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Systematic Review

Hypertension and diabetes mellitus: a systematic review of the distribution, prevalence and its associated factors among police officers and security agents

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ABSTRACT

Security agents and emergency responders are significant in ensuring the safety and security which lie at the heart of the prosperity of any nation, the relevance of exploring the prevalence of hypertension and diabetes mellitus among these populations, especially police officers increase progressively due to the growth. In this review, it had been described that there was a high prevalence of hypertension and diabetes mellitus among police officers and other emergency responders, and their associated factors were equally explored. A total of 23 most relevant articles was included, which followed the preferred reporting for systematic review and meta-analysis (PRISMA) guidelines. The general concepts and topics enclosed by PRISMA were all relevant to any systematic review, a fast systematic review of all articles published between 2013 and 2022 employing databases such as PubMed, Google scholar and other online databases was conducted. Included research covered studies involving hypertension, diabetes mellitus and its associated factors among emergency responders. 19,377 studies were collected and 23 articles satisfied the inclusion criteria, incusing cross-sectional studies, cohort studies and longitudinal, descriptive and quantitative observational studies. Studies show that prevalence was high for both variables and age, being a male, rest, body mass index (BMI), smoking and alcohol consumption were the significant associated factors among these working groups. Regular health screening and encouragement of healthy lifestyles are recommended.

Keywords: Prevalence, Hypertension, Diabetes mellitus, Police officers, Security agents

INTRODUCTION

Hypertension

Hypertension (HTN) which is also known as a silent killer is the most prevalent and most important cause of brain stroke, cardiovascular disease and heart and renal failures, it is a public health problem worldwide. Globally it is estimated that 26% of the world population has HTN and the prevalence is expected to rise to 29%, it is the main risk factor for morbidity and mortality in the world. HTN is classified into essential (primary) or secondary HTN based on aetiology. Primary or essential HTN is the most common type, affecting 90-95% of hypertensive patients. It is defined as a rise in blood pressure of unknown origin (idiopathic). Secondary HTN is the increase in blood pressure caused by diseases.[1,2]

Hypertension is known to be responsible for 54% and 45% of deaths caused by brain stroke and cardiovascular diseases respectively. In Africa high systolic blood pressure is the leading risk for death in Africa. It resulted in nearly 900,000 deaths (10% of the total deaths on the continent) in 2016 and has increased by 82% since 1990. It is also responsible for more than half of first-time acute strokes in Africa. It is also a potentially modifiable risk

factor for dementia, a disease of concern in Africa where ageing, stroke and other cardiovascular diseases are rising.[3,4] Several systematic analyses of HTN in adults and adolescents in Africa have recently been conducted.[5] The estimated pooled prevalence of HTN is about 27% in Africa and 30.0-31.1% in Sub-Saharan Africa. HTN is now a significant problem in groups previously thought to be at low risks such as rural populations, poor households, young people and security agencies. It is a common cause of medical admissions in African hospitals.[6,7] With the ageing population, the rising urbanization and the attendant stress, westernized diet and low physical activity, high blood pressure will likely continue to rise.[8]

A study done in Nigeria had shown that there was an increase in HTN cases, it was reported that between 1995 and 2020 there had been a 540% increase in HTN cases, and the number of HTN cases increased from 4.3 million in 1995 to 27.5 million in 2020. The prevalence of HTN in Nigeria was 30.6%.[9] While another study conducted in India corresponded with the findings on the prevalence and risk factors of HTN but among male police personnel. High blood pressure according to the ACCA and the American Heart Association can be classified as normal if the blood pressure is equal to or less than 120/80 mmHg and elevated if it is greater than 120/80 mmHg. Stage 1 HTN is when the blood pressure is between 130-139/80-89 mmHg, stage 2 HTN is when the blood pressure is at least 140/90 mmHg and hypertensive crises are when the blood pressure is greater than or equal to 180/120mmHg.[2]

Study had shown that the prevalence was relatively high.[10] A study also reported that abdominal obesity is a risk factor for HTN among police officers however, a Nigerian study reported otherwise, that there was no relationship between obesity and HTN among police officers but attributed it to stress related to their job and positive family history.[11] Age is also a risk factor among police officers as the prevalence of HTN was reported to be higher among older senior police officers compared to younger junior police officers. It should, however, be noted that this relationship, however, existed irrespective of occupation.[2,12] Several factors put people at risk of developing HTN this can be either modifiable or non-modifiable risk factors. Gender, age, race, and heredity are risk factors that cannot be modified. Modifiable risk factors include lifestyle-related factors such as obesity, diet, physical inactivity, stress, the use of certain medications, smoking, excessive alcohol consumption and excessive salt intake. It could also be pathologic such as DM and dyslipidaemias.[13] Food pattern, overweight or obesity has also been shown to be contributing factors.[14]

