

Evaluating Civil Servant's Awareness of Myocardial Infarction (MI): Prevention Strategies, Risk Factors, and Early Signs and Symptoms in Sokoto State, Nigeria

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Research Article

Keywords: Myocardial infarction, awareness, civil servants, Sokoto state, cardiovascular disease, Nigeria

Posted Date: June 19th, 2026

DOI: <https://doi.org/10.21203/rs.3.rs-9741881/v1>

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Additional Declarations: No competing interests reported.

Abstract

INTRODUCTION: Non-communicable diseases (NCDs) are rising globally, yet healthcare systems in settings like Sokoto State, Nigeria, remain constrained by severe resource shortages and underfunctional NCD units. This study assessed the awareness of risk factors, symptoms, and preventive strategies for myocardial infarction (MI) among civil servants in Sokoto State.

METHODOLOGY: A descriptive cross-sectional study was conducted among civil servants selected via consecutive sampling across four randomly selected ministries (Health, Agriculture, Works, and Animal Health). Data were collected between June 30 and July 5, 2025, using a pretested, structured, interviewer-administered questionnaire. Analysis was performed using IBM SPSS version 25, with statistical significance set at $p < 0.05$.

RESULT: Among the 73 participants (mean age 47.37 ± 10.68 years; 86.3% male), Self-reported comorbidities were highly prevalent; these included hypertension (34.2%), diabetes mellitus (34.2%), and chronic kidney disease (31.5%). Overall, 57.5% of respondents had poor-to-moderate composite knowledge of myocardial infarction (MI). Recognition of classic symptoms was critically low; only 24.7% recognized chest pain and 16.4% identified shortness of breath as warning signs. Furthermore, knowledge of preventive measures was profoundly deficient, as over 89% of participants rejected the preventive value of exercise and a balanced diet. Logistic regression analysis demonstrated that educational attainment was the sole independent predictor of good MI knowledge (AOR = 0.481, 95% CI: 0.273-0.848, $p = 0.011$).

CONCLUSION: Despite a high burden of cardiovascular comorbidities, MI awareness and preventive knowledge among civil servants are low. There is an urgent need for targeted workplace health education programs.

INTRODUCTION

Myocardial infarction (MI), commonly known as a heart attack, it is a significant contributor to the global burden of cardiovascular diseases (CVDs), which is among the leading causes of death globally. [1] Myocardial infarction prevalence varies considerably by age group worldwide. The prevalence is at 3.8% among people under 60 and 9.6% among those over 60. [2] Every year in Nigeria, there are 59.1 cases of acute coronary syndrome (ACS), which includes MI, for every 100,000 hospitalized individuals. The following is how ACS subtypes are distributed in Nigeria: 48.7% of cases are ST-segment-elevation myocardial infarction (STEMI), followed by non-ST-segment-elevation myocardial infarction (NSTEMI) (24.5%) and unstable angina (26.8%).[3] The development of MI is strongly linked to a combination of modifiable and non-modifiable risk factors. Key modifiable risk factors include unhealthy dietary patterns, physical inactivity, tobacco use, harmful alcohol consumption, and uncontrolled metabolic conditions such as hypertension, diabetes mellitus, dyslipidaemia, overweight, and obesity. Non-modifiable factors such as age, sex, and family history also contribute significantly to disease risk.

These risk factors often cluster within individuals and populations, accelerating atherosclerotic progression and increasing susceptibility to acute coronary events. [4]

Globally, the rising burden of CVDs has been driven by rapid socioeconomic transitions characterized by urbanization, globalization, and lifestyle changes that promote sedentary behaviour and high-calorie dietary intake.[5] In sub-Saharan Africa, including Nigeria, these transitions are occurring alongside persistent challenges such as poverty, psychosocial stress, and limited access to preventive healthcare services, thereby contributing to an increasing incidence of MI and other cardiovascular conditions.[6] Dietary shifts from traditional fibre-rich foods to energy-dense, processed diets further exacerbate the growing burden of noncommunicable diseases.[7]

Furthermore, cardiovascular diseases, including MI, constitute a major public health challenge in sub-Saharan Africa, where they are increasingly prevalent due to ongoing epidemiological transition.[8] These changes are driven by urbanization, globalization, and population ageing, as well as persistent structural challenges such as poverty and limited health system capacity.[8] The World Health Organization estimates that noncommunicable diseases account for 29% of all deaths in Nigeria, with CVDs contributing approximately 11%.[9]

Occupational and workplace-related factors play an important role in the development of cardiovascular diseases.[10] Sedentary work patterns, prolonged sitting, psychological stress, irregular physical activity, and unhealthy dietary habits associated with modern work environments have been linked to increased cardiovascular risk. [11, 12]

