

# Dietary Habits and Nutritional Screening of Bangalore City Police

## Research Article

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### Abstract

Police personnel play a vital role in any society by ensuring stability and security. Police work has been regarded as one of the stressful occupation in the world. The physical threats in police operational duties have been regarded as inherent causes of stress in police work. As hypertension is one of the major global risks factors, and its prevalence is rapidly increasing worldwide. Individuals with hypertension possess twofold higher risk of developing Coronary Artery Disease (CAD) and four times higher risk of congestive heart failure compared with normotensive subjects. The policing stage is a very important biophysical social process in which an inadequate diet may affect the performance and intellectual capacity of individuals. Therefore attention needs to be given on health, nutrition and life style to prevent chronic diseases. Objective of this study was to assess the dietary habits with nutritional screening and to identify the prevalence of hypertension among police staff. 60 police staff both men and women between ages 20-60 years from Tyagaraj Nagar Police Station, Bangalore were selected as sample for the study. Anthropometric measurements, Dietary history, Systolic and diastolic blood pressures of the police-staff were assessed. Interview method was used to collect the data effectively using a preformed questionnaire. The police-staff presented with a sedentary lifestyle and dietary pattern similar to that prevalent in South India. Increase in the BMI (Body Mass Index) indicated overweight and obesity as per the Asian standards. Systolic Blood Pressure (SBP) showed that Hypertension grade-I (SBP >130 mmHg) and Hypertension grade II (SBP >160 mmHg) was prevalent. Comparison between BMI and health indicators [Blood sugars and Systolic Blood Pressure (SBP>130 mmHg)] showed that BMI >25 among both male and female. As age increased BMI increased. Present study shows BMI indicating obesity. It also gives valuable information regarding the present magnitude of hypertension and certain risk factors among this vulnerable group. A high fat, junk food consumption, sedentary lifestyle, alcohol consumption and long standing effect of this unhealthy lifestyle may be a major cause of obesity with greater risk for the development of chronic diseases. Reduction in consumption of alcohol, balanced diet along with other lifestyle modification may help in prevention and control of hypertension.

**Keywords:** Nutritional status; SBP-systolic blood pressure; DBP-diastolic blood pressure

## Introduction

The Indian Police Service is one of the three All India Services of the Government of India. The Indian Police Service is not a force itself but it provides leaders and commanders to staff the police and All India Central Armed Police Forces. Its members are the senior officers of the police [1]. The Police department is one of the most significant departments for societal welfare that sustains law and order in the population [2]. The duties of police are to maintain public peace and order, crime prevention, investigation and detection, collection of intelligence, VIP security, railway policing, protection of environmental laws etc [1]. Police have to work day and night, in order to keep the public safe and secure. They deal with an array of unique situations and stresses on habitual basis. In law enforcement, the police personnel are trained and disciplined in policing for the

longest time, however, no guidance are given to them on how to sustain and safeguard their psychological and physical wellbeing [2].

As changes in the life style made life easier and marked the beginning of certain chronic ailments such as obesity, cardiovascular disorders, endocrine disorders and osteoarthritis [3]. Cardiovascular diseases including coronary heart disease, stroke and hypertension are the leading causes of morbidity and mortality in both developed and developing countries [4]. The "Global Burden of Disease Study" has projected Coronary Artery Disease (CAD) and cerebrovascular disease as the leading causes of death worldwide by the year 2020 [5]. And police are at high risk of developing cardiovascular diseases due to work related stress where organizational factors such as work overload [6], time pressure, inadequate resources, manpower shortage, and lack of support and consultation and communication

with the higher authorities in the organization have also been identified as the potential factors responsible for the stress in the policemen [7].

And obesity has emerged as the most prevalent serious public health problem with central obesity being an independent risk factor for cardiovascular disease. According to the WHO world health statistics report 2012, globally one in six adults are obese and nearly 2.8 million individuals die each year due to overweight or obesity. Obesity can also limit activity restricting policemen to desk duty and may create a dangerous situation while on patrol as it affects swiftness of action [8].

