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Occupational Health Assessment of Hypertension Prevalence and Associated Risk Factors Among Sedentary and Active Workers in the Hohoe Municipality

Obed Woani Konutse[1]*, Forgive Awo Norvivor[2], Prince Narh Puplampu[3] & Atiedu Jennifer[4]

[1]*Department of Epidemiology and Biostatistics - Fred N. Binka School of Public Health, University of Health and Allied Sciences*
[2]*Department of Epidemiology and Biostatistics - Fred N. Binka School of Public Health, University of Health and Allied Sciences*
[3]*School Of Medicine - University of Health and Allied Sciences*
[4]*Department of Epidemiology and Biostatistics - Fred N. Binka School of Public Health, University of Health and Allied Sciences*

***Corresponding author:** Obed Woani Konutse, Department of Epidemiology and Biostatistics - Fred N. Binka School of Public Health, University of Health and Allied Sciences.

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Abstract

Background: *Hypertension continues to be the leading cause of non-communicable disease deaths worldwide. The burden of hypertension was predicted to increase globally from around 0.9 billion in 2000 to 1.6 billion in 2025 in 2005. Also, it was anticipated that 1.4 billion people worldwide suffered from hypertension in 2010, and by 2025, that number is likely to significantly exceed 1.6 billion.*

Objective: *This study sought to determine the prevalence and risk factors of hypertension among sedentary and non-sedentary workers in the Hohoe municipality.*

Method: *A descriptive cross-sectional study design was employed in this study. Kobo Collect was used to collect data among 151 bank employees and 151 police officers. Data collected from respondents exported into STATA v17 for cleaning and analysis. Descriptive and inferential statistics, including multivariable logistic regression, were specified for analyzing the data. A test of p-value <0.05 was considered statistically significant.*

Result: *The study found that 34.4% of sedentary workers and 11.3% of non-sedentary workers were hypertensive. This indicates that hypertension is more prevalent among sedentary workers than among those engaged in non-sedentary occupations. Those aged 40-59 years were 1.30 times more likely to have hypertension compared to those aged 18-39 years. Among non- sedentary workers, being a traditionalist was associated with a 2.65 times higher likelihood of hypertension compared to Christians. There was no statistically significant difference in the proportions of hypertension between sedentary and non-sedentary workers.*

Conclusion: *Sedentary workers have a higher proportion of individuals with hypertension compared to non-sedentary workers. This highlights the detrimental effects of a sedentary lifestyle on cardiovascular health.*

Keywords: Substance Abuse, Chemical Compounds, Diagnosis for Underlying Conditions, Opioid's, Heroin, Cocaine, Drug Manufacturer, ATMP and Vector Control Products, Vaccines.

Introduction

Hypertension is a significant public health issue that affects people worldwide in both economically developed and developing nations [1]. This condition remains the major contributing factor to cardiovascular disease (CVD) which accounted for 17.7 million deaths (45%) globally in 2015 [2]. Over the years, despite extensive knowledge about how to prevent hypertension, it remains one of the leading causes of death worldwide [3]. Hypertension has also remained the leading cause of non-communicable disease deaths worldwide [4]. The burden of hypertension

was predicted to increase globally from around 0.9 billion in 2000 to 1.6 billion in 2025 in 2005 [5]. Also, it was anticipated that 1.4 billion people worldwide suffered from hypertension in 2010, and by 2025, that number is likely to significantly exceed 1.6 billion. The global burden of non-communicable diseases was recorded to be 40.5 million, or 71%, of deaths in 2016. Of these fatalities, 17.9 million, or 44%, were attributable to cardiovascular disease, with hypertension serving as the primary risk factor.

Though the disease is a global public health problem, most people with the condition are found in Sub-Saharan Africa. As the prevalence of hypertension declines in the developed world, it keeps rising in Sub-Saharan Africa Meanwhile it is accounted for 11% of adult deaths in Sub-Saharan Africa [6, 7].

Hypertension has always been regarded as a disease of affluence, but this has changed drastically in the last two decades with average blood pressures now higher in Africa than in Europe and the USA and the prevalence increasing among poor sections of society. Hypertension has become a major threat to the well-being of people in Sub-Saharan Africa as during the last several decades, With the highest blood pressure levels in the world shifting from high-income countries (HIC) to low- and middle-income countries over the past few decades. According to the World Health Organization, an estimated 46% of individuals aged 25 years and older in the African region are affected by hypertension, compared to 35% in the Americas and other high-income countries, and 40% globally [8]. Despite recent advances in the prevention of hypertension worldwide, it remains a significant public health concern, particularly in Sub-Saharan Africa because of a surge in unhealthy habits, subpar healthcare systems, and urbanization [9].

Non-sedentary and sedentary behavior (SB) are known as modifiable cardiovascular disease risk factors [10]. Sedentary behavior is defined as any working behavior that involves an energy expenditure of 1.5 metabolic equivalents of tasks (METs) while sitting or reclining. Sedentary living involves less than 150 minutes of moderate physical activity per week or less than 60 minutes of vigorous physical activity per week. Non-sedentary people are those who do not meet the aforementioned criteria [11]. Due to a shortage of accessible spaces for exercise, an increase in occupational sedentary habits like office work, and an increase in the use of television and other video gadgets, inactive lifestyles are becoming increasingly commonplace across the world.

Increased incidence of sedentary lifestyles and obesity in developed and developing countries is one of the major risk factors for the development of cardiovascular diseases [12]. In a recent study, the difference in blood pressure between physically active and inactive groups was measured at baseline, and after five years, it was found that a sedentary lifestyle contributes to hypertension and CVDs. A significant reduction in diastolic blood pressure in the active group compared to the inactive group was observed age and occupation type are risk factors for metabolic syndrome (MetS). For instance, lawyers, teachers, accountants, doctors, nurses, engineers, managers, and taxi drivers constitute high-risk groups for MetS and individuals 40 years old, having a non-sedentary occupation lowers the risk of MetS. [13].

Despite this, hypertension continues to increase among people working in different fields of jobs, particularly among people whose work demands a long period of ambulation. This study, therefore, seeks to determine the prevalence and risk factors of hypertension among sedentary and non-sedentary workers in the Hohoe municipality.