Civil servants, often facing stressful work environments and sedentary lifestyles, may be at increased risk. Cardiovascular diseases can differ greatly across certain groups of the population. Particular populations may be exposed differentially to risk factors, lack of access to health care, unhealthy lifestyles or may be disadvantaged in some ways.[13] The most important behavioural risk factors of MI are unhealthy diet, physical inactivity, tobacco use, family history and harmful use of alcohol.[13] The effects of behavioural risk factors may show up in individuals as raised blood pressure, raised blood glucose, raised blood lipids, and overweight and obesity.[13]

Early recognition of MI symptoms, including chest pain, shortness of breath, and profuse sweating, is critical for timely treatment and improved survival outcomes.[14] Similarly, awareness of preventive measures such as regular physical activity, healthy diet, smoking cessation, weight control, and adherence to medical therapy plays a central role in reducing disease burden.[5] However, studies across African populations consistently report suboptimal awareness of CVD risk factors, warning signs, and preventive strategies.[15]

Despite these findings, there remains a significant gap in evidence regarding civil servants in Sokoto State, a large and strategically important workforce group. There is limited information on their awareness of MI risk factors, symptoms, and prevention strategies, as well as a lack of structured cardiovascular health education and screening interventions targeting this population.

Therefore, this study aims to evaluate the awareness of myocardial infarction risk factors, early warning signs, and prevention strategies among civil servants in Sokoto State, Nigeria. Findings from this study will provide evidence to guide targeted health education and prevention programs, ultimately contributing to improved cardiovascular health outcomes and reduced disease burden in this population.

MATERIALS AND METHODS

Study Area

This survey was conducted among civil servants across Sokoto State, located in the northwestern zone of Nigeria. Sokoto State spans a landmass of 33,776.89 km² and has an estimated population of approximately 5.4 million inhabitants, based on projections from the 2006 census by the National Population Commission (NPC). The state is administratively divided into three senatorial zones (Sokoto East, Sokoto North, and Sokoto South), 23 Local Government Areas (LGAs), and 244 political wards. It is predominantly inhabited by the Hausa and Fulani ethnic groups, with the local economy relying heavily on agriculture (e.g., farming and livestock rearing), commerce, and public service, supplemented by internally generated revenue and federal government allocations. Sokoto State hosts over 800 health facilities, including tertiary institutions such as Usmanu Danfodiyo University Teaching Hospital (UDUTH), Federal Neuropsychiatric Hospital Kware, and the Specialist Hospital Sokoto, alongside 20 general hospitals, 50 primary health centers (PHCs), and numerous clinics, health posts, dispensaries, and private facilities. Despite these infrastructures, human resources for health remain grossly inadequate across all cadres, limiting effective healthcare delivery. The Sokoto State Ministry of Health has a unit responsible for non-communicable diseases (NCDs); however, this unit is not fully functional, contributing to gaps in NCD prevention and management.[16]

Civil servants, particularly those in urban settings like Sokoto metropolis, are a key workforce in the state, often exposed to sedentary lifestyles and occupational stress, which are risk factors for cardiovascular diseases (CVDs) such as myocardial infarction (MI). Sokoto's socio-economic context, with a significant proportion of its population engaged in public service, makes civil servants an ideal study population for assessing cardiovascular risk factors.

Study Population

The study population comprised all categories of staff aged 18 years and above, both male and female working in the selected ministries (Health, Agriculture, Works, and Animal Health), including administrative, technical, and support personnel. Participants of all cadres who were present during the data collection period and consented to participate were included in the study. Participants were permanent Civil servants of Sokoto State who have lived and worked in the area for at least one year to ensure relevance to the local context. Temporary workers (e.g., contract staff) were excluded to maintain homogeneity and focus on the target population.

Study Design

The study adopted a descriptive cross-sectional design to evaluate civil servant's awareness of myocardial infarction (MI) among staff of four ministries in Sokoto State, Nigeria. The focus was on assessing knowledge of prevention strategies, risk factors, and early symptoms associated with MI. Data collection was carried out between June 30, 2025 and July 5, 2025.

Structured, pre-tested questionnaires was administered to the civil servants that consented across the four selected ministries (Health, Agriculture, Works, and Animal Health) in Sokoto State. The data obtained was analyzed to determine the proportion of respondents who are aware of MI and its associated risk factors, prevention strategies, and symptoms.

Sample Size

No formal sample size calculation was performed. Recruitment continued until the total number of available and consenting staff across the four ministries was exhausted, representing a census of the accessible population.

Sampling Technique

A non-probability consecutive sampling technique was adopted. Prior to data collection, official permission was obtained from the Directors of Administration and Permanent Secretaries of each participating ministry. Following approval, announcements about the study were made to staff through internal communication channels.

The research team visited each ministry in person and met with staff from cadre to cadre and office to office, explaining the objectives of the study and inviting voluntary participation. All workers who provided informed consent were enrolled. The process continued until all willing staff members in each ministry had been approached, effectively achieving complete coverage of the accessible workforce.

