Hoogly District, West Bengal revealed that 56% police officers were suffering from GO. In another cross-sectional study conducted by Jahnavi et al.[14] found that 58% of police personnel were suffered from GO. Similar findings also observed by Alghamdi and Mohammed.[15] The high prevalence of obesity among police officers in this study may be attributable to poor levels of health and nutritional awareness, increased intake of fatty foods and sugars, and a low level of physical activity. 24 h rotation duty of police worker disturbed their sleep pattern leads to irritability and stress. Easily available transport vehicle also curtail their physical activity. The WHO survey report[16-18] also stated that in countries like India, the rise in obesity prevalence
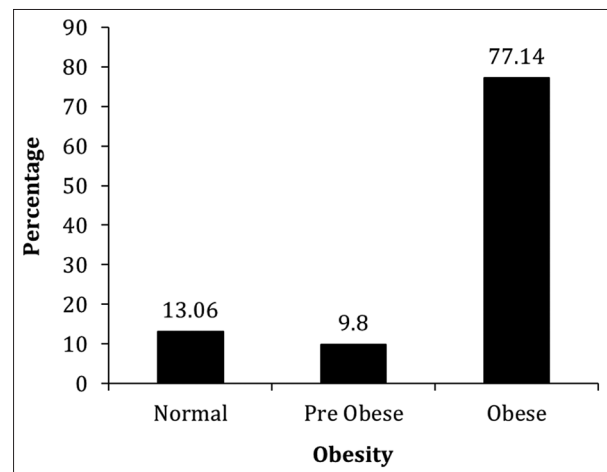

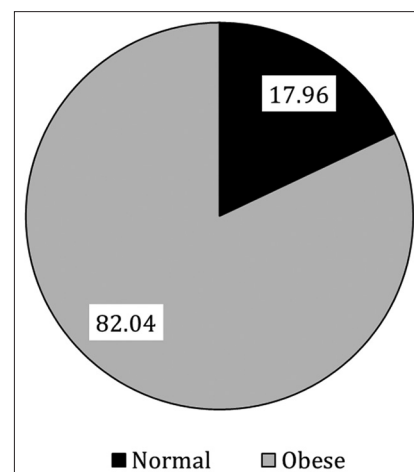**Figure 1:** Distribution of individual according to body mass index

Figure 2: Distribution of individual according to waist circumference

Table 8: Association of BMI with duration of service

Duration (years)	Normal (%)	Pre-obese (%)	Obese (%)	Total (%)	P
≤10	16 (17.39)	16 (17.39)	60 (65.22)	92 (100)	0.004 HS
11-20	11 (11.58)	7 (7.37)	77 (81.05)	95 (100)	
21-30	5 (8.62)	1 (1.72)	52 (89.66)	58 (100)	
Total	32 (13.06)	24 (9.8)	189 (77.14)	245 (100)	

BMI: Body mass index, HS: Highly significant

Table 9: Association of BMI with nature of work

Work place	Normal (%)	Over weight (%)	Obese (%)	Total (%)	P
Field	30 (12.77)	23 (9.79)	182 (77.45)	235 (100)	0.79 NS
Office	2 (20)	1 (10)	7 (70)	10 (100)	
Total	32 (13.06)	24 (9.8)	189 (77.14)	245 (100)	

BMI: Body mass index, NS: Not significant

could be attributed to the increasing urbanization, use of mechanized transport, increasing availability of processed and fast foods, increased television viewing, adoption of less physically active lifestyles, and consumption of more "energy dense, nutrient-poor" diets. This is exemplified by the higher prevalence of both GO and AO in the urban population where the above factors are more common.[17,18] According to world health survey, the prevalence of physical inactivity in India was 9.3% in men. More than 80% of police worker who have completed 20 years of service were obese and showed significant association between duration of service and obesity. As police worker progress in their carriers, their physical activity at work decrease over time[19] contributing to anthropometric changes. Stamford et al.[20] have observed that after 1 year of training, recruits exhibited a dynamic power reduction that impaired their physical capacity for dealing with emergency situations. Shift duty and work-related stress is also a risk factor for obesity. In the study of Gu et al.,[21] male police officers who worked during the night shift had significantly higher values of WCs and BMI. The explanation for this association, according to the same author could be nutritionally inadequate food intake, as the officers who work at night only have access to convenience stored fast food; in other words, they opt for high calories and high fat foods. Shift duty and prolong standing at night change their sleep-wake pattern, changes in the circadian rhythm as well as restricted opportunities to practice physical exercise. Author observed that most of individual having obesity were suffering from hypertension or diabetes but unaware about risk related to it. They found themselves unable to follow dietary advice because they live mostly home away at barrack where only basic necessity items available and fooding depends on mess diet where meal is often low nutrition and high fat containing. In a study conducted in India on 900 policemen, Thayyil et al.[22] have found that 16.8% of them had metabolic syndrome and 65.6% had high BMI.

Therefore, for the clinical management of these chronic conditions and for promoting a better quality of life, lifestyle changes such as a balanced and healthy diet, regular physical activity, and practices that reduce everyday life stress are usually necessary. The need of policies promoting the practice of physical activities, including leisure and sports activities, that promote prevention of obesity related to work, psychological stability, changes in living habits, improvements in health, and therefore, improvements in the quality of life.

CONCLUSION

Effective implementation of a physical fitness program, a regular balanced diet, inoculation training for managing stress can improve the life of police personnel and make them less prone to be obese and related disorder. Health checkup should be made mandatory to avoid their negligent behavior and early detection of lifestyle-related disorder.

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