Materials and Methods

Study Design and Data Source

A quantitative study approach employing the descriptive cross-sectional study design with a pretested structured questionnaire, modified from the WHO STEP-wise approach to non-communicable disease risk factor surveillance was used for this study. Participants were screened for hypertension using blood pressure BP apparatus specifically the Omron M2 Basic digital blood pressure monitor. This study design was selected due to its suitability for collecting data at a single point in time, enabling the measurement of variables in alignment with the study objectives. A descriptive cross-sectional study design is appropriate for characterizing the key attributes of a representative sample at a specific point in time and allow findings to be generalized to a larger target population and useful for hypothesis generation

Study Setting

This study was conducted within five (5) banks and the District Police Station in the Hohoe Municipality. The choice of Hohoe Municipality as the study site is particularly relevant due to its established healthcare infrastructure and the documented burden of hypertension in the area. The municipality is served by several health facilities, with the Volta Regional Hospital, located in Hohoe town, providing secondary healthcare services and acting as a major referral center for smaller health centers and Community-Based Health Planning and Services (CHPS) compounds scattered throughout the rural areas.

The sample size of 302 was calculated for this study was derived using the single proportion population formula by Cochran (1977).

Sampling Technique

Participants were selected using a convenience sampling method. Convenience sampling involves selecting participants based on their availability and willingness to participate in the study. The size of the population for the study may be smaller than the sample size required for the study. Therefore, it is not possible to use random sampling techniques such as simple random sampling or stratified random sampling. Instead, non-probability sampling techniques, such as convenience sampling or purposive sampling, may be appropriate. Convenience sampling method was used to select the participant working in various banks and police stations in the municipal based on their willingness to participate in the study.

Data Collection Methods and Instruments

A standard set of questionnaires were administered to the bankers and police officers. Data was collected from respondents using a modified WHO STEPS questionnaire. Major sections within the questionnaire included Sociodemographic characteristics lifestyle, and dietary habits, proportions of hypertension among sedentary and non-sedentary workers and Socio-demographic factors associated with hypertension and work-related factors

associated with hypertension.,. Anthropometric measurements included weight using a digital weighing scale, height using a tape measure, etc. The blood pressure of respondents were also measured using an electronic sphygmomanometer.

Weight measurements was also takenr on the digital weighing machine, (BednBath model BB- 301 8A), and measurements were recorded to the nearest 0.1 kilograms.

Height was measured using a measuring tape, which recorded up to the nearest 1 centimeter. Body mass index (BMI) was calculated from these two height and weight measurements. That is BMI= weight (Kg) / Height (m)^2. Blood pressure levels of participants both systolic and diastolic were checked with the aid of Omron M2 Basic, Omron Corporation, digital blood pressure monitor with the appropriate cuff size for each participant. Participants were made to rest for 5-10 minutes before their blood pressure was checked. BP was checked three times with 1-2-minute intervals after each check, of which the final reading was recorded. Data collection was done using Kobo collect.

Statistical Analysis

Data collected from respondents were entered into the Kobo Collect application and then exported to STATA v17.0 for analysis. To ensure data quality, the entries were double-checked to resolve any discrepancies. Data were analysed using descriptive statistics. Chi-square tests and logistic regression analyses were performed to determine associations between variables, with p-values of less than 0.05 considered statistically significant at a 95% confidence level. Results were presented in tables.

Ethics Approval and Consent to Participate

This study was conducted in full compliance with the ethical principles outlined in the World Medical Association's Declaration of Helsinki (2024 update), which provides guidelines for medical research involving human participants. The study received approval from the University of Health and Allied Sciences Research Ethics Committee (UHAS-REC) under reference UHAS- REC A.10 [177]22–23. In line with the Declaration of Helsinki, all living participants gave free and informed consent before participating in the study. They were informed about the study's objectives, their right to withdraw at any time without penalty, and the confidentiality of their data. Anonymity was maintained by using unique participant codes, with all data kept secure and confidential. Permission was sort from branch managers of the various banks within Hohoe Municipal Hospital and the District Police Commander of the Hohoe Division before the questionnaires were administered. Participants either signed or thumb-printed an informed consent form, and verbal consent was sought to ensure clarity, particularly for those needing further explanation or preferred verbal communication. The study complied with all relevant ethical guidelines on informed consent, data protection, and participant welfare as outlined in the Declaration of Helsinki.

Results

Socio-Demographic Characteristics of Sedentary and Non-Sedentary Workers

Table 1 shows the socio-demographic characteristics of the respondents, categorized as sedentary workers and non-sedentary workers, with a total of 302 participants. Among the sedentary workers, 45% were female, while among non-sedentary workers, 38.4% were female, and the overall proportion of females in the sample was 41.7%. The mean age of respondents was 35.1 (SD= ± 8.81). Most respondents identified as Ewe (57.6%), followed by Akan (17.9%), Ga/Adangbe (15.2%), Guan (6.0%), and other (3.3%). Most respondents identified as Christian (77.2%), followed by Islam (21.9%) and traditionalist (1.0%). For educational level, 82.1% of sedentary workers had tertiary education compared to 21.9% of non-sedentary workers. The average income per month was higher among sedentary workers (65.6% earned above 1000) than non-sedentary workers (42.4% earned above 1000).

In terms of BMI, sedentary workers had a higher proportion of overweight individuals (38.4%) and obese individuals (23.2%) compared to non-sedentary workers (27.2% and 9.9%, respectively). When it comes to blood pressure, 34.4% of sedentary workers were more likely to have hypertension compared to only 11.3% of non-sedentary workers.