Inclusion Criteria

- I. Only civil servants aged 18 years and above who are willing to participate in the study will be included.
- II. Civil servants currently employed in government ministries, departments, and agencies (MDAs) within Sokoto State.
- III. Individuals who have worked in the civil service for at least six months prior to the study (to ensure familiarity with the work environment).
- IV. Present at the workplace during the period of data collection.

Exclusion Criteria

- I. Civil servants who are on leave or unavailable during the data collection period will be excluded from the study.
- II. Contract staff, interns, or volunteers not formally employed as civil servants.
- III. Individuals with known medical or cognitive conditions that impair their ability to complete the questionnaire reliably.
- IV. Respondents who decline to participate or withdraw consent at any stage.

Data Collection

Data were collected using a structured interviewer-administered questionnaire developed based on a review of relevant literature and adapted to the local context. The structured, pretested questionnaire was used to collect data. The questionnaire consisted of four sections:

- Section 1: Socio-demographic characteristics: Age, gender, education level, marital status, and years of study.
- Section 2: Knowledge of MI, which included questions on knowledge of MI symptoms, risk factors and early signs, preventive strategies and lifestyle.

Ethical considerations

The study was conducted in accordance with the Declaration of Helsinki and National Code for Health Ethics of Nigeria.

The ethical approval was obtained from the Sokoto State Ministry of Health research ethics committee under the review number (SKHREC/029A/2025). Community entry was performed according to the states formal procedure through the appropriate Directors of administration. Informed consent was obtained from all the respondents.

Data analysis

Statistical Package for Social Sciences (SPSS) version 25 (SPSS Inc, Chicago, IL, IBM Version) was used for entry and analysis. Descriptive statistics including means, standard deviations, frequencies, and percentages were used to summarize participants' sociodemographic characteristics and study variables. Associations between categorical variables were assessed using the Chi-square test, while Pearson correlation analysis was used to determine relationships between continuous variables where applicable. Variables associated with the outcome of interest were further analyzed using binary logistic regression to identify independent predictors. Adjusted odds ratios (AORs) with corresponding 95% confidence intervals (CIs) were reported. The Hosmer–Lemeshow goodness-of-fit test was used to

assess model fitness, while the Nagelkerke R² statistic was used to determine the proportion of variance explained by the model. A p-value of less than 0.05 was considered statistically significant.

RESULTS

Sociodemographic Characteristics of Respondents

A total of 73 civil servants participated in the study. The mean age of respondents was 47.37 ± 10.68 years. Participants had an average of 15.88 ± 7.01 years of formal education and a mean monthly income of ~~₦~~78,465.88 $\pm$ ~~₦~~253,706.60. The mean number of adults per household of participants was 3.70 ± 1.04 (Table 1).

Also, as shown in Table 1, most respondents were male (63; 86.3%), while 10 (13.7%) were female. The majority were married (62; 84.9%), with smaller proportions being single (6; 8.2%), engaged (3; 4.1%), divorced (1; 1.4%), and widowed (1; 1.4%).

In terms of education, 4 (5.5%) had no formal education, 7 (9.6%) had completed primary school, 8 (11.0%) had secondary education, 42 (57.5%) had tertiary education, and 12 (16.4%) possessed higher degrees (Master or PhD). Ethnically, 58 (79.5%) were Hausa, 2 (2.7%) Yoruba, 2 (2.7%) Igbo, and 11 (15.1%) belonged to other ethnic groups.

Comorbid conditions were common: 25 (34.2%) reported hypertension, 25 (34.2%) diabetes mellitus, 21 (28.8%) dyslipidaemia, and 23 (31.5%) chronic kidney disease. Additionally, 21 (28.8%) had at least one family member diagnosed with cardiovascular or metabolic disease (CMD).

Table 1
Sociodemographic Characteristics of Respondents

Variables		Frequency (%)	
Mean Age (years) ± SD	47.37 ± 10.68		
Gender	Male	63 (86.3%)	
	Female	10 (13.7%)	
Marital Status	Single	6 (8.2%)	
	Engaged	3 (4.1%)	
	Married	62 (84.9%)	
	Divorced	1 (1.4%))	
	Widowed	1 (1.4%)	
Ethnicity	Hausa	58 (79.5%)	
	Yoruba	2 (2.7%)	
	Igbo	2 (2.7%)	
	Others	11 (15.1%)	
Educational level	No Formal Education	4 (5.5%)	
	Primary	7 (9.6%)	
	Secondary	8 (11%)	
	Tertiary education	42 (57.5%)	
	Higher Education (e.g. Master’s, PhD)	12 (16.4%)	
Total years spent in school ± SD	15.88 ± 7.01		
Mean Monthly income ± SD	78465.88 ± 253706.599		
Household size (Adults ≥ 18 years)	3.7 ± 1.04		
History of any Comorbid conditions	No conditions	25 (34.2%)	
	At least one condition	48 (65.8%)	
Comorbidities	Hypertension	Yes	25 (34.2%)
		No	48 (65.8%)
	Diabetes Mellitus	Yes	25 (34.2%)
		No	48 (65.8%)