In India, epidemiological studies have been done extensively for prevalence of diabetes and other non - communicable diseases like hypertension among the general population but data on specific occupational groups are limited [9]. The policing stage is a very important biophysical social process in which an inadequate diet may affect the performance and intellectual capacity of individuals; this may be of special relevance to life quality in developing countries, where its habitants face adverse socioeconomic, cultural and nutritional conditions [10]. This study is a modest attempt to identify dietary habits and nutritional screening of Bangalore city police from Tygarajanagar and will help in policy making as well as implement nutrition programmed on them.

## Methodology

### Study design

**Sample Selection:** The study was carried out in Tygarajanagar police station among 60 police-staff, 46 male and 14 female between ages 25-60 years who were located in Bangalore and had associated disorders like diabetes. Did you select only those with existing diabetes or all between the given age group. Approval was obtained from the Institution, Inspector General of Police before initiating the health assessment. Consent was taken from the police staff.

**Somatic status:** Anthropometric Measurements-Height (cm) and Weight (kg) was measured using standardized techniques for all the subjects. Height was measured using a stature meter (No 26SM model), which has a precision of up to 0.1 cm. The stature meter was suspended 2 m high from the floor against a straight wall. The individual was asked to stand upright without shoes with his/her back against the vertical wall, heels together and eyes directed forward. Height measurement as appeared in the read off area was then recorded [11]. Weight was recorded with minimum clothing and without shoes using an adult weighing scale. Body Mass Index (BMI) was calculated using the formula (weight in kg) / (height in m<sup>2</sup>). Weight status was then classified in accordance to cut off values for BMI given by World Health Organization (WHO) (1998) and Asia Pacific classification [12,13].

Blood sugars were checked using a glucometer and the Capillary Blood Glucose (CBG) was recorded. The Blood Pressure (BP) was measured using standard mercury sphygmomanometer and stethoscope by auscultatory method of appropriate cuff size, after 5 minutes of rest with subjects in sitting position, feet relaxed on floor and arm supported at chest level. Second reading at a 30 minute

interval was recorded, if a high BP ( $\geq 140/90$  mm Hg) was noted. The lowest of the readings was taken as BP. A person was considered as suffering from hypertension if Systolic Blood Pressure (SBP) was 140 mm Hg or above and/or Diastolic Blood Pressure (DBP) 90 mm Hg and above or is already under treatment for hypertension [14,15]. The subjects were classified as Normal, Pre-hypertensive or Hypertensive according to JNC VII criteria [16,17].

### Personal history

A preformed questionnaire was used to record their personal history adopting the direct personal interview method. Dietary intake was assessed by interviewing in detail regarding type of food consumed, regular meal timings, number of meals per day, skipping of meals, food consumption frequency and frequency consumption of junk foods, processed food, ready to eat food, sugar and salt were taken. Physical activity pattern, smoking and alcohol consumption was recorded. Blood pressure was noted and random blood sugar samples were collected.

### Interpretation and analysis of data

Keeping the objectives in mind, the data collected was compiled tabulated for the appropriateness of analysis. The data was statistically analyzed using univariate and multivariate analysis. 'P' value of less than 0.05 was considered as statistically significant. Results were then interpreted; appropriate conclusions were drawn.

## Objectives

1. To assess the nutritional status of policemen by anthropometric measurements.
2. To assess the dietary habits by food frequency consumption and food habits.
3. To determine the prevalence of obesity among policemen.
4. Association between age and BMI among police staff.
5. Prevalence of hypertension among policemen.

## Results

A questionnaire was designed based on the needs of the study. General information regarding age, marital status, anthropometric measurements, dietary pattern and health indicators like blood sugars, blood pressure and activity pattern was collected from the selected subjects adopting direct personal interview method. The study sample considered 60 subjects with 46 male police and 14 female police and the age distribution was highly skewed with majority (55%) falling in the age group of 30-39 years and only 20% being middle aged (>50 years) (Table 1). Most of the subjects were married and majority (90%) of them nuclear families.