Diabetes

Diabetes is a chronic non-communicable disease characterized by chronic hyperglycaemia from absolute or relative insulin deficiency or defective action of insulin or both, resulting in the disorder of carbohydrate, protein and fat metabolism. An individual is classified as diabetic if the random blood sugar level is 200 milligrams per decilitre (mg/dl) or higher or 11.1 millimoles per litre (mmol/l) or higher. A fasting blood sugar level of 100 mg/dl (5.6 mmol/l) is normal. A fasting blood sugar level from 100-125 mg/dl (5.6 to 6.9 mmol/l) is considered prediabetes, if it is 126 mg/l (7 mmol/l) or higher on two separate tests it is termed DM (DM). An oral glucose tolerance test of less than 140 mg/dl (7.8 mmol/l) is normal. A reading of more than 200 mg/dl (11.1 mmol/l) after two hours indicates diabetes. A reading between 140 and 199 mg/dl (7.8 mmol/l and 11.0 mmol/l) indicates prediabetes, a non-Nigerian study reported a relatively high prevalence among recruits.[15]

According to the International Diabetes Federation (IDF), 463 million people were affected by diabetes worldwide also according to the International Diabetes Federation Africa region it was estimated that 19 million adults between the ages of 20-79 had DM.[16] It was also estimated that 19 million adults between the ages of 20-79 had DM.[16] Nigeria had a 3.1% prevalence of DM.[17] A study reported that. The prevalence of diabetes for all age groups worldwide was estimated to be 2.8% in 2000 and 4.4% in 2030. The total number of people with diabetes is projected to rise from 171 million in 2000 to 366 million in 2030.[18]

Studies have been done worldwide on the prevalence of HTN and diabetes among security agencies like police officers, study done in Mumbai India reported that the prevalence of HTN among police officers was 26.66% and diabetes was also 26.66% which was higher than the general population which was 6.66 and 5.33% respectively, the determinant of the increase in HTN and diabetes among police officers was tobacco chewing and alcohol consumption.[19-21]

A comparative study between police officers and other armed forces in India reported that police officers had a higher prevalence of diabetes and HTN compared to other armed forces, police officers had a prevalence of HTN of 9.58% compared to other armed forces which were 9.15% and diabetes was greater than 30% among police officers compared to other armed forces which were 9.30%. The increase in diabetes among police officers as compared to other armed forces was due to overweight and obesity and the increase in HTN was attributed to increased stress among police officers.[22]

Another comparative study done in India between police officers and the general population on the prevalence of HTN among police officers reported that police officers had a higher prevalence of HTN and diabetes which was 52% and 36.4% compared to the general population which was 22.5% and 19.6% respectively, this increase in the prevalence of diabetes and HTN among police officers was attributed to smoking, tobacco and alcohol consumption.[23]

Another study done on the prevalence and determinants of HTN and DM among the general population compared to police officers reported an increase in the prevalence of HTN and diabetes with the prevalence of 58.5% and 32.1% compared to the general population which was 29.2% and 20.2%, the determinants of the high blood pressure and DM among police officers was attributed to lack of physical activity, addiction to alcohol and smoking.[24]

Some other studies attributed the high prevalence of HTN among police officers to stress from continuous confrontation with lawbreakers rotating work schedules and obligation to maintain high standards of service in different changing labour contexts.[25,26]

Studies have also been conducted among police officers in Africa, a Ghanaian reported that the prevalence of diabetes and HTN was 1.7% and 25.8% respectively and the associated factors were overweight and dyslipidaemia, this was attributed to reduced physical activity and reduced intake of fruits and vegetables and other fibre rich foods. Another study showed a relationship between stress and diabetes among police officers.[27] Similarly, an African study reported that obesity was a risk factor for DM among police officers and that senior officers had a higher prevalence of DM compared to junior police officers because of a lack of physical activity as they spend more time in their offices as senior officers this results to obesity among them which is a risk factor of DM.[28] Another study attributed physical inactivity, obesity, excessive alcohol consumption, smoking, positive family history of DM and HTN and unhealthy diets as major risk factors for DM among police officers. Among police officers, studies have shown that the factors responsible for both HTN and DM include stress, being overweight, dyslipidaemia, improper dietary habits, physical inactivity and long work hours.[29,30]

METHODS

A review of the literature published on the prevalence of HTN and DM among police officers and other security agents in English was conducted. This systematic review followed the PRISMA guidelines since the general concepts and topics covered by PRISMA were all relevant to any systematic review. For the specific objective of the systematic review reported by in this article, the following research questions were considered; what is the prevalence of HTN? The prevalence of DM? How are they distributed among these agents? and what are their associated factors?