Variables			Frequency (%)
	Dyslipidemia	Yes	21 (28.8%)
		No	52 (71.2%)
	Chronic Kidney Disease	Yes	23 (31.5%)
		No	50 (68.5%)
	Other	Yes	26 (35.6%)
		No	47 (64.4%)
Family History of CMD	Yes		21 (28.8%)
	No		52 (71.2%)

Awareness of Myocardial Infarction Symptoms and Risk Factors

Awareness of myocardial infarction (MI) symptoms and risk factors was generally low to moderate (Table 2). Only 18 (24.7%) correctly identified chest pain or discomfort as a likely symptom, while 47 (64.4%) considered it unlikely and 8 (11.0%) were unsure. Shortness of breath was recognized by just 12 (16.4%), while sweating (diaphoresis) was identified by 26 (35.6%). Awareness of nausea or vomiting (29; 39.7%) and dizziness or fainting (34; 46.6%) was somewhat better.

Recognition of other symptoms included pain in the upper abdomen (27; 37.0%), swelling in legs or ankles (33; 45.2%), frequent urination or thirst (30; 41.1%), and rapid or irregular heartbeat (32; 43.8%).

In terms of risk factors, high blood pressure was most frequently recognized (36; 49.3%), followed by diabetes (35; 47.9%), smoking (34; 46.6%), obesity (32; 43.8%), high cholesterol (29; 39.7%), unhealthy diet (39; 53.4%), sedentary lifestyle (47; 64.4%), and family history of MI (48; 65.8%).

These findings show that while respondents had some awareness of modifiable risk factors, recognition of classical warning symptoms such as chest pain and shortness of breath remained poor.

Table 2
Assessment of participants' awareness of Risk Factor and
Early Symptom Identification (n = 73)

Parameter		Frequency
Chest pain or discomfort	Likely	18 (24.7%)
	Unlikely	47 (64.4%)
	Not sure	8 (11.0%)
Shortness of breath	Likely	12 (16.4%)
	Unlikely	58 (79.5%)
	Not sure	3 (4.1%)
Sweating (diaphoresis)	Likely	26 (35.6%)
	Unlikely	44 (60.3%)
	Not sure	3 (4.1%)
Nausea or vomiting	Likely	29 (39.7%)
	Unlikely	34 (46.6%)
	Not sure	10 (13.7%)
Dizziness or fainting	Likely	34 (46.6%)
	Unlikely	22 (30.1%)
	Not sure	17 (23.3%)
Pain in the upper abdomen	Likely	27 (37.0%)
	Unlikely	25 (34.2%)
	Not sure	21 (28.8%)
Swelling in legs/ankles	Likely	33 (45.2%)
	Unlikely	20 (27.4%)
	Not sure	20 (27.4%)
Frequent urination/thirst	Likely	30 (41.1%)
	Unlikely	22 (30.1%)
	Not sure	21 (28.8%)
Rapid and irregular heart beat	Likely	32 (43.8%)
	Unlikely	26 (35.6%)

Parameter		Frequency
	Not sure	15 (20.5%)
Smoking	Likely	34 (46.6%)
	Unlikely	25 (34.2%)
	Not sure	14 (19.2%)
High blood pressure	Likely	36 (49.3%)
	Unlikely	14 (19.2%)
	Not sure	23 (31.5%)
Diabetes	Likely	35 (47.9%)
	Unlikely	19 (26.0%)
	Not sure	19 (26.0%)
High cholesterol	Likely	29 (39.7%)
	Unlikely	32 (43.8%)
	Not sure	12 (16.4%)
Obesity	Likely	32 (43.8%)
	Unlikely	32 (43.8%)
	Not sure	9 (12.3%)
Family history of MI	Likely	48 (65.8%)
	Unlikely	16 (21.9%)
	Not sure	9 (12.3%)
Sedentary lifestyle	Likely	47 (64.4%)
	Unlikely	13 (17.8%)
	Not sure	13 (17.8%)
Unhealthy diet	Likely	39 (53.4%)
	Unlikely	18 (24.7%)
	Not sure	16 (21.9%)

Awareness of Preventive Strategies

Regarding knowledge of prevention, only 5 (6.6%) respondents agreed that regular physical activity helps prevent MI, while 68 (89.5%) disagreed. Likewise, 2 (2.6%) believed that eating a balanced diet rich in

fruits and vegetables reduces MI risk, and 71 (93.4%) did not.

Only 6 (7.9%) recognized that avoiding smoking and alcohol could lower MI risk, while 67 (88.2%) disagreed. On the other hand, a larger proportion (57; 75.0%) disagreed with the false statement that managing stress has no effect on MI risk, showing partial understanding of stress as a risk factor.