Table 1: Socio-Demographic Characteristics of Respondents

Variable	Sedentary workers	Non-sedentary workers	Total
	n=151 (%)	n =151(%)	n=302 (%)
Sex			
Female	68(45.0)	58(38.4)	126(41.7)
Male	83(55.00)	93(61.6)	176(58.3)
Age (in years) Mean	35.1 (± 8.81)		
18–39	101(66.9)	119(78.8)	220(72.9)
40–59	50(33.1)	32(21.2)	82(72.6)
Ethnic group			
Akan	19(12.6)	35(23.2)	54(17.9)
Ewe	101(66.9)	73(48.3)	174(57.6)
Ga / Adangbe	23(15.2)	23(15.2)	46(15.2)
Guan	6(3.3)	12(8.0)	18(6.0)
Other	2(1.3)	8(5.3)	10(3.3)
Religion Christianity	132(87.4)	101(87.4)	233(77.2)

Islam	18(11.9)	48(31.8)	66(21.9)
Traditionalist	1(0.7)	2(1.3)	3(1.0)
Level of education			
No formal education	5(3.3)	2(1.3)	7(2.3)
Basic education	0(0.0)	4(2.7)	4(1.3)
Secondary education	22(14.6)	112(74.2)	134(44.4)
Tertiary education	124(82.1)	33(21.9)	157(52.0-)
Average income per month			
201 - 400	11(7.3)	14(9.3)	25(8.3)
401 - 600	26(17.2)	34(22.5)	60(19.9)
601 - 1000	15(9.9)	39(25.8)	54(17.9)
Above 1000	99(65.6)	64(42.4)	163(54.0)
BMI Underweight	1(0.7)	5(3.3)	6(2.0)
Normal weight	57(37.8)	90(59.6)	147(48.7)
Overweight	58(38.4)	41(27.2)	99(32.8)
Obese	35(23.2)	15(9.9)	50(16.6)
Systolic Blood Pressure <120	44(29.1)	36(23.8)	80(26.5)
120–139	62(41.1)	90(59.6)	152(50.3)
140–159	45(29.8)	22(14.6)	67(22.2)
≥160	0(0.0)	3(1.0)	3(1.0)
Diastolic Blood Pressure <80	58(38.4)	41(27.2)	99(32.8)
80–89	53(35.1)	76(50.3)	129(42.7)
90–99	32(21.2)	11(7.3)	43(14.2)
≥100	8(5.3)	23(15.2)	31(10.3)
Hypertension Status No Hypertension	99 (65.6)	134(88.8)	233(77.2)
Hypertension	52(34.4)	17(11.3)	69(22.9)

Difference in Proportions of Hypertension Among Sedentary and Non-Sedentary Workers

Table 2 shows the difference in proportions of hypertension among sedentary and non-sedentary workers for various variables. There were 151 individuals in each group. The proportion of individuals with hypertension in the sedentary group was 0.15, while the proportion in the non- sedentary group was 0.13. The difference in proportions between the two groups was 0.02 (p- value=0.614). However, this difference is not statistically significant.

Table 2: Difference in proportions of hypertension among sedentary and non-sedentary

Variable	N	Proportion	Diff.	P-value
Sedentary	151	0.15	0.02	0.614
Non-sedentary	151	0.13		

Socio-Demographic Characteristics Associated with Hypertension Among Sedentary and Non- Sedentary Workers

Table 3 shows the association between demographic characteristics and factors associated with hypertension among sedentary and non-sedentary workers After adjusting for confounding variables, the table revealed that sedentary workers who were males were 2.96 times more likely to be hypertensive [aOR = 2.96(0.83-10.45), p=0.092]. Sedentary workers aged 40–59 years were 3.67 times more likely to be hypertensive as compared to sedentary workers who were aged 18–39 years [aOR = 3.67(1.22-11.09), p=0.021]. It was revealed that Sedentary workers who were Ewes were 86% times less likely to be hypertensive as compared to sedentary workers who were Akans [0.14(0.04-0.58), p=0.006]. It was also revealed that non-sedentary workers who were traditionalists were 8.38 times more likely to be hypertensive as compared to non-sedentary workers Christians [aOR = 8.38(1.15-61.11), p= 0.036]

Table 3: Socio-demographic factors associated with hypertension among sedentary and non-sedentary workers

Variable	Sedentary workers		Non-sedentary workers	
	cOR (95%CI)	aOR (95%CI)	cOR (95%CI)	aOR (95%CI)

Sex Female	Ref.	Ref.	Ref.	Ref.
Male	3.47(1.15-10.53), 0.028	2.96(0.83-10.45),0.092	0. 03(0.95-0.89), 0.946	0.58(0.20-1.67), 0.312
Age				
18–39	Ref.	Ref.	Ref.	Ref.
40–59	1.70(0.79-2.60), 0.000	3.67(1.22-11.09),0.021	0 .26(0.70-1.23), 0.590	1.89(0.59-6.05), 0.693
Ethnic group				
Akan	Ref.	Ref.	Ref.	
Ewe	1.05(0.09-2.01), 0.032	0.14(0.04-0.58),0.006	1.41(2.59-0.24), 0.018	
Ga / Adangbe	0.82(0.49-2.13), 0.220	016(0.02-1.17),0.071	0.23(1.03-1.50), 0.716	
Guan	1.91(0 .99-4.81), 0.197	0.08(0.00-2.04),0.125	0.44(1.41-2.30), 0.637	
Other	0.15(1.72-2.02), 0.197	3.81(0.22-64.69),0.355	1.41(2.59-0.24), 0.018	
Religion Christianity	Ref.	Ref.	Ref.	
Islam	0.85(1.25-2.88), 0.734	1.22(0.26-2.19), 0.013	2.09(0.77-5.67),0.150	
Traditionalist	0.05(2.88-2.98), 0.974	2.82(1.07- 4.57), 0.002	8.38(1.15-61.11), 0.036	
Level of education No formal education	Ref.	Ref.		
Basic education	0.14(3.92-4.20), 0.945	0.14(3.91-4.20), 0.945		
Secondary education	0.12(3.03-2.84), 0.938	0.34(2.58-3.267), 0.819		
Tertiary education	0.50(2.41-3.40), 0.738	0.15(3.10-6.79), 0.919		
Average income per month				
201 - 400	Ref.	Ref.		
401 - 600	1.22(2.77-5.22), 0.549	0.57 (0.05-33.63), 0.736		
601 - 1000	0.66(2.31-3.63), 0.665	0.49(0.02-0.02), 0.668		
Above 1000	0.52(2.39-6.42), 0.727	1.83(0.09-37.72), 0.694		
BMI				
Underweight	Ref.	Ref.	Ref.	Ref.
Normal weight	1.30(2.68-5.27), 0.522	1.08(3.03-3.03), 0.607	1.29(2.67- 5.28), 0.522	0.17(0.41-4.08), 0.939
Overweight	1.12(2.84-5.11), 0.579	0.21(3.95-4.35), 0.925	2.31(0.96-5.57), 0.166	1.61(2.01-5.22), 0.384
Obese	2.06(0.76-4.88), 0.152	1.43(1.40-4.27), 0.322	1.84(0. .98-4.67), 0.201	1.23(1.69- 4.16), 0.407