Searching of online databases and the world wide web, as well as hand searching of the west medical journal, PubMed, millennium and Google scholar, was conducted. Papers on research done on factors associated with HTN and DM among police officers, emergency agents and civilian population which were published from 2013 to 2022 were included in the research referenced while studies among police officers, emergency responders and security agents were reviewed. For additional information, we also searched the websites of WHO, the American College of Cardiology, JNC8, the IDF, National Diabetes Statistics and Diabetes Reports and the American Diabetes Association. Two reviewers (1st and 2nd authors) examined the literature employing a priori prioritisation and consecutive sifting approaches to ensure the information's quality and correctness. a third reviewer (the third author) weighed in to resolve issues where there were disagreements between the two reviewers,

The following inclusion criteria were used in the study: referenced thesis, local or international journals or peer-reviewed journals, full-text articles available through an indexed in an international scientific journal, referenced past research must contain information on the prevalence of HTN or DM or factors associated with DM and HTN among police officers or security agents.

RESULTS

This systematic review followed the guidelines of the PRISMA and Figure 1 shows the flowchart of the study selection for the systematic review. Using the customized search with the range of 2013 to 2022, a total of 19,377 articles were obtained on PubMed, Google Scholar and other online databases, published article identified and screened after removing duplication from all database was 1597, the records excluded at the final screening level was 1495 leaving 102 articles for eligibility assessment, with reasons, 78 articles were excluded and 23 articles were included in the synthesis. The reasons for excluding these articles included: they were not specifically related to HTN or DM; they were related but did not consider the police officers, security agents or emergency responders.

Table 1 shows the characteristics of all 23 relevant studies from different countries conducted among police officers and security agents and emergency responders, all studies utilized different tools for sample and data collection. Notably, all studies were conducted between 2014 and 2022, there were 18 cross-sectional studies, three prospective cohort studies, a case-control study and one longitudinal, descriptive and quantitative observational study. The sample size of the included studies ranged from 92 to 10,348 and a total of 28,054.

In this study, all studies included have been conducted in random countries on the prevalence of hypertension or diabetes mellitus or its associated factors among police officers, military personnel and other security agents. Although it was established that security agents including police officers have at least fair knowledge of HTN and DM.[31] HTN and DM were still high among these working groups.[20,26,32-35] A significantly higher prevalence (32.5%) of hypertension was observed among police officers compared to other civilians in India.[20] In Africa, high blood pressure was discovered in 68.82% of soldiers in

Conakry, Guinea.[36] In Nigeria HTN was prevalent among police officers.[37,38]

The diabetes prevalence was generally high among police officers and emergency responders.[15,21] The prevalence of type diabetes among military personnel was 9.15% and 5.35% among police officers, while the prevalence of prediabetes was 7.32% and 6.35% for military personnel and police officers respectively as reported by a review study conducted among forces.[22] The prevalence of both HTN and DM had been shown to be high in male officers than in females.[30,39-42] Among African populations, a prevalence of 4.1% and 6.5% for diabetes and prediabetes were found among police officers in Guinea-Bissau.[19]

