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Full Length Research Paper

Awareness and prevalence of risk factors of coronary heart disease among teachers and bankers in Sokoto, Nigeria

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Abstract

Coronary heart disease (CHD) was previously considered to be rare in sub-Saharan Africa, but its prevalence is on the increase mainly because of the increasing prevalence of its risk factors, linked to trends in urbanization and changes in lifestyle. This study sought to assess the awareness and prevalence of risk factors of coronary heart disease in Sokoto, Nigeria. A comparative cross sectional study was conducted among 110 bankers and 110 secondary school teachers selected by multistage sampling technique in August 2011. Anthropometric measurements, blood pressure measurement, and estimation of fasting blood sugar and cholesterol were done for the participants, together with questionnaire administration. Up to 50% awareness was reported in only 4 of 7 and 1 of 7 CHD risk factors among bankers and teachers respectively. Prevalence of CHD risk factors was high in both groups as follows; hypertension (teachers 33.3%, bankers 22.9%), diabetes mellitus (teachers 9.5%, bankers 8.5%), obesity (teachers 30.5%, bankers 20%), hypercholesterolemia (teachers 37.1%, bankers 41.9%), sedentary lifestyle (teachers 5.7%, bankers 33.3%) and smoking (teachers 4.8%, bankers 7.6%). This study demonstrated poor awareness and high prevalence of CHD risk factors among bankers and teachers in Sokoto. Public health education and promotion of healthy lifestyles are suggested to reduce this burden.

Keywords: Coronary heart disease, risk factors, awareness, prevalence, health education

INTRODUCTION

Coronary heart disease (CHD) was previously considered to be rare in sub-Saharan Africa, but its prevalence is on the increase and now ranks 8th among the leading causes of deaths in men and women in the region (Steyn et al., 2005). While communicable diseases account for the highest proportion of deaths in all persons and in those aged 15 to 59 years, importantly, in people aged 60 years and above, CHD is already the leading cause of deaths in men and the second leading cause of deaths in women in the African region (Dean et al., 2006). The World Health Organization (WHO) estimated that in 2005, CHD caused approximately 361,000 deaths in the African region, and current projections suggest that this number will nearly double by 2030. More recent projections of mortality and burden of disease suggest that by 2030, CHD will become the leading cause of death in low-income countries, contributing 13.4% of total deaths, versus 13.2% from HIV/AIDS. In addition, CHD is projected to rank fifth among the 10 leading causes of disability-adjusted life years (DALYs) in low-income countries by 2030 (WHO, 2006).

In the past few decades significant changes have occurred in the pattern of health and disease in many developing countries, including Nigeria. As malnutrition and communicable diseases are being controlled, with resultant increase in life expectancy, together with the

impact of urbanization and industrialization, chronic, non communicable conditions have begun to emerge as a dominant public health problem in the country. Recent reports show a high prevalence of the risk factors of CHD in Nigeria. In 2008, the prevalence of hypertension in Nigeria was estimated at 42.8%, diabetes mellitus was estimated at 8.5%, obesity was estimated at 6.5%, raised cholesterol was estimated at 16.1%, current daily smoking of tobacco was estimated at 4.6%, while the cardiovascular diseases (CVDs) accounted for an estimated 12% of all deaths in Nigeria (WHO, 2011).

Bankers and teachers constitute important productive sectors of the economy; they also represent the elite population in most communities in Nigeria. A study conducted among teachers (lecturers) and other members of staff in a university community in Ile-Ife, Nigeria reported low knowledge of CHD and high prevalence of its risk factors (Erhum et al., 2005). Another study among bankers in Ilorin, Nigeria show high prevalence of CHD risk factors (Jogunola et al., 2010).

The successful development and implementation of a health promotion program, depends upon identification of the scope and breadth of baseline knowledge among the targeted group members, as regional differences in knowledge may exist (Strolla et al., 2006). Similarly, reports from studies (Shakaib et al., 2005; Bertoni et al., 2005) have pointed out the existence of ethnic differences in hypertension and cardiovascular diseases. It is therefore necessary to determine the burden of CHD risk factors, especially among groups at risk in our locality. This study sought to assess the awareness and prevalence of risk factors of coronary heart disease among bankers and teachers in Sokoto.