Work-Related Factors Associated with Hypertension Among Sedentary and Non-Sedentary Workers

Table 4 shows the work-related factors associated with hypertension among sedentary and non-sedentary workers in the study. In terms of years at the current occupation, both sedentary and non-sedentary workers with hypertension were more likely to have been in their job for over 10 years compared to workers without hypertension. The proportion of non-sedentary workers with hypertension who had been on the job for over 10 years was significantly higher (63.2%) than the proportion of those without hypertension (38.6%).

For job demands, highly demanding jobs were more prevalent among workers with hypertension. The proportion of non-sedentary workers with hypertension who had highly demanding jobs was much higher (89.5%) than the proportion of those without hypertension (62.9%). The proportion of sedentary workers with hypertension who rarely or never took breaks was 45.5%, compared to 33.3% of those without hypertension. Similarly, the proportion of non-sedentary workers with hypertension who rarely or never took breaks was 42.1%, compared to 25.8% of those without hypertension.

Table 4: Work-Related Factors Associated with Hypertension Among Sedentary and Non-Sedentary Workers

Sedentary workers			Non-sedentary workers	
Variable	**No hypertension n =129 (%)**	**Hypertension n =22 (%)**	**No hypertension N=132 (%)**	**Hypertension n= 19 (%)**

Years at current occupation 1-5 years	36(27.91)	5(22.7)	38(28.8)	3(15.8)
5 - 10 years	40(31.0)	3(13.6)	33(25.0)	4(21.1)
less than 1 year	31(24.0)	4(18.2)	10(7.6)	0(0.0)
More than 10 years	22(17.1)	10(45.5)	51(38.6)	12(63.2)
Description of job demand Highly Demanding	47(36.4)	7(31.8)	83(62.9)	17(89.5)
Moderately	26(20.2)	14(63.6)	49(37.1)	2(10.5)
Demanding Less Demanding	56(43.4)	1(4.6)	0(0.0)	0(0.0)
Ever experienced any work-related stressors	41(31.8)	5(22.7)	50(37.9)	0(0.0)
Not really	35(27.1)	3(13.6)	36(27.3)	7(36.8)
Yes	53 (41.1)	14(63.6)	45(34.9)	12(63.2)
Breaks during work				
Once a day	39(30.2)	7(31.8)	24(18.2)	3(15.8)
Rarely or Never	43(33.3)	10(45.5)	34(25.8)	8(42.1)
Three or more	6(4.7)	2(9.1)	44(33.3)	7(36.8)
times a day Twice a day	41(31.8)	3(13.6)	30(22.7)	1(5.3)
Have control over workload				
No	72(55.8)	13(59.1)	92(69.7)	13(68.4)
Not really	23(17.8)	4(18.2)	32(24.3)	5(26.3)
Yes	34(26.4)	5(22.7)	8(6.1)	1(5.3)
Opportunity for physical activities during your workday No	75(58.1)	14(63.6)	42(31.8)	8(42.1)
Not really	31(24.0)	0(0.0)	36(27.3)	10(52.6)
Yes	23(17.8)	8(36.4)	54(40.9)	1(5.3)

Work-Related Factors Associated with Hypertension Among Sedentary and Non-Sedentary Workers

Table 5 shows the association between Work-related factors and factors associated with hypertension among sedentary and non-sedentary workers. After adjusting for confounding variables, sedentary workers who had fewer demanding jobs were 3.73 times more likely to be hypertensive as compared to sedentary workers highly demanding [aOR = 3.73(1.31-10.67),0.014]. It was also revealed that, sedentary workers who had control over their work load were 6.44 times more likely to be hypertensive as compared to sedentary workers who had no control over their work load [aOR = 1.46(0.37- 5.73), p= 0.009].

Table 5: Work-Related Factors Associated with Hypertension Among Sedentary and Non-Sedentary Workers

Variable		Sedentary workers	Non-sedentary workers	
Years at current	cOR (95%CI)	aOR (95%CI)	cOR (95%CI)	aOR (95%CI)
occupation 1 - 5 years	Ref.		Ref.	
5 - 10 years	0.57 (0.46-1.59), 0.441		1.48(0.34- 6.43), 0.603	
less than 1 year	0.94(0.25-3.59), 0.938		0.52(0.03-10.96), 0.677	
more than 10 years	3.09(0.97-9.86), 0.056		2.67(0.76-9.32), 0.126	
Description of job demand Highly Demanding	Ref.		Ref.	
Less Demanding	10.76(4.06-28.49), 0.000	3.73(1.31-10.67),0.014	0.09(0.01- 1.64), 0.106	0.41(0.00-0.264), 0.081

Moderately Demanding	0.27(0.05-1.61), 0.152	0.16(0.03-0.99),0.148	0.18(0.05-0.71), 0.014	0.33(0.08-1.38), 0.130
Work-related stressors experienced				
No	Ref.		Ref.	Ref.
Not really	1.04(0.56 – 1.88),0.894		19.43(1.09-345.65), 0.043	14.92(0.81-273.76), 0.069
Yes	0.80(0.47–1.36), 0.402		21.26(1.24- 0.035),0.035	22.68(1.29- 396.58), 0.332
Breaks during work				
Once A Day	Ref.		Ref.	
Rarely or Never	1.35(0.72-2.52), 0.346		1.72 (0.45-6.64), 0.305	
Three Or More Times A Day Twice A Day	10.86(4.49– 26.28), 0.00 1.20(0.62-2.32), 0.588		1.18 (0.30-4.60), 0.812 0. .34 (0.47-2.51), 0.292	
Have control over workload No	Ref.	Ref.	Ref.	
Not really	1.12(0.63-1.97), 0.722	1.75(0.41-7.51),0.451	1.22(0.43-3.42), 0.712	
Yes	0.19(0.09-0.41), < 0.000	1.46(0.37- 5.73), 0.009	0.42(0.07-2.31), 0.316	
Opportunity for physical activities during your workday No	Ref.	Ref.	Ref.	
Not really	2.64(1.49-4.68), 0.001	0.02(0.00-0.48), 0.015	0.56(0.01-28.27), 0.769	
Yes	3.16(1.80-5.53),0.000	1.42(0.43-4.65), 0.564	0.62(0.01-31.54),0.812	