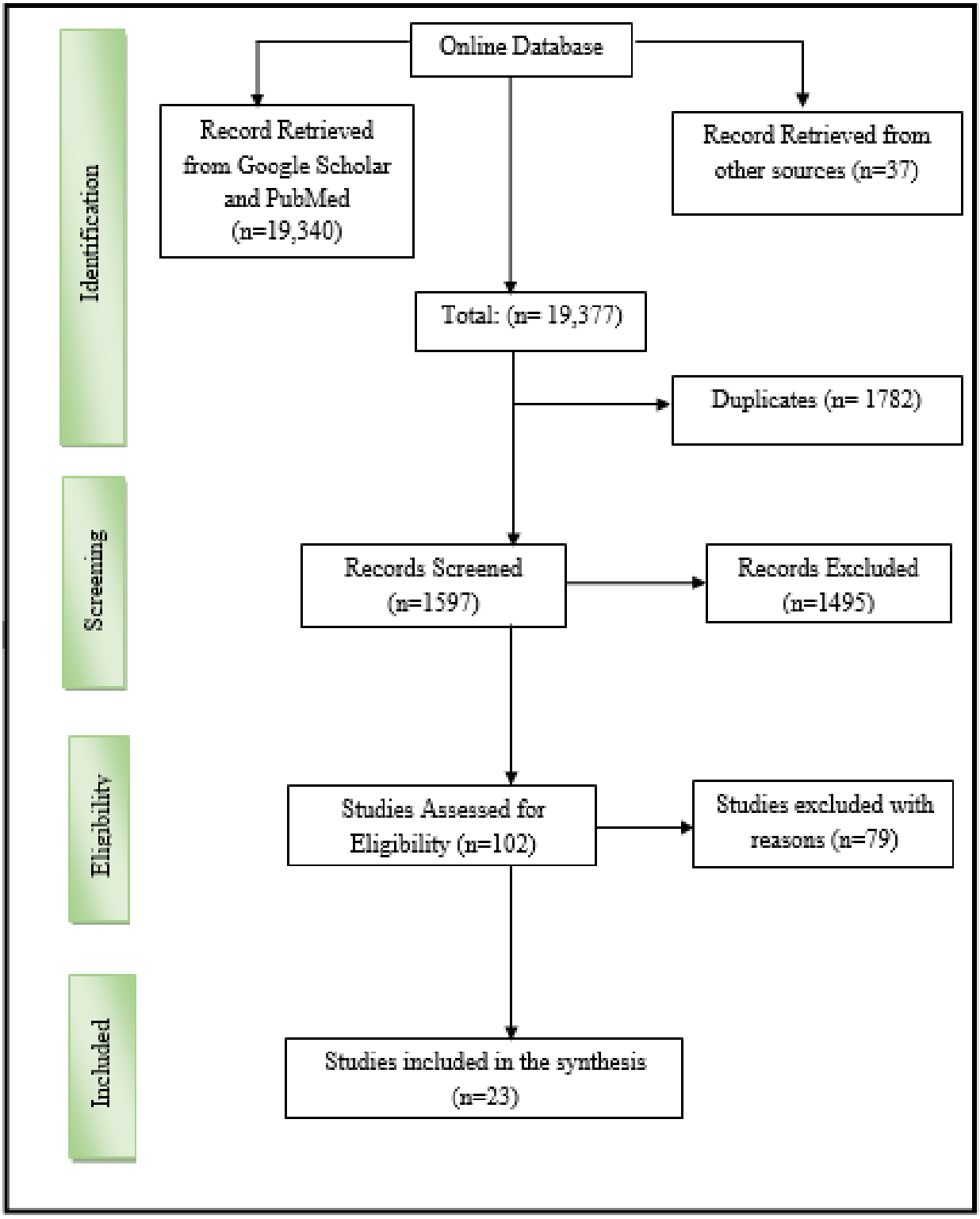

Figure 1: PRISMA Flow diagram showing the selection of the systematic review.

Table 1: Characteristics of the studies selected for the systematic review.

S. no.	Author(s) (year)	Objectives	Methodology and sample size	Instruments	Findings
1.	Ajah et al 2018[37]	Investigates the relationship between BMI and hypertension among police officers in Port Harcourt	Cross-sectional study design 245	Questionnaire	The result showed the BMI of the males increased with age in contrast to the females hypertension was prevalent among the major groups, with the prevalence of hypertension higher among obese officers (22.90%) in comparison with non-obese hypertensive (17.55%) and non-hypertensive obese (15.90%) in both male and female police
2.	Sen et al 2015[20]	To determine the prevalence of hypertension and its associated risk factors among the policemen of a metropolitan city, Kolkata, West Bengal, India	A cross-sectional study among 916 policemen	Questionnaire	The prevalence of hypertension [systolic blood pressure (SBP) X 140 mm Hg, diastolic blood pressure X 90 mm Hg, or use of antihypertensive drugs] was observed among 32.5% of policemen, which was significantly higher when compared with the civilians (P= 0.01), Regression analysis identified age, body mass index (BMI), SBP, history of parental hypertension, and consumption of smokeless tobacco as the risk factors of hypertension.
3.	Bah et al 2016[36]	The objective of this study is to determine the prevalence of hypertension in military garrisons in Conakry, the capital	A prospective and cross-sectional study 1025	Questionnaire entry and clinical Screening	High BP cases were discovered in 155 soldiers (69.82%) in random observations
4.	Douglas et al 2015[32]	to determine the prevalence of hypertension among firemen in Rivers state, South-South Nigeria.	Cross-sectional 125	Questionnaire	There was a 9.6% prevalence of hypertension among this group of workers in Rivers State
5.	Elliott et al 2016[40]	This study sought to determine changes in BP and associations with the overall sleep quality and fatigue in 206 general duties police officer	cross-sectional study 206	Lifestyle Appraisal Questionnaire	Although there was no change in BP for male participants, female officers' systolic blood pressure (SBP) was found to increase significantly across the shift ($p < 0.001$), but no

Continued.

