



## Age, Tobacco Smoking, and Excessive Alcohol Intake as Risk Factors for Cardiovascular Diseases Among Civil Servants in Port Harcourt, Nigeria

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### Abstract

The implication of age, tobacco smoking, and high alcohol consumption as risk factors for cardiovascular diseases among civil servants in Port Harcourt, Nigeria, was investigated in this study. The civil service workforce in sub-Saharan Africa is a unique group that is often characterized by sedentary behaviour and occupational stress, as the burden of non-communicable diseases increases. A descriptive survey design was employed, utilizing a systematic sampling technique to select 500 junior and senior civil servants from ten randomly selected ministries within the Rivers State Secretariat. A total of 494 respondents correctly filled out the researcher's validated structured questionnaire, making the final sample. Reliability was established via the test-retest method ( $r = 0.78$ ). The analysis of the data was done with descriptive statistics to create the demographic profiles, while Chi-square ( $\chi^2$ ) inferential statistics were applied to test the hypotheses at the 0.05 level of significance. Findings show that age ( $\chi^2 = 144.42$ ), cigarette smoking ( $\chi^2 = 83.26$ ), and excessive alcohol consumption ( $\chi^2 = 732.52$ ) were all significant risk factors for cardiovascular issues in the subjects. The study concludes that modifiable lifestyle behaviours, compounded by advancing age, pose a severe threat to the workforce's health. It is advised that government and non-governmental organisations implement obligatory workplace wellness plans, lay down stringent regulations on selling tobacco and alcohol, and implement regular heart screening for civil servants to ensure the sustainability of the workforce.

**Keywords:** Cardiovascular System, Risk Factors, Age, Excessive Alcohol Intake, Cigarette Smoking.

### Introduction

The global epidemiological landscape has shifted dramatically in recent decades, with non-communicable diseases (NCDs), particularly cardiovascular diseases (CVDs), replacing infectious diseases as the leading causes of morbidity and mortality. The cardiovascular system (CVS) is the system that comprises the heart and blood vessels (arteries, veins, and capillaries) of an organism. The CVS is responsible for homeostasis (Igbanugo & Ogunleye, 2016; Seeley et al., 2008). Nevertheless, a system undergoes degeneration due to disease. The burden of CVD in sub-Saharan Africa and Nigeria, in particular, is rising rapidly due to urbanization, lifestyle change, and aging (Yusuf et al., 2020; Adeke et al., 2022). State officials are a segment of the Nigerian economy that is essential. However, they are increasingly at risk of this epidemiological transition. Recent studies suggest that the "white-collar" nature of the civil service often predisposes employees to sedentary lifestyles, which, when combined with behavioural risk factors, creates a perfect storm for heart disease (Babatunde et al., 2020; Eshiet et al., 2024). The functioning of the cardiovascular system will depend upon not having major risk factors. According to the American Heart Association (2004) and the American College of Cardiology, risk factors that have gone untreated can produce CVD with time. Generally, these factors are divided into non-modifiable (age, heredity, gender) and modifiable (tobacco smoking, alcohol intake, obesity, sedentary behaviour, and diet) (Foss & Keteyian, 1998; Babatunde et al., 2020). Age is the strongest non-modifiable predictor of cardiovascular health. The risk of developing coronary heart disease, including mortality and morbidity, sharply increases as age advances (Tian et al., 2023). As we age chronologically, arterial stiffening occurs along with endothelial dysfunction, and there is a decline in output. While biological ageing differs

from one individual to another (some are “biologically young” at the age of 60), the statistical probability of hypertension and stroke doubles every decade from the age of 55 (Corbin et al., 2002; The Merck Manual, 2004). The clustering of risks occurs faster among civil servants aged over 40 years in Nigeria, making it more difficult to manage the health of the workforce (Olawuyi & Adeoye, 2018; Aladeniyi et al., 2021). Cigarette smoking is a potent accelerator of vascular damage. The mechanisms are nicotine-induced release of catecholamines, which raise blood pressure, hypoxia from carbon monoxide, and oxidative damage to the endothelium (Norman, 1997; Banks et al., 2019). Smoking shows lower prevalence in some Nigerian populations compared to some Western countries. We know that smoking impacts the cardiovascular system. This impact is worse than the prevailing lower prevalence of smoking. The reason is that support to stop smoking is lacking in Nigeria. Moreover, other risk factors are also prevailing (Ruan et al., 2018; Adeke et al., 2022). In addition, environmental tobacco smoke (ETS) exposure remains a significant concern for non-smokers in settings with inadequate regulation (Corbin et al., 2002).