Somatic status of the subjects that mean height of the subjects irrespective of their age group and gender was  $167 \pm 4.3$ . Mean body weight was higher among male compared to female (Table 2). Mean blood sugars was  $124 \pm 60.1$ .

BMI was calculated using Quetelet index based on WHO classification and mean BMI was found to be  $26 \text{ kg/m}^2 \pm 2.9$  where majority of them (50%) were falling in the category of overweight and

8% had BMI >30 kg/m<sup>2</sup> indicating obesity as shown in Figure 1A. (WHO,1998) whereas [11], Figure 1B shows categorization according to Asia pacific classification where, 60% of the total subjects were obese and among male 60% were obese comparison with female [13].

From Figure 2 self-reported morbidities showed 13% were diabetic, and 85% had no clinical symptoms. 88% did not have loss of appetite. 63% and 65% male had a habit of smoking and alcohol consumption respectively. Figure 3 reveals that 78% were non-vegetarians and most of them skipped their meals (55%) and also followed an irregular meal pattern. 75% had a sedentary lifestyle, with no exercise (Figure 4).

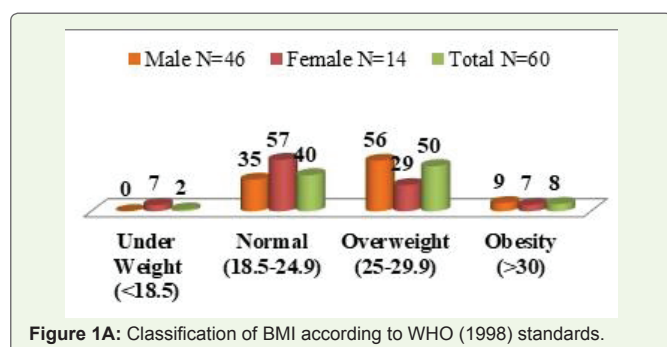
Table 3 provides the prevalence of hypertension among police staff. Only 12 % of the study subjects did not have prehypertension or hypertension, clearly indicating a major problem of pre hypertension or hypertension amongst police personnel. Noteworthy to know

**Table 1:** Background information of the subjects.

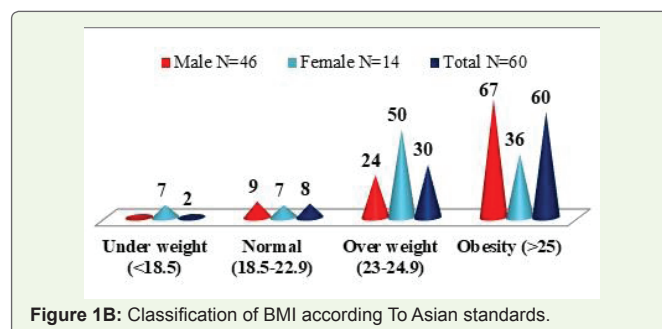
Characteristics	Male		Female		Total	
	n=46	%	n=14	%	n=60	%
<b>Age (y)</b>						
20-29	5	11	1	7	6	10
30-39	22	48	11	79	33	55
40-49	8	17	1	7	9	15
>50	11	24	1	7	12	20
<b>Marital Status</b>						
Married	31	67	12	86	43	71
Single	15	33	1	7	16	27
Widow	-	-	1	7	1	2
<b>Family Type</b>						
Nuclear	40	87	14	100	54	90
Joint	6	13	-	-	6	10