S. no.	Author(s) (year)	Objectives	Methodology and sample size	Instruments	Findings
					change was found in females' diastolic blood pressure (DBP)
6.	Fathalipour et al 2020[22]	To estimate the prevalence of type 2 diabetes and prediabetes among military personnel and police officers	carried out a systematic search of electronic databases from January 2000 to July 2020. All studies with a report of the prevalence of diabetes and/or prediabetes among armed forces personnel were selected	The Cochran test and I2 statistics were used to determine the heterogeneity of the studies	The meta-analysis estimated the prevalence of type 2 diabetes among military personnel (9.15%; 95% confidence intervals [CI]: 5.35-12.96) and police officers (9.58%; CI: 5.98-13.18). The overall prevalence of prediabetes among military personnel and police officers was 7.32% (CI: 4.22-10.42) and 6.35% (CI: 5.26-7.44), respectively.
7.	Febyan et al 2020[39]	To describe the clinical profile of metabolic syndrome among police officer	A cross-sectional study	The data was obtained by anamnesis, a physical examination from anthropometric measurements and blood pressure, and laboratory findings	The prevalence of metabolic syndrome among police officers was high, especially in male
8.	Fikenzer et al 2014[30]	to determine the prevalence of arterial hypertension as well as the evaluation of individual risk factors contributing to arterial hypertension in young police officers.	Cross-sectional study 534	standardized questionnaire	The prevalence was 16.0% in males and 11.6% in females.
9.	Ganesh et al 2014[41]	To assess the prevalence and risk factors of hypertension among male police personnel in urban Puducherry India.	Cross-Sectional 296	Questionnaire	The prevalence of pre-hypertension and hypertension was 37.8% and 34.5% respectively. Among those with hypertension, 56.86% (58/102) were known hypertensive and 43.13% (44/102) were newly diagnosed. Age
10.	Guillermo et al 2019[42]	To assess the Incidence of hypertension in a high-risk workgroup (Police officers)	A longitudinal, descriptive and quantitative observational study. 550	Questionnaire	The majority (92%) of the hypertensive population belongs to the male sex, while 8% of the female population. 57% of the total population were classified as

Continued.

S. no.	Author(s) (year)	Objectives	Methodology and sample size	Instruments	Findings
					normotensive, while 21% were classified as High Normal, Grade I Hypertension, and Grade II Hypertension.
11.	Jeoma et al 2022[38]	To examine sociodemographic characteristics as a predictor of high blood pressure among police officers in Rivers State's Obio/Akpor Local Government Area	Cross-sectional study design Among 300 Police officers	Questionnaire	there was around a 180 (60.6 per cent) prevalence of hypertension among police officers in Rivers State's Obio/Akpor Local Government Area
12.	Lan et al 2020[7]	Examine the association between healthy Mediterranean lifestyle practices and cardiovascular disease (CVD) risk factors among New England firefighter recruits.	Cross-sectional 92	A MEDI-Lifestyle score was used to measure adherence to a Mediterranean lifestyle	Among 92 recruits, high adherence to MEDI-Lifestyle was significantly associated with a decreased risk of prevalent hypertension
13.	Li et al 2017[45]	investigated whether psychological distress predicts the development of type 2 diabetes mellitus (T2DM) and if the association differs between populations at a high or low diabetes risk level among Chinese police officers.	Prospective cohort study 6559	questionnaire and a self-designed questionnaire	179 subjects developed NOD during the 4-year follow-up. 54 subjects (1.63%) with an HKCDRS 0–7 vs 125 subjects (4.98%) with an HKCDRS>7 developed NOD ($p<0.05$)
14.	Lindman et al 2017[19]	To investigate the Diabetes and pre-diabetes among police officers in Guinea-Bissau	Cross-sectional 1119	Those with a random blood glucose (RBG) >8.0 mol/l had HbA1c (glycated haemoglobin) testing	Diabetes (HbA1c >6.5%) was present in 4.1%, and pre-diabetes (HbA1c 5.7–6.5%) was present in a further 4.2%. Factors associated with diabetes were age, weight and ethnicity. Introduction
15.	Mahesh et al 2019[26]	the prevalence of hypertension and associated risk factors with a reference to perceived stress from Dec 15 to Dec 17 in a metro city in central India.	a cross-sectional study was conducted among 340 police personnel for	Questionnaire	The prevalence of hypertension in the study group was 37.6% (128 out of 340 participants) and perceived stress scale – 10 reported 43% of participants had surprisingly reported low stress, followed by average stress (38%) among the study population.
16.	Malik et al 2014[11]	assess the prevalence of hypertension,	Cross-sectional	Questionnaire	Prevalence of hypertension and mean

Continued.