There is a complicated relationship between alcohol and heart health. During the past several years, it was seen that the consumption of alcohol had a J-shaped curve. The previous evidence suggested that the light consumption of alcohol might be protective. However, new data from recent studies show that there is an increase in risk of hypertension, cardiomyopathy, and stroke when there is regular and heavy consumption of alcohol (Biddinger et al., 2022; Rana et al., 2025). Contextually, within Port Harcourt and the Niger Delta, alcohol intake consciously forms part of leisure and stress-relieving activities. Excessive intake, however, acts as a depressant and a toxin to the myocardium, causing arrhythmias and increasing systolic blood pressure (Adeyemo, 2004; Maduka & Ojimah, 2020). Even as these risk factors have become commonplace, not much research has focused on members of the civil service in Port Harcourt, a critical group in state management but still vulnerable to urban, industrial risk factors. Consequently, the present study aims to empirically ascertain the effect of age, cigarette smoking, and excessive alcohol consumption as risk factors for cardiovascular diseases among civil servants in Port Harcourt, Nigeria.

### Research Questions

The following research questions guided the study:

1. Will age be a cardiovascular health risk factor among civil servants in Port Harcourt metropolis, Nigeria?
2. Will cigarette smoking be a cardiovascular health risk factor among civil servants in Port Harcourt metropolis, Nigeria?
3. Will excessive alcohol intake be a cardiovascular health risk factor among civil servants in Port Harcourt metropolis, Nigeria?

### Research Hypotheses

The following null hypotheses were tested at 0.05 alpha level:

1. Age will not be a significant cardiovascular health risk factor among civil servants in Port Harcourt metropolis, Nigeria.
2. Cigarette smoking will not be a significant cardiovascular health risk factor among civil servants in Port Harcourt metropolis, Nigeria.
3. Excessive alcohol intake will not be a significant cardiovascular health risk factor among civil servants in Port Harcourt metropolis, Nigeria.

### Methodology

The descriptive survey research design was adopted for the study. It was considered appropriate because it encourages observation and description of existing phenomena: the current level of health risk behaviours and impact, without manipulating any variables (Ofo, 1994). It allows for an organized evaluation of the health condition of the population to proactively inform future decisions. The target population comprised civil servants working within the Port Harcourt metropolis. A systematic sampling technique was employed to select a total sample of 500 subjects, stratified into 250 junior and 250 senior civil servants. The selection process involved a multi-stage approach:

1. **Ministry Selection:** From the 22 ministries in the Rivers State Secretariat, ten (10) were selected using a simple random sampling technique (fishbowl method with replacement) to ensure an equal chance of selection.
2. **Subject Selection:** From each of the ten sampled ministries, 50 subjects (25 senior and 25 junior staff) were randomly selected.

Data were collected using a structured, self-constructed questionnaire titled "Cardiovascular Risk Factor Assessment Scale" (CRFAS). The instrument was divided into two sections:

- **Section A:** Solicited demographic data (age, sex, rank, weight).
- **Section B:** Contained close-ended items (Yes/No format) investigating the specific variables: age-related health changes, smoking habits, and alcohol consumption patterns.

Validity was established by experts in Human Kinetics and Health Education. Reliability was determined using the test-retest method, yielding a Pearson product-moment correlation coefficient of 0.78, indicating high reliability.

The researcher, assisted by trained research assistants, administered the questionnaire directly to respondents in the Ministries of Agriculture, Information, Justice, Finance, Women Affairs, Education, Health, Housing and Urban Development, Sports, and Environment. Out of the 500 copies distributed, 494 were correctly filled and retrieved, while 6 were discarded due to incomplete data. Descriptive statistics (frequency counts and percentages) were used to analyze demographic data. The inferential statistic of Chi-square ( $\chi^2$ ) was utilized to test the null hypotheses at the 0.05 level of significance using SPSS.

