

Knowledge, Attitude and Perception of Cardiovascular Disease and Their Sociodemographic Determinants Among Primary Healthcare Workers in South-East Nigeria

Chinwendu Joe Felix

Faculty of Health Sciences,
Lincoln University College, Malaysia

Regidor III Poblete Dioso (Ph.D)

Faculty of Health Sciences,
Lincoln University College, Malaysia

Adeniyi Sarafadeen Diran (Ph.D)

Faculty of Business and Accounting,
Lincoln University College, Malaysia

Abstract

Background: Cardiovascular disease, of which hypertension is the leading driver, is escalating rapidly in Nigeria. Primary healthcare workers occupy a pivotal role in the prevention and early detection of cardiovascular conditions, but their effectiveness depends on their own knowledge, attitudes, and perceptions. A clearer understanding of these constructs, and of the sociodemographic factors that shape them, is needed to target continuing-education efforts.

Objective: This study assessed the knowledge, attitude, and perception of cardiovascular (heart) disease among primary healthcare workers in South-East Nigeria and examined the sociodemographic factors associated with these constructs.

Methods: A descriptive cross-sectional survey was conducted among 400 primary healthcare workers (physicians, nurses, pharmacists, and laboratory scientists/technologists) selected through multistage proportionate, stratified, and simple random sampling from Federal Medical Centres across the five South-East states. Data were gathered with a validated, self-administered structured questionnaire (Cronbach's $\alpha = 0.85$) and analysed in SPSS version 25 using frequencies, percentages, and chi-square tests, with significance set at $p < 0.05$.

Results: Overall, 288 (72.0%) of respondents demonstrated good knowledge of heart-related disease, 272 (68.0%) held a positive attitude, and 309 (77.3%) had good perception of health-related issues. Knowledge was significantly associated with gender ($\chi^2 = 4.993$, $p = 0.025$), tribe ($\chi^2 = 15.740$, $p < 0.001$), and marital status ($\chi^2 = 12.030$, $p = 0.007$), but not with age, religion, or occupation. Attitude was significantly associated with age ($\chi^2 = 8.404$, $p = 0.015$), gender ($\chi^2 = 4.349$, $p = 0.037$), tribe ($\chi^2 = 23.224$, $p < 0.001$), and marital status ($\chi^2 = 18.235$, $p < 0.001$). Perception showed no significant association with any sociodemographic variable.

Conclusion: Although most primary healthcare workers displayed good knowledge, attitude, and perception of cardiovascular disease, meaningful sociodemographic gaps persisted, particularly by gender, tribe, and marital status. Targeted, group-sensitive health-education programmes are recommended to close these gaps.

Keywords: *knowledge; attitude; perception; cardiovascular disease; primary healthcare workers; sociodemographic determinants; Nigeria*

Introduction

Cardiovascular disease is the leading cause of death in the world and hypertension is the leading modifiable risk factor for disease. Raised blood pressure is responsible for as many as 7.5 million deaths annually, according to the World Health Organization, with the number of adults with hypertension expected to rise to 1.56 billion by 2025. This burden is disproportionate and is highest in Sub-Saharan Africa where the prevalence of hypertension is estimated to be almost 30%, the highest in any World Health Organization region. Hypertension and its complications are reportedly a major cause of hospital admissions and medical emergencies in Nigeria, which is under increasing pressure from non-communicable diseases.

In this context, primary healthcare workers are well placed to impact on cardiovascular outcomes. They are often the first and sometimes the only interface between communities and the formal health system and they have primary responsibility for health promotion, screening for risk factors, early detection and referral. The knowledge, attitudes and practices of frontline health workers are thus crucial to the success of national non-communicable disease programmes. The knowledge, attitude and practice (KAP) assessment is a widely-used technique to determine the knowledge and skills deficits among providers, as well as barriers to the implementation of programmes.

Knowledge is defined as what health workers know about the causes, warning signs, risk factors and prevention of cardiovascular disease; attitude is the beliefs, dispositions and willingness to act on that knowledge; and perception is how health workers interpret and prioritise cardiovascular risk in themselves and in the individuals they serve. These constructs are mutually dependent; knowledge is necessary for the development of positive attitudes, which in turn influence perceptions and consequently, preventive and clinical behaviour. Any level of deficiency can compromise the quality of care and the effectiveness of health promotion, especially when health workers are expected to demonstrate healthy behaviours.