**Table 2:** Mean  $\pm$ SD anthropometric measurements, indices and health indicators of the selected subjects.

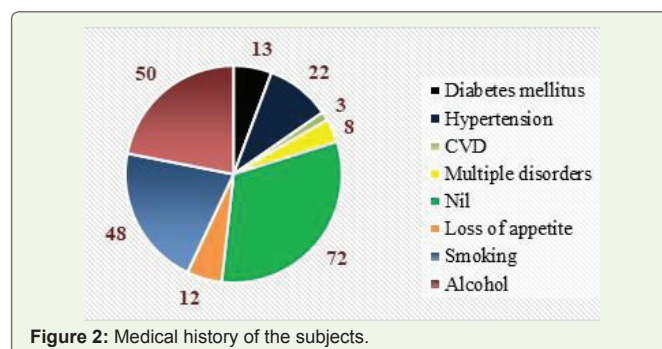
Anthropometric Measurements and Indices	Male	Female	Total
	n=46	n=14	n=60
Weight (kg)	74.6 $\pm$ 7.8	66 $\pm$ 10.5	72.6 $\pm$ 9.1
Height (cm)	168 $\pm$ 3.1	161 $\pm$ 3.1	167 $\pm$ 4.3
IBW (kg)	63.8 $\pm$ 2.4	58.4 $\pm$ 2.2	63 $\pm$ 3.2
BMI (kg/m <sup>2</sup> )	26.3 $\pm$ 2.7	25.3 $\pm$ 3.5	26 $\pm$ 2.9
Mean CBG (mg/dl)	132 $\pm$ 66	98 $\pm$ 12	124 $\pm$ 60.2
Systolic blood pressure (mm Hg)	142.3 $\pm$ 16.4	126 $\pm$ 13.2	138.4 $\pm$ 17.2
Diastolic blood pressure (mm Hg)	85 $\pm$ 19	78 $\pm$ 10.3	83 $\pm$ 18



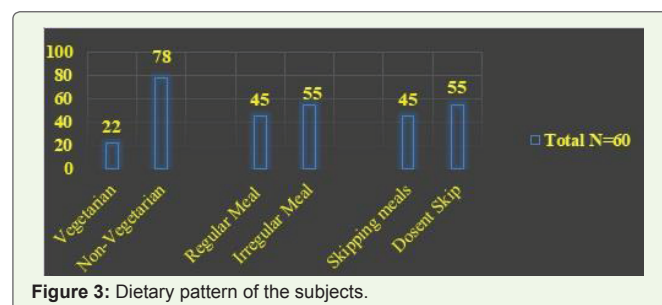
**Figure 1A:** Classification of BMI according to WHO (1998) standards.



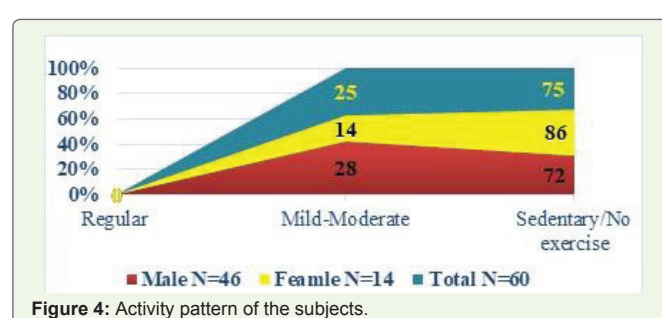
**Figure 1B:** Classification of BMI according To Asian standards.



**Figure 2:** Medical history of the subjects.



**Figure 3:** Dietary pattern of the subjects.



**Figure 4:** Activity pattern of the subjects.

**Table 3:** Prevalence of hypertension among police staff.

Variables	Male		Female		Total	
	n=46	%	n=14	%	n=60	%
<b>Known Hypertensive</b>	12	26	1	7	13	22
Normal (SBP<120 and DBP<80)	2	4.4	5	36	7	12
Pre hypertensive SBP 120-139 or DBP 80-89)	19	41.3	8	57	27	45
Hypertensive grade I SBP 140-159 or DBP 90-99)	19	41.3	1	7	20	33
Hypertensive Grade II (SBP $\geq$ 160 or DBP $\geq$ 100)	6	13	0	-	6	10