METHODOLOGY

Study design and population

This was a comparative cross sectional study among bankers and secondary school teachers in Sokoto metropolis, the capital of Sokoto state, Nigeria in August 2011. Those that have worked for one year and above in the core banking and teaching profession were considered eligible. The minimum sample size was estimated at 104, and adjusted to 110 to compensate for non-response (with an anticipated 95% response rate) using the formula for comparing two proportions (Wang et al., 2006).

$$n = \frac{(Z_\alpha + Z_\beta)^2 \times [P1\,(1 - P1) + P2(1 - P2)]}{(P1 - P2)^2}$$

The level of significance was set at 5% ($\alpha = 0.05$), and a power of 80%.

Where: n = minimum sample size per group. Z_α= standard normal deviate corresponding to the probability of making type I error (α) at 5% = 1.96. Z_β = standard normal deviate corresponding to the probability of making type II error (β) of 20%, (i.e.100% – power of 80%) = 0.84. P1 = prevalence of hypertension among bankers = 31.0% in a previous study (Shivaramakrishna et al., 2010). P2 = prevalence of hypertension among teachers = 15.1% in a previous study (Greiw et al., 2010).

The eligible participants were selected by multistage sampling technique. At the first stage 10 of 41 banks and 10 of 45 secondary schools in the study area were selected as study centers by simple random sampling using the ballot option. At the second stage, selection of study participants in each of the selected banks and secondary schools was done by systematic sampling technique using the staff list in the banks and schools to constitute the sampling frame. Proportionate allocation (based on staff population) was applied in the selection of study participants in the selected banks and schools.

Data collection

The methods of data collection comprised of personal interview, physical and biochemical assessments. A standardized semi-structured, interviewer-administered questionnaire was used to obtain information on the socio-demographic characteristics of the study participants, awareness of coronary heart disease and its risk factors and behavioral measurements. The questions on awareness of CHD risk factors were adapted from the American Heart Association's questionnaire that was used for a national survey on knowledge of heart disease among women (Mosca et al., 2004). The questions on behavioural measurements were adapted from the WHO STEPS Instrument for chronic diseases risk factors surveillance that was used for a national survey on health behaviour monitor among Nigerian adult population (NHF/FMoH, 2003). The instruments were pre-tested in a pilot study among 7 bankers and 10 teachers in one of the banks and schools not selected for the study, the necessary adjustment was effected based on the observations made during the pre-test.

Weight was measured with shoes off to the nearest 0.5kg using a seca optimal scale; it was validated with a standard weight and corrected for zero error. Height was measured without shoes to the nearest 0.5cm using a stadiometer. Blood pressure was measured using a sphygmomanometer (Dekamet MG3, England) and stethoscope (Littman quality) with all tight clothing and other similar materials removed from the arm and in the sitting position. The first measurement was taken after the participant had rested for at least 10 minutes in a sitting position with the arm rested on a table such that the middle of the forearm was about the level of the heart. The second measurement was taken at the end of the interview; the mean of the 2 readings was used in the analysis. Acucheck glucometer was used for blood sugar analysis; capillary whole blood was obtained from the participants early in the morning after an overnight fast.

Rayto RT-9200 semi-auto chemistry analyzer (spectrophotometer) was used for analysis of fasting serum total cholesterol.

Three medical officers, two nurses and two laboratory scientists assisted in data collection after pre-training on the objectives, selection of participants and use of survey instruments. Ethical permission to carry out the study was obtained from the Ethical committee of the Usmanu Danfodiyo University Teaching Hospital Sokoto. Permission to carry out the study in the schools was sought and obtained from Sokoto State Ministry of Education and Ministry of Science and Technology; likewise the Management of the banks. Informed written consent was obtained from the participants before data collection.