Importantly, knowledge, attitude and perception are not uniformly distributed among social groups. The sociodemographic characteristics (age, gender, ethnicity/tribal group, religion, marital status, and occupational cadre) may influence information exposure, the cultural context of illness, and receptivity to messages of prevention. These factors can lead to systematic

variation in health-related knowledge even among a trained health care workforce in multi-ethnic, multi-religious countries like Nigeria. Knowledge of the sociodemographic factors that correlate with higher or lower KAP can help guide continuing education efforts to where they are most needed, and not blanket.

The KAP framework has a long history in public-health research and is based on the assumption that behaviour change requires and is, to some extent, dependent on knowledge and attitudes. The connection among the three constructs is not linear or deterministic (knowledgeable people do not necessarily behave in a health-promoting way), but it is a useful diagnostic model for identifying where the process of health promotion fails. KAP assessment can be an effective and efficient tool to help identify if there is a lack of knowledge, negative attitudes, or misperceptions of risk causing gaps in care in the context of cardiovascular disease. This diagnostic value is also enhanced for health workers, who, through their own KAP, can not only impact their health but also the quality of counselling and screening provided to their patients.

Another factor peculiar to the Nigerian context is the high ethnic, religious and cultural diversity of the country. A variety of traditional, religious and biomedical systems of beliefs exist in Nigeria and sometimes compete with each other in shaping health beliefs. These background influences can also influence the understanding and prioritisation of cardiovascular risk even among formally trained health workers. A review of sociodemographic determinants of KAP is thus not only descriptive of disparities, but also offers insights into the cultural and social processes by which health knowledge is shaped, and into the levers through which this knowledge can be enhanced.

Although primary healthcare workers are a key target group, there is limited systematic evidence of the KAP of cardiovascular disease in Nigeria and even fewer studies have investigated the sociodemographic determinants of the KAP of cardiovascular disease in the South-East geopolitical zone. This study was therefore designed to assess the knowledge, attitude, and perception of cardiovascular disease among primary healthcare workers in South-East Nigeria and to determine the sociodemographic factors associated with each construct.

Objectives of the Study

The specific objectives were to: (i) assess the level of knowledge of cardiovascular (heart) disease among primary healthcare workers; (ii) evaluate their attitude towards heart-related health issues; (iii) determine their perception of cardiovascular risk and prevention; and (iv) examine the associations between sociodemographic characteristics and each of these three constructs.

Materials and Methods

Study Design and Setting

A descriptive cross-sectional survey design was employed to gather quantitative data from primary healthcare workers in Nigeria's South-East geopolitical zone, comprising Abia, Anambra, Ebonyi, Enugu, and Imo states. The design provides a representative snapshot of the population at a single point in time (Cohen, Manion, & Morrison, 2007) and permits inferential testing of associations between provider characteristics and KAP outcomes. Data were collected from Federal Medical Centres and affiliated primary healthcare facilities across the five states.

Population, Sample Size, and Sampling

The study population comprised primary healthcare workers in government hospitals across the zone, estimated at 14,866 personnel and classified, in line with World Health Organization conventions, into four categories: physicians (doctors), nurses and midwives (nurses), pharmaceutical personnel (pharmacists), and laboratory staff (laboratory technologists/scientists). The sample size of 400 was derived using Cochran's formula ($n = \frac{Z^2pq}{e^2}$, with $Z = 1.96$, $p = q = 0.5$, $e = 0.05$), giving 384.16 and rounded up to 400. A multistage sampling procedure combining proportionate, stratified, and simple random sampling was used: the workforce was stratified by occupational category and participants were drawn proportionately from each stratum, yielding 125 physicians, 131 nurses, 57 pharmacists, and 87 laboratory scientists/technologists.