Association of Sedentary Lifestyle with the Risk of Hypertension

In Table 6, the association of sedentary lifestyle with the risk of hypertension is examined. The table reports the number (n) and percentage (%) of participants with hypertension and no hypertension, as well as the chi-square value and p-value.

Among the physical activity variables, those who engaged in physical activity less than once a week had the highest prevalence of hypertension 13(4.3%) compared to those who engaged in physical activity 1-2 times per week 6(2.0%), 3-4 times per week 8(1.7%), or 5 or more times per week 14 (4.6%). The difference in hypertension prevalence across these categories was statistically significant (($\chi2$= 14.94, p = 0.005). Regarding dietary factors, there was no statistically significant association between hypertension and the frequency of salty or high- sodium food consumption (($\chi2$= 2.70, p = 0.609) or fruit and vegetable consumption (($\chi2$= 3.30, p = 0.509). However, among those who consumed caffeine beverages, those who reported never consuming caffeine had a lower prevalence of hypertension 15 (5.0%) compared to those who consumed caffeine rarely 16 (5.3%), sometimes 12 (4.0%), often 14(4.6%), or very often 12(4.0%). The difference in hypertension prevalence across these categories was statistically significant (($\chi2$= 15.15, p = 0.004).

Similarly, a statistically significant association was observed between the use of cigarettes or tobacco products and hypertension, with users exhibiting a higher prevalence (61 individuals; 20.2%) compared to non-users (8 individuals; 2.0%) (χ^2 = 10.80, p = 0.029).. There was no statistically significant association between being diagnosed with other health conditions and hypertension (($\chi2$= 3.30, p = 0.192).

Table 6: Association of Sedentary Lifestyle with the Risk of Hypertension

Variable	Hypertension n =233 (%)	No hypertension n =69 (%)	Chi square	P-value
How often do you engage in physical activity less than once a week	13(4.3)	72(23.8)	14.94	0.005
1 - 2 times per week	6(2.0)	33(10.9)		
3 4 times per week	8(1.7)	35(11.6)		
5 or more times per week	14(4.6)	49(16.2)		
I do Not engage in	24(9.3)	44(14.6)		

physical activity				
How often do you consume salty or high-sodium food?				
Never	2(0.7)	13(4.3)	2.70	0.609
Rarely	17(5.6)	73(24.1)		
Sometimes	19(6.3)	56(18.6)		
Often	18(6.0)	47(15.6)		
Very often	13(4.3)	44(14.6)		
How often do you consume fruits and vegetables? Never	0(0.0)	3(1.0)	3.30	0.509
Rarely	13(4.3)	31(10.3)		
Sometimes	24(8.0)	82(27.15)		
Often	16(5.3)	46(15.2)		
Very often	16(5.3)	71(23.5)		
How often do you consume caffeine beverages?				
Never	15(5.0)	17(5.6)	15.15	0.004
Rarely	16(5.3)	77(25.5)		
Sometimes	12(4.0)	65(21.5)		
Often	14(4.6)	37(15.3)		
Very often	12(4.0)	37(15.3)		
Do you consume alcohol? No	22(7.3)	90(29.8)	1.24	0.265
Yes	47(15.6)	143(47.4)		
Do you smoke cigarette or tobacco products Yes	61(20.2)	212(70.2)	10.80	0.029
No	8(2.0)	21(6.4)		
Been diagnosed of other health condition Not sure	15(5.0)	30(9.9)	3.30	0.192
No	42(13.9)	159(52.7)		
Yes	12(4.0)	44(14.6)		

Discussion

The study findings suggest several socio-demographic factors were associated with hypertension among workers in the Hohoe Municipality. The analysis reveals that certain demographic characteristics such as age, ethnicity, and level of education are significantly associated with hypertension in both sedentary and non-sedentary workers. Sedentary workers aged 40-59 years were found to be more likely to be hypertensive compared to those aged 18-39 years. This finding suggests that there is a need for targeted preventive measures and effective interventions specifically designed for sedentary workers in the middle-age group to reduce their risk of developing hypertension and improve overall cardiovascular health [14]. Comparatively, in another study, it was found that people aged 20 years and above have the risk of developing hypertension.

This aligns with existing literature, which emphasizes that advancing age is a significant risk factor for hypertension [15]. The increased likelihood of hypertension in the older age group can be attributed to physiological changes, including decreased arterial compliance and increased arterial stiffness, which are more prevalent with age [16]. The finding that male sedentary workers were 2.96 times more likely to be hypertensive compared to female sedentary workers [aOR = 2.96(0.83-10.45), p=0.092] aligns with previous research indicating that males may have a higher risk of hypertension. This finding highlights the need for targeted interventions and risk-reduction strategies specifically tailored towards sedentary male workers. The gender difference in hypertension prevalence has been observed in various studies and is believed to be influenced by both biological and behavioral factors [17, 18]. Biologically, hormonal differences between males and females may contribute to variations in blood pressure regulation. Estrogen, found in higher levels in females, has been shown to have a protective effect on blood vessels and may

help lower blood pressure. On the other hand, testosterone, more prevalent in males, has been associated with higher blood pressure levels.