The composite knowledge score had a maximum obtainable score of 59 points. Using a 70% cutoff point (≥ 42 points), participants were categorized as having good knowledge, while scores below 42 points were classified as poor/moderate knowledge. Overall, 31 (42.5%) participants demonstrated good knowledge of myocardial infarction, whereas 42 (57.5%) had poor/moderate knowledge.

Association Between Awareness and Sociodemographic Characteristics

Bivariate analysis (Table 3) revealed a significant association between educational level and MI awareness ($\chi^2 = 0.046, p < 0.05$). No significant associations were found with gender ($\chi^2 = 0.441$), marital status ($\chi^2 = 0.763$), ethnicity ($\chi^2 = 0.744$), or family history of cardiovascular disease ($\chi^2 = 0.483$).

Table 3
Awareness score in association with participant's categorical demographic characteristics

Parameter		Frequency (%)	Degree of Freedom (df)	χ^2
Gender	Male	63 (86.3%)	24	0.441
	Female	10 (13.7%)		
Marital Status	Single	6 (8.2%)	96	0.763
	Engaged	3 (4.1%)		
	Married	62 (84.9%)		
	Divorced	1 (1.4%))		
	Widowed	1 (1.4%)		
Educational level	No Formal Education	4 (5.5%)	96	0.046*
	Primary	7 (9.6%)		
	Secondary	8 (11%)		
	Tertiary education	42 (57.5%)		
	Higher Education (e.g. Master's, PhD)	12 (16.4%)		
Ethnic	Hausa	58 (79.5%)	72	0.744
	Yoruba	2 (2.7%)		
	Igbo	2 (2.7%)		
	Others	11 (15.1%)		
Family History of CMD	Yes	21 (28.8%)	24	0.483
	No	52 (71.2%)		

Cross-tabulation analysis between educational level and preventive knowledge (Figs. 1 & 2) revealed that awareness of preventive measures increased slightly with higher education but remained suboptimal across all groups. Only 4 (9.5%) of those with tertiary education and 1 (8.3%) with postgraduate degrees recognized regular physical activity as protective, while for dietary modification (eating fruits and vegetables), only 1 (8.3%) respondent with tertiary and 2 (4.8%) with higher education answered correctly. For avoiding smoking and alcohol, 2 respondents each among tertiary and postgraduate degree holders answered correctly. Regarding stress management, 5 with tertiary education and 4 with higher education correctly disagreed with the misconception that managing stress has no effect on MI risk.

No respondents with primary or secondary education showed awareness of these measures. Other sociodemographic factors; including gender, marital status, and ethnicity, had no significant association with knowledge of prevention.

Multivariable binary logistic regression analysis was subsequently performed to identify independent predictors of good knowledge of myocardial infarction among the participants. Educational level emerged as the only significant independent predictor of good knowledge of myocardial infarction (AOR = 0.481, 95% CI: 0.273–0.848, $p = 0.011$). Gender, marital status, ethnicity, and monthly income were not significantly associated with good knowledge of myocardial infarction ($p > 0.05$).

Male respondents had higher odds of good knowledge compared to females; however, this association was not statistically significant (AOR = 2.701, 95% CI: 0.522–13.977, $p = 0.236$). Similarly, marital status was not significantly associated with good knowledge (AOR = 0.935, 95% CI: 0.433–2.021, $p = 0.864$). Ethnicity also showed no statistically significant association with good knowledge of myocardial infarction despite higher odds observed among some ethnic categories. Monthly income was likewise not significantly associated with awareness level (AOR = 1.000, 95% CI: 1.000–1.000, $p = 0.715$).

The overall logistic regression model demonstrated acceptable fit characteristics. The model explained approximately 15.0% and 20.1% of the variance in good knowledge of myocardial infarction according to the Cox and Snell R^2 and Nagelkerke R^2 statistics, respectively. Additionally, the Hosmer–Lemeshow goodness-of-fit test indicated adequate model fit ($\chi^2 = 2.367$, $p = 0.968$). The model correctly classified 65.8% of the participants.

DISCUSSION

This study assessed awareness of myocardial infarction (MI), including recognition of symptoms, risk factors, and preventive strategies, among civil servants. Overall, the findings revealed generally low to moderate awareness of MI despite the relatively high educational attainment of most respondents. Although over half of the participants had tertiary education or higher qualifications, fewer than half demonstrated good overall knowledge of MI, highlighting persistent gaps in cardiovascular health literacy within the population.