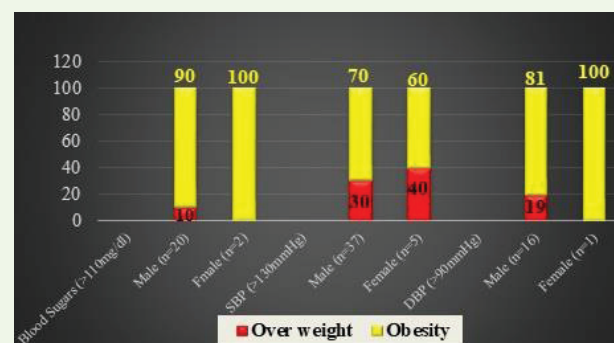
that 22% were previously diagnosed with hypertension, and were on regular antihypertensive medications. Grade 1 hypertension was reported in 33% where Systolic Blood Pressure (SBP) was 140-159 mmHg and 10% hypertension grade II (SBP- >160 mmHg). An association between age and BMI revealed that as age increased BMI increased with 16% and 53% male being over-weight and obese respectively when compared to female with 12% over-weight and 8% obese (Table 4).

When BMI was compared with the health indicators like blood sugars, 90% male and 100% female were found to be obese (Figure 5). Similarly with SBP>130 mmHg; 70% male and 60% female were lying in the category of obesity. They also had weights greater than their Ideal Body Weight (IBW). A strong association was seen between smoking, alcohol consumption and blood pressure among male police staff. Statistical analysis showed that there is an impact of smoking and alcohol consumption on hypertension where 47% and 6% were hypertensive Grade I and Grade II respectively. Among those who consumed alcohol, none of them were under the normal blood pressure range. Similarly among the individuals who did smoking, 48% and 14% were under hypertensive Grade I and Grade II respectively, which was also statistically significant (Figure 6). Life style modification with general dietary guidelines was advised to all the police staff.

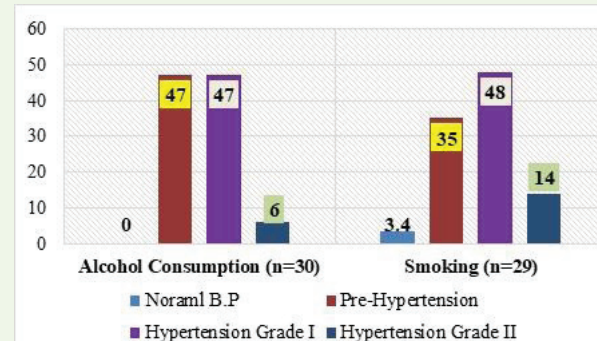
Figure 7 provides the frequency consumption of various food items among the police staff, which showed that consumption of rice (87%) and wheat (18%) were the most commonly used cereals on a daily basis, 37% used ragi twice a week but 47% never used jowar. Among the pulse group 77% of them used pulses daily and 42% were consuming whole grams once a week. Figure 8 gives information on vegetable group which was consumed in fair amounts by most of the staff, where green leafy vegetables were taken twice a week by 35% and thrice a week by 25%; whereas, other vegetables (45%) and roots and tubers (42%) were used on a daily basis. Only 17% of the group consumed fruits daily while 33% and 30% used twice and thrice a week respectively. Most of them took milk daily (92%) and curd was used by 40% regularly. As 78% of the group was non-vegetarians, 50% of them consumed eggs on a weekly basis (twice a week) similarly 48% were having either chicken or fish once a week. 20% and 30% never consumed chicken or fish and meat respectively. Salt, fats and oils showed 100% consumption. 10% never took sugar and 38% showed occasional consumption of sweets. Fast foods/outside foods or bakery products was consumed once a week by most of the police staff 35% and 45% respectively. 15% had alcohol twice a week (Figure 9).