Instrument, Validity, and Reliability

Data were collected with a researcher-developed, self-administered structured questionnaire covering respondents' sociodemographic characteristics and their knowledge, attitude, and perception of cardiovascular disease. Face and content validity were established by three specialists in public health and three additional experts in hypertension and related conditions. Reliability was assessed in a pilot study of 30 primary healthcare workers, yielding a Cronbach's alpha of 0.85, which indicates good internal consistency. Composite KAP scores were dichotomised into "good" and "poor" categories for analysis.

Data Collection and Analysis

Questionnaires were administered over a two-week period with the assistance of three trained research assistants; respondents were allowed one to two days to complete the instrument. Completed data were analysed using SPSS version 25. Frequencies and percentages summarised responses, and the chi-square statistic was used to test associations between sociodemographic characteristics and each KAP construct. Statistical significance was set at $p < 0.05$.

Ethical Considerations

Ethical approval was obtained from the Research Ethics Review Committees of the participating Federal Medical Centres. Written informed consent was secured from all participants, participation was voluntary, and confidentiality was preserved through the use of numeric codes rather than names.

Results

All 400 administered questionnaires were completed and returned, giving a 100% response rate.

Sociodemographic Profile

The sample was predominantly female (265; 66.3%) and concentrated in the 26–35-year age group (262; 65.5%). Most respondents were Christian (307; 76.8%), of Yoruba (290; 72.5%) or Igbo (89; 22.3%) ethnicity, and either married (193; 48.3%) or single (168; 42.0%). Laboratory personnel formed the largest occupational group (188; 47.0%), followed by pharmacists (122; 30.5%), doctors (72; 18.0%), and nurses (18; 4.5%).

Table 1. Sociodemographic characteristics of respondents (N = 400)

Variable	Category	Frequency	Percent
Age (years)	18–25	80	20.0
	26–35	262	65.5
	35–49	58	14.5
Gender	Male	135	33.8
	Female	265	66.3
Religion	Christianity	307	76.8
	Islam	93	23.3
Tribe	Yoruba	290	72.5
	Igbo	89	22.3
	Hausa	21	5.3
Marital status	Married	193	48.3
	Single	168	42.0
	Widowed	18	4.5
	Separated	21	5.3
Occupation	Medical doctor	72	18.0
	Nurse	18	4.5
	Laboratory scientist	188	47.0
	Pharmacist	122	30.5

Knowledge of Cardiovascular Disease

Respondents demonstrated broadly sound knowledge of cardiovascular disease. When asked to identify the nature of heart disease in women, 194 (48.5%) described it as a heart-related

problem, 94 (23.5%) equated it with hypertension, and 58 (14.5%) referred to disease affecting the heart. Regarding causes, 169 (42.3%) correctly identified heredity and lifestyle as contributory, while smaller proportions cited stress, fatty foods, and combinations of these factors. Knowledge of heart attack was particularly strong, with 246 (61.5%) recognising it as a sudden cessation of cardiac function, and a further 61 (15.3%) describing it as heart failure. In terms of screening behaviour, 160 (40.0%) had checked their blood pressure within the previous one to six months and 103 (25.8%) within the previous one to three weeks, while 158 (39.5%) monitored their blood sugar monthly and 137 (34.3%) every six months. These self-reported monitoring patterns indicate reasonably active engagement with personal cardiovascular surveillance, though a minority reported never checking their blood pressure or blood sugar. Overall, 288 (72.0%) of respondents were classified as having good knowledge of health-related disease, and 112 (28.0%) as having poor knowledge (Table 2).

Table 2. Respondents' familiarity with selected health-related topics

Item	Category	Freq.	%
Nature of heart disease	Heart-related problem	194	48.5
	Hypertension	94	23.5
Causes of heart disease	Heredity and lifestyle	169	42.3
Knowledge of heart attack	Abrupt heart halt	246	61.5
Last BP assessment	1–6 months ago	160	40.0
Blood sugar check	Once a month	158	39.5
Overall knowledge	Good	288	72.0
	Poor	112	28.0

Sociodemographic Determinants of Knowledge

Chi-square analysis (Table 3) revealed statistically significant associations between overall knowledge of health-related issues and respondents' gender ($\chi^2 = 4.993$, $df = 1$, $p = 0.025$), tribe ($\chi^2 = 15.740$, $df = 2$, $p < 0.001$), and marital status ($\chi^2 = 12.030$, $df = 3$, $p = 0.007$). Male

respondents were proportionally more likely to demonstrate good knowledge (37.0% of the good-knowledge group) than expected, and Yoruba respondents showed higher knowledge than Igbo respondents. Age ($\chi^2 = 0.122$, $p = 0.941$), religion ($\chi^2 = 0.046$, $p = 0.831$), and occupation ($\chi^2 = 4.551$, $p = 0.208$) were not significantly associated with knowledge.