## Results

**Table 1: Demographic Characteristics of Respondents**

Demographic Statistics	Category	Numbers	Percentage (%)
Staff Rank	Junior	246	49.80
	Senior	248	50.20
Age	30 years or less	118	23.36
	31 – 40 years	150	30.36
	41 – 54 years	205	41.50
	55 years above	21	4.25
Sex	Female	210	42.51
	Male	284	57.49
Weight	Below 50kg	22	4.45
	50 – 59kg	112	22.67
	60 – 69kg	175	35.43
	70 – 79kg	148	29.96
	80kg above	37	7.49

Table 1 reveals a balanced distribution of staff, with 49.80% junior and 50.20% senior staff. A significant portion of the workforce (41.50%) is in the middle-aged bracket (41–54 years), a critical period for CVD onset. Males constituted 57.49% of the sample. Regarding body weight, a notable combined percentage (37.45%) weighed 70kg or above, suggesting a tendency toward overweight/obesity in the population.

## Hypothesis Testing

**Hypothesis 1:** Age will not be a significant cardiovascular health risk factor among civil servants in Port Harcourt metropolis, Nigeria.

**Table 2: Chi-square analysis on Age as a cardiovascular health risk factor.**

Age (years)	(O)	(E)	(O-E)	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E	X <sup>2</sup> cal.	X <sup>2</sup> crit	df
<30	118.00	98.80	19.20	368.64	3.73			
31- 40	150.00	98.80	51.20	2621.44	26.53	<b>144.42*</b>	<b>7.82</b>	<b>3</b>
41- 54	205.00	98.80	106.20	11278.44	114.15			
>55	21.00	98.80	-77.80	6052.84	61.26			

*N = 494, Alpha level = 0.05, Significant.*

Table 2 shows that the calculated Chi-square value (144.42) is significantly greater than the critical table value (7.82) at 3 degrees of freedom. Therefore, the null hypothesis is rejected. This confirms that age is a statistically significant cardiovascular health risk factor among the civil servants studied.

**Hypothesis 2:** Cigarette smoking will not be a significant cardiovascular health risk factor among civil servants in Port Harcourt metropolis, Nigeria.

**Table 3: Chi-square analysis on Cigarette Smoking as a cardiovascular health risk factor**

(O)	(E)	(O-E)	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E	X <sup>2</sup> cal.	X <sup>2</sup> crit	df
193.00	225.60	-32.60	1062.76	4.71			
301.00	268.40	32.60	1062.76	3.96			
303.00	225.60	77.40	5990.76	26.55			
191.00	268.40	-77.40	5990.76	22.32			
250.00	225.60	24.40	595.36	2.64	<b>83.26*</b>	<b>9.49</b>	<b>4</b>
244.00	268.40	-24.40	595.36	2.22			
200.00	225.40	25.60	655.36	2.90			
294.00	268.40	25.60	655.36	2.44			
182.00	225.60	-43.60	1900.96	8.43			
312.00	268.40	43.60	1900.96	7.08			

*N = 494, Alpha level = 0.05, Significant.*

Table 3 indicates that the calculated Chi-square value (83.26) exceeds the critical value (9.49) at 4 degrees of freedom. The null hypothesis is rejected, implying that cigarette smoking is a significant cardiovascular health risk factor in this population.

**Hypothesis 3:** Excessive alcohol intake will not be a significant cardiovascular health risk factor among civil servants in Port Harcourt metropolis, Nigeria.

**Table 4: Chi-square analysis on Excessive Alcohol Intake.**

(O)	(E)	(O-E)	(O-E) <sup>2</sup>	(O-E) <sup>2</sup> /E	X <sup>2</sup> cal.	X <sup>2</sup> crit	df
482.00	293.00	189.00	35721.00	121.91			
12.00	201.00	-189.00	35721.00	177.72			
394.00	293.00	101.00	10201.00	34.82			
100.00	201.00	-101.00	10201.00	50.75	<b>732.52*</b>	<b>9.49</b>	<b>4</b>
240.00	293.00	-53.00	2809.00	9.59			
254.00	201.00	53.00	2809.00	13.98			
247.00	293.00	-46.00	2116.00	7.22			
247.00	201.00	46.00	2116.00	10.53			
102.00	293.00	-191.00	36481.00	124.51			
392.00	201.00	191.00	36481.00	181.50			

*N = 494, Alpha level = 0.05, Significant.*

As depicted in Table 4, the calculated value of Chi-square (732.52) is much higher than the critical value of 9.49. There is a strong rejection of the null hypothesis. The excessive consumption of alcohol is a highly significant and very widespread cardiovascular health risk factor in the sample of civil servants surveyed.