**Table 4:** Association between age and body mass index.

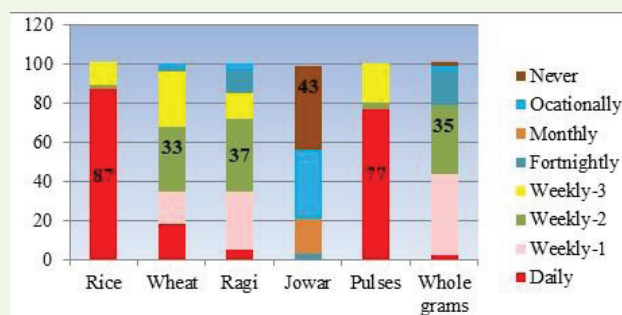
Age (y)	<18.5		18.5-22.9		23-24.9		>25	
	Male	Female	Male	Female	Male	Female	Male	Female
20-29	-	-	2	-	3	-	-	1
30-39	-	1	1	-	5	7	17	3
40-49	-	-	1	1	2	-	4	-
>50	-	-	-	-	-	-	11	1
Total no (%)	0	1 (2)	4 (7)	1 (2)	10 (16)	7 (12)	32 (53)	5 (8.3)
	1		5		17		37	



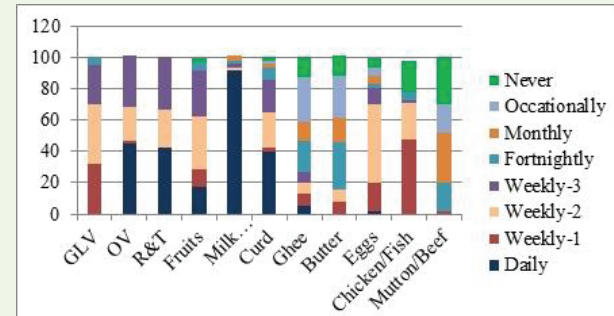
**Figure 5:** Association between health indicators and BMI of the subjects.



**Figure 6:** Impact of smoking and alcohol consumption on blood pressure. \*\* Significant at 5 % Level



**Figure 7:** Frequency consumption of cereals and pulses.



**Figure 8:** Frequency consumption of vegetables, milk products, meat and fish poultry. GLV: Green leafy Vegetables; OV: Other Vegetables; R&T: Roots and Tubers.

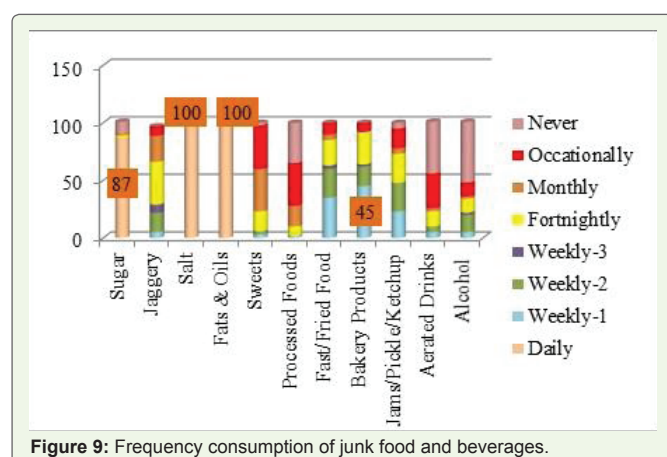


Figure 9: Frequency consumption of junk food and beverages.