Recognition of classical symptoms of myocardial infarction was particularly poor. Less than one-quarter of respondents correctly identified chest pain or discomfort as a likely symptom of MI, while awareness of shortness of breath was also markedly low. These findings are concerning, as chest pain and dyspnea are among the most commonly reported warning signs of acute myocardial infarction and are critical for early presentation and treatment seeking. Poor recognition of these symptoms may contribute to delays in hospital presentation and increased morbidity and mortality from cardiovascular events. Similarly, low levels of awareness of MI symptoms have been reported in several studies conducted in low- and middle-income countries, such as Tanzania [17] and other Sub-Saharan African countries [18], however contrasts with findings from studies in North central Nigeria [19] and Ghana [20], where awareness of these cardinal features was moderately higher among urban adults and healthcare workers. This

disparity may be attributed to differences in health education exposure and workplace wellness programs. The low level of symptom awareness in this study suggests that early presentation to health facilities during acute cardiac events may be delayed, contributing to poorer outcomes and higher mortality.

Although awareness of some associated symptoms such as dizziness, nausea, diaphoresis, and rapid heartbeat was relatively better, misconceptions remained common among respondents. A considerable proportion incorrectly identified symptoms such as leg swelling and frequent urination as manifestations of MI. This may reflect confusion between myocardial infarction and other chronic cardiovascular or metabolic conditions such as heart failure and diabetes mellitus. These findings suggest the need for targeted educational interventions focused on distinguishing acute MI symptoms from symptoms of other chronic diseases.

Awareness of modifiable risk factors such as hypertension (49.3%), diabetes (47.9%), smoking (46.6%), and obesity (43.8%) was moderate. These findings align partially with those of Okeahialam et al. [21] in Jos and Aminde et al [6] and Awah et al [22] in Cameroon, who reported fair knowledge of cardiovascular risk factors among working populations but low adoption of preventive behaviors; however, this contrasts with the report from Amadi et al [23] with good knowledge on the risk factors. This may be attributable to increasing public health messaging regarding lifestyle-related diseases and cardiovascular risk reduction. Nevertheless, awareness remained suboptimal overall, particularly for high cholesterol and obesity, which are well-established contributors to cardiovascular disease. The paradox of relatively high educational attainment yet poor cardiovascular knowledge observed here reflects a gap between academic literacy and health literacy. It reinforces the argument that educational qualification alone does not guarantee health awareness or healthy behavior unless accompanied by sustained public health communication. [24]

The coexistence of high prevalence of comorbid conditions such as hypertension, diabetes mellitus, dyslipidaemia, and chronic kidney disease among participants further emphasizes the importance of adequate cardiovascular health awareness in this population.

Knowledge of preventive measures was particularly poor: only 6.6% of respondents recognized regular physical activity as beneficial, 2.6% believed in the importance of a balanced diet, and 7.9% acknowledged the benefits of avoiding smoking and alcohol, when compared to a report from South-South Nigeria demonstrating good knowledge of preventive practices among members of a community [25]. This limited awareness suggests that although civil servants may have some understanding of cardiovascular risk factors, this knowledge rarely extends to practical actions that could reduce their risk of developing MI.

The finding that a majority of respondents did not associate simple lifestyle modifications with MI prevention indicates a major gap in preventive health literacy. Such a pattern may be related to low exposure to workplace or community health education programmes, minimal emphasis on

cardiovascular prevention in routine public health campaigns, or the perception that heart disease is a condition confined to older or affluent individuals.

The poor preventive knowledge observed even among respondents with tertiary or postgraduate education further emphasizes that formal education alone does not guarantee adequate understanding of disease prevention. This highlights the need for more targeted, behavior-oriented health education that focuses on actionable preventive practices rather than theoretical knowledge.

A notable finding from this study is the statistically significant relationship between educational level and general MI awareness [26] ($p = 0.046$), although this did not translate into better preventive knowledge. Different trends were reported by F Alves et al [27], who observed that individuals with higher education levels often overestimate their health knowledge yet underperform in adopting preventive behaviors. The weak or inverse correlation between years of schooling and awareness observed in this study suggests that civil servants' work-related stress, sedentary lifestyles, and lack of structured health promotion programs may negate the benefits of formal education.

The absence of gender, marital, and ethnic differences in awareness suggests that low MI literacy cuts across demographic boundaries. This uniformity indicates the need for population-wide cardiovascular education rather than interventions targeted at specific social groups. Implementing workplace-based cardiovascular health promotion, such as periodic screening, seminars, and behavioral counseling, could bridge this knowledge gap.

Overall, the findings reveal that while awareness of MI and its risk factors exist to some degree, knowledge of prevention remains grossly inadequate. Public health authorities should therefore integrate cardiovascular health education into civil service wellness programs and community health campaigns, focusing on behavior change communication.

Limitations of the Study

The main limitation of this study was the low level of participation among civil servants. Many potential respondents were either unavailable during the data collection period or showed limited interest in participating. This reduced the overall sample size and may have introduced selection bias, as those who took part might differ in health awareness from those who did not. Despite this limitation, the findings provide valuable insight into the pattern of knowledge and awareness of myocardial infarction among government employees in Sokoto State.