## Discussion

Findings from the study present empirical evidence on the main determinants of cardiovascular health of civil servants in Port Harcourt. The result confirms the global and regional epidemiological consensus that age, smoking, and alcohol abuse are strong risk factor drivers of the CVD epidemic. Rejection of the first null hypothesis ( $\chi^2 = 144.42$ ) implies that age is an effective risk factor. This reflects the findings of Babatunde et al. (2020) and Tian et al. (2023), who

reported that age is an independent predictor of CVD risk in Nigeria. Aging, in biological terms, is characterized by a decline in arterial compliance and deposition of atherosclerotic plaque. The current study found that over 45% of respondents belonged to the age group of 41-55+. According to Aladeniyi et al. (2021), the threat of hypertension and stroke after 40 years is exponential, not linear, especially in civil servants whose jobs evolve into sedentary office work due to the length of their careers. The result of this is a “double burden” of biological aging and physical inactivity (Eshiet et al., 2024). Hypothesis 2 confirmed that cigarette smoking significantly predisposed to this condition ( $\chi^2 = 83.26$ ). Some studies suggest that there is a lower prevalence of smoking in Nigeria as opposed to Europe (Olawuyi & Adeoye, 2018); however, the cardiovascular effects on smokers is immense. Research by Banks et al. (2019) published in the journal “BMJ” found that, at any level, tobacco use is unsafe for the heart and blood vessels. The process includes both acute vasoconstriction and chronic endothelial inflammation. Also, Adeke et al. (2022) reported that smoking was clustered among Nigerian men with other risk factors, such as poor diet. Job-related stress among civil servants in Port Harcourt may enhance the nicotine dependence of civil servants. Therefore, smoking to relieve work stress will enhance the stress on the vascular system (Jeff, 2001; Ruan et al., 2018). The study’s most striking finding was that the alcohol intake had an exceedingly high statistical significance ( $\chi^2 = 732.52$ ). The high value suggests that drinking alcohol is a key lifestyle behaviour for this category of workers.

According to Maduka and Ojimah (2020) and Badego et al. (2020), the rate of alcohol use was particularly high among workers in Southern Nigeria. Recent studies reveal shortcomings in the reasoning behind the cardio-protective effects of moderate drinking. Biddinger et al. (2022) and Rana et al. (2015) demonstrate increased blood pressure and coronary artery disease due to moderate drinking. In Port Harcourt's social culture of drink consumption, coupled with the financial ability of senior civil servants to buy alcohol, is likely playing a role in this high risk. The “synergistic effect” is also important: Tsygankova et al. (2022) have shown that the combination of alcohol and tobacco multiplies CVD risk, which is much greater than the sum of separate risks. Data regarding weight shows that a large group, 37% of respondents, weigh 70kg or more, and this reveals clustering of risk factors. According to Jorgetto et al. (2025) and Zhang et al. (2020), it is rare for CVD risks to occur in isolation. The civil servant who is likely to be middle-aged, sedentary, consumes alcohol, and smoke is at high risk. The ‘clustering’ effect requires a comprehensive response, rather than an isolated response. (Al et al., 2016)

## Conclusion

In this study, it was found that age, cigarette smoking, and a large amount of alcohol are significant and harmful risk factors for the development of cardiovascular disease among civil servants in Port Harcourt, Nigeria. The remarkable strength of the statistical association found with alcohol use implies that this is likely a special behaviour that could be cultural or occupational. There is an urgent need to look into it. These risk factors don’t work alone; they interact to undermine the health of the workforce. In turn, this threatens the productivity and sustainability of Rivers State’s civil service.

## Recommendations

To mitigate these risks and ensure the longevity and productivity of the workforce, the following recommendations are proposed:

1. The Rivers State Civil Service Commission should institutionalize "Wellness Wednesdays" or similar programs that mandate physical exercise and limit hours spent in a sitting position. According to Eshiet et al. (2024), one must integrate health into their daily jobs or work.
2. In accordance with the findings of the study on substance abuse, the Federal Ministry of Health must label tobacco and alcohol products with health warnings on cardiovascular disease. Sales should be regulated, and “smoke-free” zones within government secretariats must be strictly enforced.
3. Government and non-governmental organizations (NGOs) should collaborate to provide free, biannual cardiovascular screenings (blood pressure, BMI, glucose, and lipid profiles) for all civil servants, specifically targeting those over 40 years of age.
4. Public health campaigns should specifically target the "myth" of alcohol as a stress reliever, educating civil servants on the direct link between alcohol, hypertension, and stroke.
5. To reduce occupational stress—a driver for smoking and drinking—the government should review labour practices to ensure adequate rest periods and discourage excessive overtime, allowing time for recreation and exercise.

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