## Discussion

Nutrition is the foundation of good health; health is the foundation of all happiness, skill and performance. Obesity as a health problem is becoming more widely identified. The enormous economic health cost of obesity, locates it among the most health care problems [18]. According to the WHO estimates, the undernourished population in the world has declined and is roughly around 1.2 billion, whereas the over nourished population has increased to 1.2 billion [19]. A study by Sukphal Kaur, et al. (2007), observed that where improvement in the standards of living, decrease in physical activities, dependence of men on machine, dietary changes and other life style changes have lead people putting on extra weight. In the study population, according to Asia specific classification, 30% female and 60% male were obese. This is comparable with a study by Komal Rathi, et al. (2018), in their research on assessment of weight status among police head constables in Delhi observed a noticeable prevalence of overweight and obesity among the police constables along with associated comorbidities and emphasized the need for suitable prevention strategies. A similar study by Moonmoon Hoque, et al. (2016) made an attempt to assess dietary habit and nutritional status of 100 police staff, and found that though three-fourth of the respondents were normal in terms of nutritional status but still one-fourth were overweight [10]. Another prevalence study conducted by Nadiy, et al. (2013) found that, among the Malaysian Army (MA) personnel, 32.8% were overweight and 9.3% were obese [20]. From the study group it was seen that 33% and 10% had Hypertension grade I and grade II respectively. In a similar study Ganesh K.S, et al. (2013) revealed the prevalence of pre-hypertension and hypertension was 37.8% and 34.5% respectively among male police personnel in urban Pondicherry [14]. In the present study 41.3% male were pre-hypertensive and hypertensive respectively. The results in Figure 5 indicate that 43% of male and 14% female exhibited notably elevated blood sugar levels (>110 mg/100 ml); this result was higher than the 5.7% reported by Karim, et al. (2000) for adult males in a Saudi Arabian population. Increased body weight leads to elevated blood sugar levels [21]. Another study by Alghamdi, et al. (2017) on 160 police officers in Riyadh, Saudi Arabia, found that among participants with high blood sugar levels approximately 58.3% were obese and 25% were overweight. Blood sugar levels increased with increasing BMI [22]. Policemen, to relieve from this

occupational stress tend to stick to unhealthy habits such as smoking, consumption of alcohol and smokeless tobacco, and irregular dietary pattern, and they are not habituated in leisure time physical activity [23,24]. As a result, they face many adverse effects pertaining to these habits. It was observed from the study that advancing age was significantly associated with hypertension among both male and female police staff and female staff did not have any habit of smoking or alcohol use, But 47% and 48% male who were smoking and consuming alcohol respectively where hypertensive (grade I) which is comparable with the findings of Anurupa Sen, et al. (2015) who tried to determine the prevalence of hypertension and its associated risk factors among the policemen of Kolkata, which revealed that notable numbers of Kolkata-based policemen are hypertensive (32.5%) than civilians. Age, overall obesity assessed by BMI, SBP and consumption of smokeless tobacco were the identified risk factors of hypertension among this group of emergency responders [15]. Ganesh K.S, et al. (2013) showed that the prevalence of hypertension was 34.5% and associated risk factors were overweight and obesity (54.4%), smoking (21.6%), alcohol use (50.3%) [14]. Alcohol consumption may influence the higher prevalence of risk factors for IHD in police officers. Potential mechanisms for this relationship include a direct pressor effect of alcohol on the vessel wall, sensitization of resistance vessels to pressor substances, stimulation of the sympathetic nervous system and increased production of adrenocorticoid hormones [25]. Another study on police showed that cardiovascular risk among police personnel is higher compared to general population in India. This is because police had higher prevalence of cardio metabolic abnormalities and diabetes in comparison to general population [26].

## Conclusion

The study revealed that overweight and obesity was prevalent as indicated by BMI among the police staff. It also gives valuable information regarding the present magnitude of hypertension and certain risk factors among this vulnerable group. Healthy food and physical activity provides protection from the health risks of obesity. Risk factor such as obesity, smoking, and alcoholism also needs attention in this occupational group. Preventive and remedial plans should be developed to protect these officers from obesity and associated complications.

## Recommendation

Since the study aimed at providing baseline nutritional screening, dietary habits and prevalence of hypertension among police personal, the complete lifestyle patterns were not assessed and further in-depth research is recommended to study the other associated lifestyle and environmental factors. Not much has been done to determine the health status of the policemen in Bangalore city and indicate preventive measures for their upliftment of health. Further studies involving more police stations across Bangalore city is required to access the nutritional status of policemen. Without their competent services, it is next to impossible to keep the city functioning smoothly. Lifestyle modifications and a regular fitness program targeted at specific groups such as police personnel who are vulnerable to non-communicable diseases is essential to prevent escalation of such diseases and maintain good health.

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