S. no.	Author(s) (year)	Objectives	Methodology and sample size	Instruments	Findings
		prehypertension, normotension and the associated factors along with awareness, treatment and control of hypertension among police personnel in Bankura	1817		BP increases with age. Cardiovascular risk factors show clustering in higher age and hypertension
17.	Meerasa et al 2022[44]	To investigate the Weighing in on Type 2 Diabetes in the Military	A case-control study	4-to-1 matched for age, sex, entry date, time in service, and service component (e.g., Army, Navy), was used to describe the association of race/ethnicity, socioeconomic status, and BMI and blood pressure at entry into military service with the subsequent development of type 2 diabetes	Increased BMI (adjusted odds ratio, 3.0 for the 30 kg/m2 vs. 20 kg/m2 categories and 2.0 for the 25.0–29.9 kg/m2 category, compared with the reference category), African-American (adjusted odds ratio, 2.0) and Hispanic origin (adjusted odds ratio, 1.6) compared with white race and rank (adjusted odds ratio for junior enlisted versus officers, 4.1) were all associated with type 2 diabetes
18.	Hussain et al 2020[31]	To address the knowledge gap on the prevalence of hypertension among police officers in Ibadan, Nigeria.	Cross-sectional study 170	Questionnaire	The majority (47.6%) had a fair knowledge of hypertension. The prevalence of abdominal obesity and hypertension were 51.7% and 17.5% respectively. About a tenth (11.4%) were both hypertensive and obese.
19.	Parkash et al 2019[34]	Prevalence of Hypertension and its Determinants among Policemen in the City of Haryana	A cross-sectional study 450	predesigned, pretested, semi-structured interview schedule	(36.4%) participants were found to be hypertensive
20.	Afifi et al 2017[15]	To Measure and analyse the prevalence and risks of prediabetes and diabetes among recruits enlisted in the Wadi Al-Dawasir (WD) military zone, central Saudi Arabia.	Cross-Sectional Study Design 531	Questionnaire	subjects had RPG ≥200mg%: 23 (4.3%) known diabetic (uncontrolled) and 6 (1.3%) undiagnosed (pre-diabetes). Known diabetics tended to record higher RPG values than non-diabetics (U 3515, $p < 0.0001$).
21.	Shaidah 2016[35]	To determine the prevalence of hypertension and its risk	Cross-sectional 191	self-administered questionnaire	Prevalence of hypertension and prehypertension were 45

Continued.

S. no.	Author(s) (year)	Objectives	Methodology and sample size	Instruments	Findings
		factors among security officers of the University of Ghana			% and 37 % respectively
22.	Tariku et al 2016[21]	to assess the prevalence and factors associated with diabetes mellitus and impaired fasting glucose levels among members of the federal police commission residing in Addis Ababa, Ethiopia	A cross-sectional study design 936	The data were collected using a structured questionnaire, physical examinations and blood samples	The prevalence of overall impaired glucose homeostasis (IGH) was 120 (13%) of which 47 (5%) were diabetes and 73 (8%) were impaired fasting glucose
23.	Zhang et al 2019[43]	to assess the prevalence of metabolic syndrome (MS) and its risk factors among police officers in a large city in China.	A cross-sectional study was conducted among 10,348 police officers in	Questionnaire	The prevalence of MS was 23.2% (95% confidence interval [CI]: 22.2%–24.2%). The main risk factors associated with MS were older age, being male and alcohol consumption.

HTN and DM associated factors

The reported associated factors related to HTN and diabetes include age, family history, alcohol consumption and obesity among others.[7,11,20,37,41,43] Parental HTN, BMI, age, alcohol consumption and smokeless tobacco were identified risk factors for HTN among policemen in Kolkata India.[20] In Africa, a Nigerian study showed that the BMI of the males increased with age in contrast to females and that hypertension was more prevalent among the obese officers (22.9%) compared with non-obese and 9.6% prevalence of hypertension was reported among firemen in another state of the country while a Guinea-Bissau study identified ethnicity as an associated factor with diabetes mellitus and increased BMI was also found to be an associated factor with type 2 diabetes for most races including, African-American, Hispanic compared with white race and that both junior and senior officers are all associated.[19,32,37,44]

In addition, similarly, a follow-up study to investigate whether psychological distress predicts the development of type 2 diabetes mellitus (T2DM) and if the association differs between populations at a high or low diabetes risk level among Chinese police officers reported that 179 subjects developed NOD during the 4-year follow-up. 54 subjects (1.63%) with an HKCDRS 0-7 vs. 125 subjects (4.98%) with an HKCDRS >7 developed NOD ($p<0.05$) and concluded that psychological distress was an independent risk factor for T2DM which agreed with another study on HTN that assessed the prevalence of hypertension and associated risk factors with a reference to perceived stress.[26,45]

DISCUSSION

This review study revealed that the prevalence of HTN and DM was high among security agents and emergency respondents especially among police officers, although the men in different forces and security agents were shown to have averagely-fair knowledge of hypertension, and diabetes mellitus, the prevalence was still found to be high, this could mean that the difference intervention cardiovascular diseases and metabolic syndrome-related diseases were impactful among the forces, but the higher prevalence made their lifestyle questionable especially the modifiable lifestyles since adherence to a healthy lifestyle was proven to be significantly associated with the reduction in the prevalence of both hypertension and DM.[7] They wee also commoner among males than females, regardless of the rank of the officers or year of service, and in all races although higher in others races in the military forces compared to whites, which was also in constant agreement that there was higher prevalence among police officers, forces and other security agents.