The study suggests that workers identifying as Ewes were less likely to have hypertension compared to those identifying as Akan. The influence of ethnicity on hypertension has been a topic of interest in various studies, but findings have been inconsistent. Some studies have linked specific genetic predispositions within certain ethnic groups to a higher risk of hypertension while others suggest that cultural differences in dietary habits and lifestyle practices might contribute to variations in hypertension prevalence among different ethnicities [19, 20]. In addition, it has been reported that comparing ethnic or racial groups in the United States, African Americans and other people of African descent show a higher incidence of hypertension and its related comorbidities.

The study also indicates that non-sedentary workers belonging to certain religious groups were more likely to have hypertension compared to workers from other religious backgrounds. This finding reveals the potential influence of cultural and religious practices on health outcomes. Various studies have highlighted the impact of religious practices on lifestyle choices, including dietary habits and stress management, which can have implications for cardiovascular health [21]. Further exploration of the specific religious practices and their potential influence on hypertension within the context of the Hohoe Municipality is warranted to gain a more comprehensive understanding of this relationship. Comparatively, in a study it was found that, religious practices influence management of hypertension [22]. The present study however is consistent with finding from [23]. The study reported that there is an association between frequency of attendance at religious services and hypertension or blood pressure, but this association is not uniform for all religious groups.

The analysis of the difference in proportions of hypertension between sedentary and non-sedentary workers did not yield statistically significant results (p-value = 0.614). This suggests that, within the Hohoe Municipality, there is no substantial disparity in the prevalence of hypertension between these two groups of workers. This finding, if not the first, will be one among the few studies that found no difference in hypertension among sedentary and non-sedentary workers association. However, it is important to note that a sedentary lifestyle has been widely recognized as a significant risk factor for various health conditions, including hypertension. For instance, reported that both diabetes and hypertension are highly prevalent in individuals with sedentary occupations which disagrees with the present study finding [24]. Reason behind this is that prolonged sitting and a lack of physical activity can contribute to the development of hypertension by affecting blood circulation and metabolic functions [25]. The lack of a significant difference in this study could potentially be attributed to the presence of other influential factors that may have masked the direct impact of sedentary behavior on hypertension in this specific population. The study findings suggest several work-related factors that are significantly associated with hypertension among both sedentary and non-sedentary workers in the Hohoe Municipality [26, 27].

The study suggests that sedentary workers with less demanding jobs were more likely to be hypertensive compared to those with highly demanding occupations. This finding contrasts with common assumptions about job demand and its association with hypertension. A discrepancy of stress as a risk of hypertension. High job demand has often been linked to increased stress levels and a higher risk of hypertension [28, 29]. This is because high work-related stress is widely known to increase the risk of developing metabolic syndrome which can result in hypertension [30]. However, the specific nature of job demands and stressors within the Hohoe Municipality might differ from those in other contexts, leading to this unexpected result. Further exploration of the specific aspects of job demands that contribute to hypertension is warranted to fully understand this relationship [31, 32]. The study indicates that sedentary workers who reported having control over their workload were more likely to experience hypertension compared to those who had less control. Controlling work load does not take away the stress. This finding is in line with emerging research that emphasizes the detrimental health effects of high job control, which can lead to increased job strain and subsequent health implications [33]. This association highlights the need to consider not only the demands of the job but also the impact of control and decision-making autonomy on the physiological stress response among sedentary workers in the Hohoe Municipality. Other study also argues that low job control puts an individual at risk of hypertension [34]. This difference may be attributed to the nature of work the respondents in each study.

The findings suggest a significant association between Caffeine Consumption, Smoking Habits, and physical activity levels, and the risk of hypertension among workers in the Hohoe Municipality. Those who engaged in physical activity less than once a week were found to have a higher prevalence of hypertension compared to those who engaged in physical activity more frequently [35].

This result is in line with extensive research emphasizing the detrimental effects of a sedentary lifestyle on cardiovascular health. A lack of regular physical activity has been consistently identified as a major risk factor for hypertension, as it contributes to weight gain, poor circulation, and the development of other metabolic disorders [36]. Even after development of hypertension, moderate physical activity also plays a role in bringing the blood pressure down. If you sit for several hours a day, try to take 5- to 10-minute breaks each hour to stretch and move. An inactive, also called sedentary lifestyle is linked to many chronic health conditions, including high blood pressure [37]. People sitting almost their time at work are recommended to take breaks from prolong sitting, exercise regularly and decrease their leisure sitting to reduce the risk of poor health. Encouraging regular physical activity and implementing workplace wellness programs aimed at promoting active lifestyles among workers in the Hohoe Municipality may be crucial in mitigating the risk of hypertension and improving overall cardiovascular health [38].

Conclusion

In conclusion, this study on the prevalence and risk factors of hypertension among sedentary and non-sedentary workers in the Hohoe municipality has provided important insights into the burden of hypertension in this population. The findings indicate

that sedentary workers have a higher proportion of individuals with hypertension compared to non-sedentary workers. This highlights the detrimental effects of a sedentary lifestyle on cardiovascular health.

The study also identified several socio-demographic and work-related factors associated with hypertension among both sedentary and non-sedentary workers. Socio-demographic factors such as age, were found to be significant predictors of hypertension. Additionally, work-related factors such as job demands and duration of occupation were also associated with an increased risk of hypertension [39, 40].

Strength and Limitation

This study provides an important contribution to literature on non-communicable diseases in occupational health in Ghana, specifically addressing the comparative burden of hypertension among sedentary and non-sedentary workers. A significant strength of this research is its clear and practical operationalization of "sedentary" and "non-sedentary" lifestyles by selecting two distinct, well-defined professional groups (bank employees and police officers). The study enhanced its validity by employing objective clinical measurements, including standardized protocols for assessing blood pressure, height, and weight, which strengthens the findings beyond self-reported data and reduces outcome misclassification. The use of multivariable logistic regression to control for potential confounders such as age, gender, and BMI adds analytical rigor, allowing for a more precise estimation of the independent associations between risk factors and hypertension. However, the study has several limitations. First, the use of a cross-sectional design, although useful for assessing prevalence, inherently restricts the ability to establish causal relationships.