Table 3. Association between sociodemographic characteristics and knowledge

Variable	χ^2	df	p-value
Age	0.122	2	0.941
Gender	4.993	1	0.025*
Religion	0.046	1	0.831
Tribe	15.740	2	0.000*
Marital status	12.030	3	0.007*
Occupation	4.551	3	0.208

Note. *Significant at $p < 0.05$.

Attitude Towards Cardiovascular Disease

Respondents' attitudes towards heart-related health issues were largely positive. Most (283; 70.8%) identified maintaining a healthy lifestyle as the principal strategy for preventing heart disease, and 170 (42.5%) affirmed that nutrition influences the progression of coronary heart disease. When asked how they would respond to a suspected heart attack, respondents were distributed across rushing to hospital (81; 20.3%), calling for help (76; 19.0%), and applying first aid (72; 18.0%), although 80 (20.0%) reported having no idea how to respond—an important gap in emergency-response readiness. Overall, 272 (68.0%) of respondents held a positive attitude and 128 (32.0%) a negative attitude towards health-related issues.

Table 4. Respondents' attitudes towards heart-related issues

Item	Category	Freq.	%
Heart-disease prevention	Healthy lifestyle	283	70.8
Nutrition affects progression	Yes	170	42.5

Item	Category	Freq.	%
First response to heart attack	Rush to hospital	81	20.3
	No idea	80	20.0
Overall attitude	Positive	272	68.0
	Negative	128	32.0

Sociodemographic Determinants of Attitude

Attitude was significantly associated with several sociodemographic characteristics (Table 5). Age ($\chi^2 = 8.404$, $df = 2$, $p = 0.015$), gender ($\chi^2 = 4.349$, $df = 1$, $p = 0.037$), tribe ($\chi^2 = 23.224$, $df = 2$, $p < 0.001$), and marital status ($\chi^2 = 18.235$, $df = 3$, $p < 0.001$) all showed significant associations with overall attitude. Younger respondents and Yoruba respondents tended to hold more positive attitudes, while separated respondents and those of Hausa ethnicity were more likely to hold negative attitudes. Religion ($\chi^2 = 3.375$, $p = 0.066$) and occupation ($\chi^2 = 5.386$, $p = 0.146$) were not significantly associated with attitude.

Table 5. Association between sociodemographic characteristics and attitude

Variable	χ^2	df	p-value
Age	8.404	2	0.015*
Gender	4.349	1	0.037*
Religion	3.375	1	0.066
Tribe	23.224	2	0.000*
Marital status	18.235	3	0.000*
Occupation	5.386	3	0.146

Note. *Significant at $p < 0.05$.

Perception of Cardiovascular Disease

Perception of health-related issues was generally favourable, with 309 (77.3%) of respondents classified as having good perception and 91 (22.8%) as having poor perception. When asked how heart-disease risk could be reduced, 200 (50.0%) identified moderate exercise, 54 (13.5%) cited a balanced diet, and smaller proportions mentioned limiting alcohol, medical check-ups, and smoking cessation. Notably, however, none of the sociodemographic variables was significantly associated with perception. Chi-square tests for age ($\chi^2 = 1.583$, $p = 0.453$), gender ($\chi^2 = 1.685$, $p = 0.194$), religion ($\chi^2 = 0.688$, $p = 0.407$), tribe ($\chi^2 = 0.871$, $p = 0.647$), marital status ($\chi^2 = 1.811$, $p = 0.612$), and occupation ($\chi^2 = 3.930$, $p = 0.269$) were all non-significant (Table 6).