Declarations

Ethics approval and consent to participate

The ethical approval was obtained from the Sokoto State Ministry of Health research ethics committee under the review number (SKHREC/029A/2025). Informed consent was obtained from all participants

prior to participation in the study.

Accordance statement

The study was conducted in accordance with the Declaration of Helsinki and National Code for Health Ethics of Nigeria.

Consent for publication

Not applicable.

Funding

This research received no specific grant from any funding agency in the public, commercial, or not-for-profit sectors.

Clinical trial number

Clinical trial number: not applicable.

Declaration on the Use of Artificial Intelligence and Language Tools

During the preparation of this manuscript, the authors used ChatGPT and QuillBot to paraphrase existing text, correct grammatical errors, and improve the overall readability of the material. After using these tools, the authors reviewed, edited, and validated the final output, and take full responsibility for the accuracy and scientific integrity of the manuscript's content.

ACKNOWLEDGEMENTS

The authors would like to acknowledge the Directors of administration and permanent secretaries for their invaluable support, instrumental leadership, and pivotal role in engaging and encouraging the civil servants across the ministries to participate in this study.

DATA AVAILABILITY STATEMENT

All data supporting the findings of this study are included within the manuscript and its supplementary materials. Additional details on variables and statistical outputs are provided in the tables.

AUTHOR CONTRIBUTIONS

I.T.H: Conceptualization, methodology, resource provision, data curation, investigation/data collection, formal analysis, writing – original draft, and supervision.

A.J.B: Investigation/data collection, resource provision, writing – review and editing, and supervision.

A.Y: Data curation, investigation/data collection, resource provision, writing – review and editing, and editing of figures.

A.S.K: Investigation/data collection, writing – review and editing, and editing.

R.A.I: Methodology, investigation/data collection, writing – review and editing, and editing.

Z.B.U: Investigation/data collection, writing – review and editing, and editing.

T.O.O: Investigation/data collection, formal analysis, writing – review and editing, and editing.

F.L: Investigation/data collection, supervision, writing – review and editing, and editing.

F.B.A: Investigation/data collection, writing – review and editing, and editing.

A.I.M: Data curation, investigation/data collection, resource provision, writing – review and editing, and editing.

H.D.K: Investigation/data collection, writing – review and editing, and editing.

S.A.S.F: Data curation, investigation/data collection, resources, writing – review and editing, and editing.

A.K.H: Investigation/data collection, resource provision, writing – review and editing, and editing.

M.M: Investigation/data collection, writing – review and editing, and editing.