Factors associated with HTN and DM among forces and police officers are age, BMI, family history, alcohol and smokeless tobacco consumption, and modifiable risk factors generally, however, compared to other workforce or civil servants, other associated factors among police officers include; being a male, rest (sleep), obesity, alcohol consumption. There seem to be more prominent among officers compared to other workforce and are significantly associated with hypertension and diabetes mellitus among them.

Limitation

Due to the death of data on studies conducted among police officers and other emergency responders, the review could not be based on a specific country but included distinctively, studies carried out among these emergency responders.

CONCLUSION

It is possible to conclude that there is a high prevalence of HTN and DM among police officers and other emergency responders in most countries including Nigeria, it is more common among male officers than females and more prevalent among the security working groups than other civil servants and the general population. The associated factors include BMI, obesity, smoking and alcohol consumption, being a male, family history of diabetes or hypertension and rest.

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REFERENCES

1. Unger T, Borghi C, Charchar F, Khan NA, Poulter NR, Prabhakaran D, et al. International Society of Hypertension global hypertension practice guidelines. Hypertension. 2020;75(6):1334-57.
2. Medscape. Fact sheet: Hypertension: practice essentials, background, pathophysiology. Medscape. Available at: https://emedicine.medscape.com/article/1937383-overview. Accessed on 20 December 2022.
3. Akinyemi R, Owolabi M, Ihara M, Damasceno A, Ogunniyi A, Dotchin C. Stroke, cerebrovascular diseases and vascular cognitive impairment in Africa. Brain Res Bull. 2018;2(145):97-108.
4. Livingston G, Sommerlad A, Orgeta V, Costafreda S, Huntley J, Ames D. Dementia prevention, intervention, and care. Lancet. 2017;17(390):31363-6.
5. Ndabarora E, Nishimwe C. Systematic review of hypertension prevalence and awareness in Sub-Saharan Africa. Kibogora Polytech Sci J. 2018;1(1):11-4.
6. Awuah R, Anarfi J, Agyemang C, Ogedegbe G, Aikins AG. Prevalence, awareness, treatment and control of hypertension in urban poor communities in Accra, Ghana. J Hypertens. 2014;32(6):1203-10.
7. Lan FY, Fernandez-Montero A, Yiannakou I. A Mediterranean lifestyle is associated with lower hypertension prevalence and better aerobic capacity among New England firefighter recruits. J Occup Environ Med. 2020;62(7):466-71.
8. Zhou B, Bentham J, Di Cesare M. Worldwide trends in blood pressure from 1975 to 2015: a pooled analysis of 1479 population-based measurement studies with 19 1 million participants. Lancet. 2017;389(10064):37-55.
9. Adeloye D, Owolabi EO, Ojji DB, Auta A, Dewan MT, Olanrewaju TO, et al. Prevalence, awareness, treatment, and control of hypertension in Nigeria in 1995 and 2020: a systematic analysis of current evidence. J Clin Hypertens. 2021;23(5):963-77.
10. Tesfa E. Prevalence of and risk factors for hypertension in Ethiopia: a systematic review and meta-analysis. Heal Sci Reports. 2021:1-17.
11. Mallik D, Mukhopadhyay DK, Kumar P, Sinhababu A. Hypertension, prehypertension and normotension among police personnel in a district of West Bengal, India. J Assoc Physicians India. 2014;62:12-6.
12. Gajendra SM. Impact of hypertension on quality of life among people living in an urban area of Delhi, India. J Hpertension. 2016;34(9):462.
13. Ngakieb FM, Natuhoyila AN, Bompeka FL, Bayauli P, Lubenga Y, Munsi BK, et al. Prevalence and associated factors of hypertension among adults living in the city of Bandundu, Republic Democratic Republic of the Congo: a population-based cross-sectional study. Open Access Libr J. 2021;8(4):9.
14. Woldesemayat EM. Undiagnosed hypertension and associated factors among adults in Hawela Tula Sub-City, Hawassa, Southern Ethiopia : a community-based cross-sectional study. Dove Press. 2020;13:2169-77.
15. Afifi RM, Saad AE, Shehri AA. Prevalence and correlates of prediabetes and diabetes results-I : a screening plan in a selected military community in Central Saudi Arabia. J Diabetes Mellit. 2017;46(5):12-30.
16. International Diabetes Federation (IDF). Diabetes in the IDF Africa Region. Diabetes in Africa. Available at: https://idf.org/our-network/regions-members/africa/welcome.html. Accessed on 20 December 2022.
17. International Diabetes Federation (IDF). Nigeria Diabetes report 2010-2045. Available at: https://diabetesatlas.org/data/en/country/145/ng.html Accessed on 20 December 2022.
18. Wild S, Roglic G, Green A. Estimates for the year 2000 and projections for 2030. Epidemiol Serv Res. 2004;27(5).
19. 1Lindman J, Ström K, Biague A. Diabetes and pre-diabetes among police officers in Guinea-Bissau. African J Diabetes Med. 2017;25(2):19-20.
20. Sen A, Das M, Basu S, DattaG. Prevalence of hypertension and its associated risk factors among Kolkata-based policemen: a sociophysiological study. Int J Med Sci Public Heal. 2015;4(2):225.