The temporal sequence of events cannot be determined, leaving open the possibility of reverse causality. Second, a convenience sampling approach, while useful in this specific context given the logistical challenges of accessing these specific workforce populations, introduces a high potential for selection bias and significantly limits the generalizability of the findings to all bankers and police officers in Ghana or similar settings. Third, a notable methodological limitation was the difficulty in adhering to the recommended 30-minute rest period prior to blood pressure measurement for many participants. This protocol deviation likely led to elevated readings and a potential overestimation of the true hypertension prevalence. Additionally, while some data were objective, key variables related to lifestyle habits, work stressors, and dietary patterns were self- reported, making them susceptible to recall and social desirability biases. Despite these limitations, the findings successfully highlight a significant disparity in hypertension burden between occupational groups and identify modifiable risk factors, offering a valuable foundation for designing targeted workplace health interventions and informing future longitudinal research in this critical area of public health.

Recommendation for Future Research

For future research, we recommend that researches delve deeper to examine the underlying cause of hypertension among sedentary and non sedentary workers, specifically, studies should explore factors such as dietary patterns, the distance of participants homes from their workplaces and whether participants owning vehicles could be a significant risk factors. This will help to identify precise risk factors contributing to hypertension among this population.

Clinical Trial Number

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Data Availability

All relevant data are within the manuscript and its Supporting Information files.

Reference

1. Kishore, J., Gupta, N., Kohli, C., & Kumar, N. (2016). Prevalence of hypertension and determination of its risk factors in rural Delhi. International Journal of Hypertension, 2016.
2. World Health Organization. (2017). World health statistics 2017: Monitoring health for the SDGs. Retrieved from http://apps.who.int/iris/bitstream/handle/10665/255336/9789241565486-eng.pdf
3. Olsen, M. H., Angell, S. Y., Asma, S., Boutouyrie, P., Burger, D., Chirinos, J. A., Damasceno, A., Delles, C., Gimenez-Roqueplo, A.-P., Hering, D., López-Jaramillo, P., Martinez, F., Perkovic, V., Rietzschel, E. R., Schillaci, G., Schutte, A. E., Scuteri, A., Sharman, J. E., Wachtell, K., & Wang, J. G. (2016). A call to action and a lifecourse strategy to address the global burden of raised blood pressure on current and future generations: The Lancet Commission on hypertension. The Lancet, 388(10060), 2665–2712. https://doi.org/10.1016/s0140-6736(16)31134-5
4. World Health Organization. (2023, March 16). World Health Organization (WHO).
5. Kearney, P. M., Whelton, M., Reynolds, K., Muntner, P., Whelton, P. K., & He, J. (2005). Global burden of hypertension: Analysis of worldwide data. The Lancet, 365(9455), 217–223. https://doi.org/10.1016/S0140-6736(05)17741-1
6. Jessen, N., Damasceno, A., Silva-Matos, C., Tuzine, E., Madede, T., Mahoque, R., & Lunet, N. (2018). Hypertension in Mozambique: Trends between 2005 and 2015. Journal of Hypertension, 36(4), 779–784.
7. Owolabi, M. O., Akarolo-Anthony, S., Akinyemi, R., Arnett, D., Gebregziabher, M., Jenkins, C., Tiwari, H., Arulogun, O., Akpalu, A., Sarfo, F. S., Obiako, R., Owolabi, L., Sagoe, K., Melikam, S., Adeoye, A. M., Lackland, D., Ovbiagele, B., & Members of the H3Africa Consortium. (2015). The burden of stroke in Africa: A glance at the present and a glimpse into the future. Cardiovascular Journal of Africa, 26(2 Suppl 1), S27–S38. https://doi.org/10.5830/CVJA-2015-038
8. World Health Organization. (2020). Physical inactivity: A global public health problem. Retrieved from https://www.who.int/dietphysicalactivity/factsheet_inactivity/en/
9. BeLue, R., Okoror, T. A., Iwelunmor, J., Taylor, K. D., Degboe, A. N., Agyemang, C., & Ogedegbe, G. (2019). An overview of cardiovascular risk factor burden in sub-Saharan African countries: A socio-cultural perspective. Globalization and Health, 5, 1–12.