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Figures

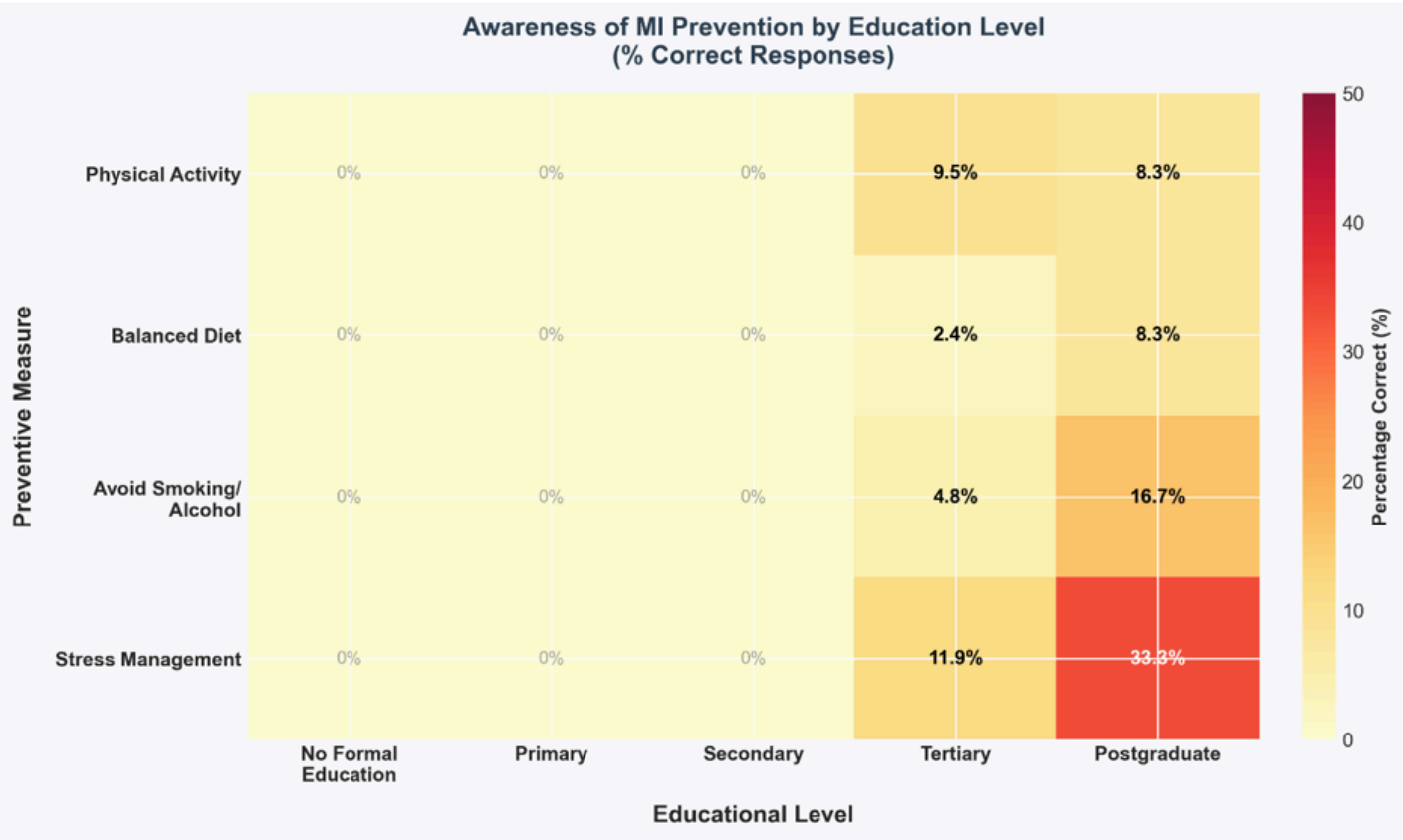


Figure 1

Awareness of MI Prevention by Educational level

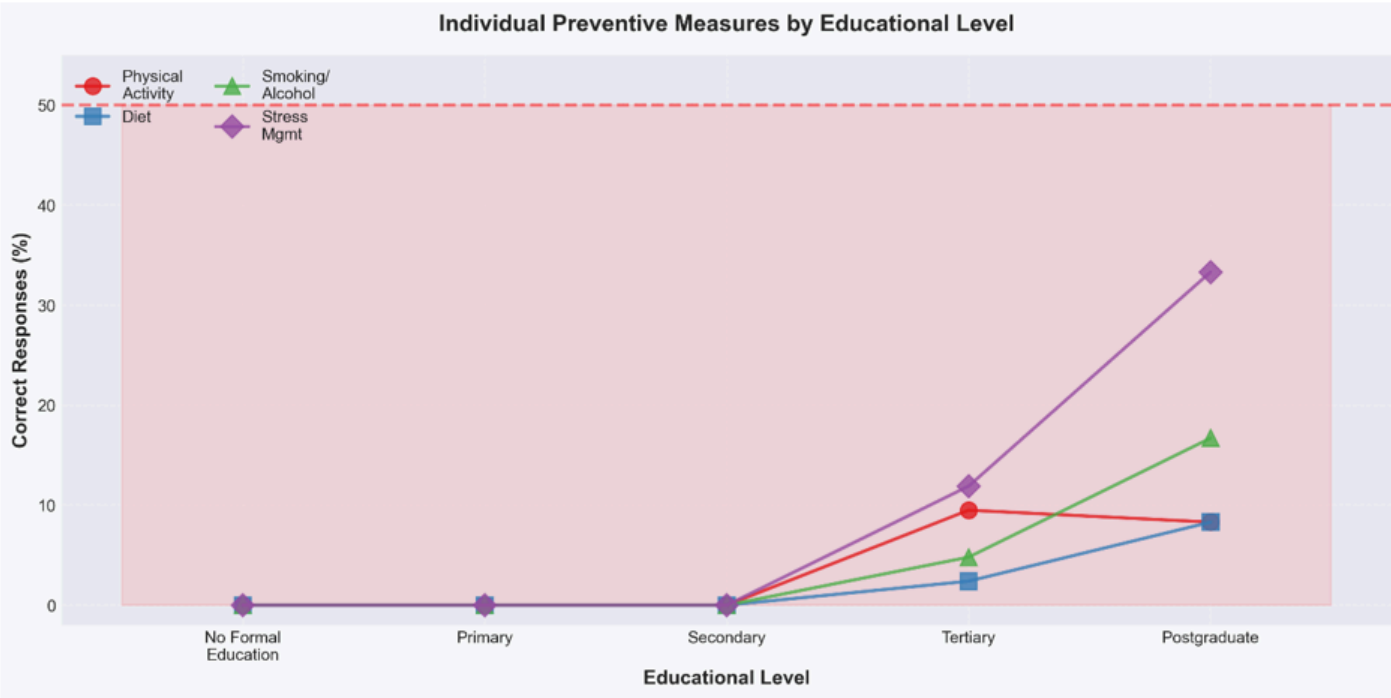


Figure 2

Awareness of MI Prevention by Educational level