21. Tesfaye T, Shikur B, Shimels T, Firdu N. Prevalence and factors associated with diabetes mellitus and impaired fasting glucose level among members of federal police commission residing in Addis Ababa, Ethiopia. BMC Endocr Disord. 2016;16(1):1-9.
22. Fathalipour MM, Hassanipour S, Sepandi M, Taghdir M, Abbaszadeh S. The prevalence of type 2 diabetes and prediabetes among armed forces personnel: a systematic review and meta-analysis. Res Sq. 2020:1-12.
23. Walsh CM, Hilas O, Ezzo DC. Metabolic syndrome and cardiovascular risk factors. US Pharm. 2009;34(2):4-6.
24. Tharkar S, Kumpatla S, Muthukumaran P, Viswanathan V. High prevalence of metabolic syndrome and cardiovascular risk among police personnel compared to the general population in India. J Assoc Physicians India. 2008;6((11)):845-9.
25. Tomei F, Rosati M, Baccolo T, Cherubini E, Ciarroca M. Ambulatory (24 hours) blood pressure monitoring in Police officers. J Occup Heal. 2004:46235-43.
26. Mahesh P, Mohan J. Hypertension among police personnel with reference to perceived stress: a cross sectional study. Occup Med Heal Aff. 2019;7(2):2-5.
27. Garbarino S, Magnavita N. Work stress and metabolic syndrome in police officers. a prospective study. PLoS One. 2015;10(12):1-15.
28. Mbanya J, Motala A, Sobngwi E, Assah F. Diabetes in sub-Saharan Africa. Lancet. 2010;375(9733):2254-66.
29. Mills KT, Stefanescu A, He J. The global epidemiology of hypertension Katherine. Physiol Behav. 2016;176(1):139-48.
30. Fikenzer S, Fikenzer K, Böhm M, Koch S, Falz R, Busse M, et al. The prevalence of hypertension and risk factors contributing to arterial hypertension in young police officers. J Exp Clin Cardiol. 2014;20(1):280-99.
31. Hussain O, Ajuwon A. Prevalence knowledge and preventive practices against hypertension among police officers in Ibadan. Ann Ib Postgr Med. 2020;18(2):114-21.
32. Douglas KE, Oraekesi CK. Prevalence of hypertension among firefighters in Rivers State, South-South, Nigeria. Niger J Med. 2015;24(3):213-22.
33. 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. Int J Environ Res Public Health. 2021;18(13).
34. Parkash J, Kalhan M, Singhania K, Punia A, Kumar B, Kaushal P. Prevalence of hypertension and its determinants among policemen in a City of Haryana, India. Int J Appl Basic Med Res. 2019;9(3):143.
35. Shaidah JB. Risk Factors of hypertension among security officers of the university of Ghana. Legon Campus. 2016;(10552627):1-65.
36. Bah AO, Bah MF, Fofana FB, Beavogui M. Soldiers' hypertension prevalence in military garrisons in the City of Conakry. Open J Nephrol. 2016:132-7.
37. Ajah A, Amah-Taria, I, Amah-Taria F, Iwu I. Relationship between body mass index and hypertension among police officers in Port Harcourt. J Cardiovasc Disord. 2018;5(1):1-5.
38. Jeoma T, Gentle S. Socio-demographic factors as correlates to high blood pressure among police officers in Obio/Akpor local government area of Rivers State. IIARD Int J Heal Pharm Res. 2022;7(1):23-33.
39. Febyan WK, Thintarso CS, Suastika K. A clinical profile of metabolic syndrome and its determinants among police officers in Bali. Eur J Med Heal Sci. 2020;2(6):2-6.
40. Elliott JL, Lal S. Blood pressure, sleep quality and fatigue in shift working police officers: Effects of a twelve-hour roster system on cardiovascular and sleep health. Int J Environ Res Public Health. 2016;13(2).
41. Ganesh K, Naresh A, Bammigatti C. Prevalence and risk factors of hypertension among male police personnel in urban Puducherry, India. Kathmandu Univeristy Med J. 2014;48(4):242-6.
42. Arredondo G. Incidence of hypertension in a high-risk workgroup (police officers): observational study. Ann Clin Hypertens. 2019;3(1):52-8.
43. Zhang J, Liu Q, Long S, Guo C, Tan H. Prevalence of metabolic syndrome and its risk factors among 10,348 police officers in a large city of China. Medicine (Baltimore). 2019;40(3):20-3.
44. Meerasa A, Dash S. Weighing in on type 2 diabetes remission. Diabetes Care. 2022;45(1):28-30.

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