Table 6: Association between sociodemographic characteristics and perception

Variable	χ^2	df	p-value
Age	1.583	2	0.453
Gender	1.685	1	0.194
Religion	0.688	1	0.407
Tribe	0.871	2	0.647
Marital status	1.811	3	0.612
Occupation	3.930	3	0.269

Note. No sociodemographic variable was significantly associated with perception (all $p > 0.05$).

Discussion

This study aimed at evaluating the knowledge, attitude and perception of cardiovascular disease (CVD) among primary healthcare workers in South-East Nigeria and to explore their socio-demographic determinants. The overall result is good – most respondents showed good knowledge (72.0%), positive attitude (68.0%) and good perception (77.3%) – but there was a significant difference between sociodemographic groups in terms of knowledge and attitude, although there was no significant difference in perception.

Knowledge and Its Determinants

The fact that about two thirds of the respondents were well informed about the cause, the warning signs and prevention of cardiovascular disease is consistent with their professional training and is also in line with previous studies of health workers including Akintunde, Akintunde and Opadijo (2015) who reported broadly adequate but uneven knowledge of heart-disease risk factors among Nigerian university workers. There is significant awareness of the nature of a heart attack as an abrupt stoppage of the heart's function, and of the importance of genes and lifestyle as risk factors; showing that core biomedical concepts are well entrenched in this workforce.

The highly significant relationship between Knowledge and gender, tribe and marital status needs to be investigated further. A gender gap (with male respondents being over-represented in the good-knowledge group) could indicate a difference in exposure to CPD, professional status or information-seeking behaviour and indicates that perhaps female staff (which make up the majority of this group) may benefit from targeted knowledge strengthening. The difference between the tribes probably reflects cultural differences in the way illness is framed and communicated, and in the differential availability of health information in ethnic communities. This relationship to marital status could be mediated by the social networks and family health experiences that married and previously married people build up, which could increase their awareness of chronic disease. The lack of a strong relationship with occupation is interesting and indicates that formal cadre is not as good a predictor of knowledge as are more general social factors – an important reminder that doctors and nurses do not necessarily have greater knowledge than laboratory or pharmacy workers.

Attitude and Its Determinants

The generally positive attitude towards cardiovascular health - including the high level of endorsement of healthy lifestyles and the understanding that nutrition can affect the progression of the disease, is a positive starting point for health promotion. Yet the fact that one in five respondents said they didn't know what to do in the event of a suspected heart attack shows a major lack in everyday attitude and emergency skills. This gap is clinically relevant because delay in responding to acute cardiac events or an inadequate response can be deadly.

Attitude was even more widely patterned across sociodemographic factors than was knowledge, and was associated with age, gender, tribe and marital status. The age effect (younger respondents' more positive attitudes) may be due to generational changes in health consciousness and in the exposure to current health messages, which younger professionals are likely to be more responsive to, than older professionals. A strong tribal association ($\chi^2 = 23.224$, $p < 0.001$) supports the importance of the cultural context in influencing health dispositions and strongly suggests culturally specific health-education strategies over universal messages. The higher prevalence of less favourable attitudes among separated respondents might reflect the psychosocial stress associated with separation on health attitudes, as separation and associated stress have been shown to be associated with higher blood pressure in the general hypertension literature, and with lower uptake of preventive health behaviour.

It is important to note the gender gap in attitude. While there were more women than men in the sample, the proportion of male respondents was higher than that of females in terms of positive attitudes. This is similar to the gender trend with knowledge and indicates a consistent (albeit small) gender gap in cardiovascular health engagement in this workforce. The gender gap in knowledge and attitude should be a priority in the workforce health-promotion strategy, since women are responsible for a significant proportion of clinical care, and women are at increased anthropometric risk.

Perception and the Absence of Sociodemographic Effects

There was a clear trend in perception: it was generally good, but not significantly related to any sociodemographic variable. The uniformity is of theoretical interest. It indicates that while knowledge and attitudes are influenced by social status, perception of cardiovascular risk in this professionally trained group might be determined more by their shared exposure at work and clinical experience than by their background. Even distribution of perception means that perception-focused interventions can be conducted in the same manner for everyone in the workforce, while group differentiation should be used for knowledge- and attitude-focused interventions.