10. Lavie, C. J., Ozemek, C., Carbone, S., Katzmarzyk, P. T., & Blair, S. N. (2019). Sedentary behavior, exercise, and cardiovascular health. Circulation Research, 124(5), 799–815.
11. Parvin, N., & Nath, M. C. (2020). Comparison of cardiovascular risk factors between sedentary and non-sedentary workers in Rajshahi Metropolitan Area. Journal of Dental and Medical Sciences, 19(2), 41–46.
12. Yeasmin, F., Nessa, A., Rahman, M. M., Huq, M. M., Afroz, L., Sharmin, T., & Ferdous, A. (2023). A comparative study of body mass index and blood pressure between sedentary and non-sedentary workers. Mymensingh Medical Journal: MMJ, 32(1), 61–64.
13. Chen, M., Chiu, C., & Chen, S. (2021). Risk assessment of metabolic syndrome prevalence involving sedentary occupations and socioeconomic status. BMJ Open, 11(12), e042802. https://doi.org/10.1136/bmjopen-2020-042802
14. Joho, A. A. (2021, June 15). Using the Health Belief Model to explain the patient's compliance to anti-hypertensive treatment in three district hospitals - Dar Es Salaam, Tanzania: A cross-section study. https://scite.ai/reports/10.24248/eahrj.v5i1.651
15. Centers for Disease Control and Prevention. (2023). Know your risk for high blood pressure. Retrieved from https://www.cdc.gov/bloodpressure/risk_factors.htm
16. Großschädl, F., Stolz, E., Mayerl, H., Rásky, É., Freidl, W., & Stronegger, W. (2015). Prevalent long-term trends of hypertension in Austria: The impact of obesity and socio-demography. PLoS ONE, 10(10), e0140461. https://doi.org/10.1371/journal.pone.0140461
17. Vincent, G. E., Jay, S. M., Vandelanotte, C., & Ferguson, S. A. (2017). Breaking up sitting with light-intensity physical activity: Implications for shift workers. International Journal of Environmental Research and Public Health, 14(10), 1233.
18. Zilbermint, M., Hannah-Shmouni, F., & Stratakis, C. A. (2019). Genetics of hypertension in African Americans and others of African descent. International Journal of Molecular Sciences, 20(5), 1081.
19. Patel, R., Masi, S., & Taddei, S. (2017). Understanding the role of genetics in hypertension. European Heart Journal, 38(30), 2309–2312. https://doi.org/10.1093/eurheartj/ehx273
20. Xie, R., Liao, P., Yin, R., Hu, X., Huang, J., Wei, D., Li, H., Huang, F., Yao, L., Pan, S., Yang, D., & Lin, W. (2015). Prevalence of hypertension and associated risk factors in Chinese Jing compared with Mulao populations. Journal of International Medical Research, 43(6), 819–833. https://doi.org/10.1177/0300060515587579
21. Kawachi, I. (2019). Religion as a social determinant of health. American Journal of Epidemiology. https://doi.org/10.1093/aje/kwz204
22. Kent, B. V., Upenieks, L., Kanaya, A. M., Warner, E. T., Cozier, Y. C., Daviglus, M. L., & Shields, A. E. (2023). Religion/spirituality and prevalent hypertension among ethnic cohorts in the study on stress, spirituality, and health. Annals of Behavioral Medicine. https://doi.org/10.1093/abm/kaad007
23. Bell, C. N., Bowie, J. V., & Thorpe, R. J., Jr. (2012). The interrelationship between hypertension and blood pressure, attendance at religious services, and race/ethnicity. Journal of Religion and Health, 51(2), 310–322. https://doi.org/10.1007/s10943-010-9346-7
24. Gao, Y., Xie, X., Wang, S., Li, H., Tang, H., Zhang, J., & Yao, H. (2017). Effects of sedentary occupations on type 2 diabetes and hypertension in different ethnic groups in northwest China. Diabetes & Vascular Disease Research, 14(5), 372–375. https://doi.org/10.1177/1479164117696050
25. Mackie, P., Weerasekara, I., Crowfoot, G., Janssen, H., Holliday, E., Dunstan, D., & English, C. (2019). What is the effect of interrupting prolonged sitting with frequent bouts of physical activity or standing on first or recurrent stroke risk factors? A scoping review. PLoS ONE, 14(6), e0217981. https://doi.org/10.1371/journal.pone.0217981
26. American Heart Association. (2023). Smoking, high blood pressure and your health. Retrieved from https://www.heart.org/en/health-topics/high-blood-pressure/changes-you-can-make-to-manage-high-blood-pressure/smoking-high-blood-pressure-and-your-health
27. Andriani, H., Kosasih, R., Putri, S., & Kuo, H. (2020). Effects of changes in smoking status on blood pressure among adult males and females in Indonesia: A 15-year population-based cohort study. BMJ Open, 10(10), e038021. https://doi.org/10.1136/bmjopen-2020-038021
28. Gamage, A., & Seneviratne, R. (2016). Perceived job stress and presence of hypertension among administrative officers in Sri Lanka. Asia-Pacific Journal of Public Health, 28(1 Suppl), 41S–52S. https://doi.org/10.1177/1010539515598834
29. Yoo, D., Kang, M., Paek, D., Min, B., & Cho, S. (2014). Effect of long working hours on self-reported hypertension among middle-aged and older wage workers. Annals of Occupational and Environmental Medicine, 26(1), 25. https://doi.org/10.1186/s40557-014-0025-0
30. Garbarino, S., & Magnavita, N. (2015). Work stress and metabolic syndrome in police officers: A prospective study. PLoS ONE, 10(12), e0144318. https://doi.org/10.1371/journal.pone.0144318
31. De Giuseppe, R., Di Napoli, I., Granata, F., Mottolese, A., & Cena, H. (2019). Caffeine and blood pressure: A critical review perspective. Nutrition Research Reviews, 32(2), 169–175.
32. Farraj, A., Akeredolu, T., Wijeyesekera, A., & Mills, C. (2024). Coffee and cardiovascular health: A review of literature. Nutrients, 16(24), 4257. https://doi.org/10.3390/nu16244257
33. Dutheil, F., Charkhabi, M., Ravoux, H., Brousse, G., Dewavrin, S., Cornet, T., Mondillon, L., Han, S., Pfabigan, D., Baker, J., Mermillod, M., Schmidt, J., Moustafa, F., & Pereira, B. (2020). Exploring the link between work addiction risk and health-related outcomes using the job-demand-control model. International Journal of Environmental Research and Public Health, 17(20), 7594. https://doi.org/10.3390/ijerph17207594
34. Chantarat, T. (2023). Predicting the onset of hypertension for workers. Retrieved from https://www.nature.com/articles/s41371-022-00666-0
35. James, J., Baldursdottir, B., Jóhannsdóttir, K., Valdimarsdottir, H., & Sigfusdottir, I. (2018). Adolescent habitual caffeine consumption and hemodynamic reactivity during rest, psychosocial stress, and recovery. Journal of Psychosomatic Research, 110, 56–63.
36. Leung, A., Bushnik, T., Hennessy, D., McAlister, F., & Manuel, D. (2019). Risk factors for hypertension in Canada.

Health Reports, 30(2), 3–13.
37. Dempsey, P. C., Friedenreich, C. M., Leitzmann, M. F., Buman, M. P., Lambert, E., Willumsen, J., & Bull, F. (2020). Global public health guidelines on physical activity and sedentary behavior for people living with chronic conditions: A call to action. Journal of Physical Activity and Health, 18(1), 76–85.
38. Mesas, A., León-Muñoz, L., Rodríguez-Artalejo, F., & López-García, E. (2011). The effect of coffee on blood pressure and cardiovascular disease in hypertensive individuals: A systematic review and meta-analysis. The American Journal of Clinical Nutrition, 94(4), 1113–1126. https://doi.org/10.3945/ajcn.111.016667
39. World Health Organization. (2023). The global health observatory: Noncommunicable diseases – Mortality. Retrieved from https://www.who.int/data/gho/data/themes/topics/topic-details/GHO/ncd-mortality
40. World Health Organization. (2023). Hypertension. https://www.who.int/news-room/fact-sheets/detail/hypertension