When the three constructs are compared, a coherent picture emerges. Knowledge and attitude, the two constructs most directly associated with information exposure and cultural framing, were

both socially patterned, while perception was not, which may reflect the fact that it may be more related to direct clinical experience, shared across the workforce. This continuum of patterned attitude to patterned knowledge to unpatterned perception can be a helpful guide to designing interventions: the more patterned the attitude/knowledge, the more differentiated the intervention needs to be; the less patterned the attitude/knowledge, the more uniform the intervention can be. This is more informative to read the constructs together like this than to consider any one of them alone.

The results are also consistent with the international evidence. Similarly, it has been found that the level of public awareness of cardiovascular risk factors is generally good but varies across social groups, as in the Kuwait study by Awad and Al-Nafisi (2014), and Claassen et al. (2012) found that perception of cardiovascular risk is not only socially stratified but is also influenced by other factors than demographic classification, such as personal and familial risk experience. These findings corroborate the results of the current study, and place the South-East Nigerian workforce in the wider context of the global landscape of inequitable cardiovascular health literacy.

Implications for Practice and Policy

Overall, the results contribute to a differentiated CPD approach. Knowledge strengthening should focus on female staff, specific ethnic groups and marital status groups who have been identified as having lower knowledge, and attitude strengthening interventions, such as emergency-response training, should be integrated throughout staff and targeted towards older and separated staff. As occupation was not a major determinant of knowledge or attitude, training should be extended to all cadres including laboratory and pharmacy personnel who are sometimes neglected in the training of cardiovascular. If these periodic KAP assessments are institutionalised, facilities can keep track of the progress and allocate the educational resources where the gaps are the greatest.

The findings are not only relevant to the individual facility, but also to national non-communicable disease policy. Nigeria's strategy to address the growing burden of cardiovascular diseases relies on the technical capacity and personal buy-in of the frontline health workforce into the preventive agenda. The results of the gaps found in this study indicate that pre-service

teacher education and in-service teacher education should focus more on practical, scenario-based skills and competencies rather than knowledge only, particularly in the case of the fifth of respondents who were unaware how to respond to a suspected heart attack. The generally positive attitudes identified in this study would be better supported by embedding short, frequent, refresher courses on emergency response for the cardiovascular system in the ongoing professional development of practitioners and by tying professional relicensing to such courses. These interventions, provided in a way that is sensitive to the demographic trends found in this report, provide a realistic path to enhancing the capacity of the primary healthcare workforce to prevent.

Strengths and Limitations

The study had a high number of participants, a complete response rate, a validated instrument and probability-based sampling for all four cadres. The limitations include the use of self-reported KAP, which could be subject to social-desirability bias; the construction of composite scores and their dichotomisation which is a simple but compresses the variation; and the fact that the findings are limited to federal facilities and therefore may not be applicable to state and private institutions. A cross-sectional design also does not allow for causal direction or change over time to be determined.

Conclusion

There was good knowledge, positive attitude and good perception of cardiovascular disease among most of the Primary healthcare workers in South-East Nigeria. However, there were significant sociodemographic differences in knowledge (gender, tribe and marital status) and in attitude (age, gender, tribe and marital status) indicating that these strengths are not uniformly distributed, whereas perception did not show any differences between the groups. Based on these findings, there is need for targeted, culturally and demographically sensitive health-education programmes, especially the competence in emergency response and for all occupational cadres to be reached. Frontline health workers' KAP is a cost-effective tool to enhance cardiovascular prevention system-wide.

Recommendations

It is recommended that: (i) continuing-education programmes on cardiovascular disease be tailored to the groups identified as having lower knowledge and less favourable attitudes, especially female, younger, and ethnically and maritally defined subgroups; (ii) structured emergency-response and first-aid training be mandated for all cadres to close the readiness gap; (iii) Federal Medical Centres and health authorities institutionalise periodic KAP surveys to monitor and target provider competence; and (iv) health-education content be delivered in culturally appropriate formats that account for the ethnic and social diversity of the workforce.

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