Operational definition of terms

Body mass index (BMI) was calculated as weight (kg) divided by height^2 (m^2) and used as marker for overweight and obesity (Tsigos et al., 2008). Underweight was defined as BMI less than 18.5kg/m^2, normal weight was defined as BMI of 18.5 to 24.9kg/m^2, overweight was defined as BMI of 25.0 to 29.9kg/m^2, while obesity was defined as BMI of 30.0kg/m^2 and above. Diabetes mellitus was defined using the WHO criteria (WHO, 1999) as fasting plasma whole glucose $\geq$ 6.1mmol/l (110mg/dl). Hypercholesterolaemia was defined using the American Heart Association criteria (AHA, 2002) as fasting serum Total cholesterol (Tc) $\geq$ 5.2mmol/l (200mg/dl). Hypertension was defined using the World Health Organization and International Society of Hypertension criteria (WHO and ISH, 2003) as systolic blood pressure (SBP) $\geq$ 140mmHg and/or diastolic blood pressure (DBP) $\geq$ 90mmHg or both or self reported antihypertensive medication during the past 1 week.

Data analysis

Data was analyzed using the SPSS version 17 computer statistical software package. Frequency distribution tables were constructed; cross tabulations were done to examine relationship between categorical variables. The Chi-square test was used to compare differences between proportions. The independent student's t-test was used for comparison of mean differences between the two groups. Logistic regression analysis was used to determine the variables that predict the risk factors of CHD. All statistical analysis was set at 5% level of significance (i.e. $p < 0.05$).

RESULTS

Only 105 of the 110 participants in each group had useable questionnaires. The age of the teachers ranged from 25 to 56 years, while the age of the bankers ranged from 20 to 49 years. The teachers were statistically significantly older (Mean = 36.58; SD = 7.70) than the bankers (Mean = 31.31; SD = 6.18); $t = 5.466$, $p < 0.001$. A larger proportion of the teachers, 45.7% were in the 30-39 years age group while majority of the bankers, 46.7% were in the 20-29 years age group. The bankers had larger proportion of males (75.2%) than the teachers (59.0%). While most of the teachers (76.2%) were married, majority (50.5%) of the bankers were single. Islam was the predominant religion among the teachers (77.1%), while the bankers were predominantly Christians (59.0%). Even though most of the teachers (67.6%), and the bankers (58.1%), had university education, a high proportion (40%) of the bankers had polytechnic education, while a significant proportion (24.8%) of the teachers graduated from the college of education (Table 1).

Awareness of risk factors of coronary heart disease by participants

Equal proportion, 76.2% of bankers and teachers have ever heard of coronary heart disease. The television was the most common source of information about the disease among the teachers (53.8%), and the bankers (43.8%). Newspaper/ magazines and books were the second most common source of information among both the teachers (21.3%), and the bankers (27.5%). Only very few of the teachers (7.5%), and the bankers (13.8%), got information about CHD from the health workers.

Up to 50% awareness was reported in only 4 of 7 and 1 of 7 CHD risk factors among bankers and teachers respectively. Hypertension was known to 59.0% of bankers and 50.5% of teachers, also 55.2% of bankers and 47.6% of teachers knew overweight/obesity as risk factors of CHD.

While lack of physical activity, cigarette smoking and consumption of foods containing too much fat were known to up to half of the bankers as risk factors of CHD, it was not so among the teachers. Only a few of the participants in both groups knew advancement in age and diabetes mellitus as risk factors of CHD (Table 2).

Prevalence of risk factors of coronary heart disease among participants

Figure 1 shows the prevalence of the risk factors of coronary heart disease among the participants. Hypertension was more prevalence among teachers (33.4%) than bankers (22.9%), but the difference was not statistically significant ($x^2 = 1.950$, $p = 0.107$). In logistic regression models, the variables that predicted hypertension were; overweight/obesity (OR = 2.5, 95% CI

Table 1. Socio-demographic profile of participants

VARIABLE	TEACHERS N= 105 (%)	BANKERS N=105 (%)	p- value
AGE (in years)			
Minimum	25	20	t = 5.466
Maximum	56	49	p < 0.001
Mean	36.58	31.31	
Standard deviation	7.70	6.18	
AGE GROUPS (in years)			
20 - 29	22 (21.0)	49 (46.7)	x^2= 25.567
30 - 39	48 (45.7)	46 (43.8)	p < 0.001
40 - 49	29 (27.6)	10 (9.5)	
50 – 59	6 (5.7)	0 (0)	
SEX			
Male	62 (59.0)	79 (75.2)	x^2= 6.238
Female	43 (41.0)	26 (24.8)	p= 0.013
MARITAL STATUS			
Single	23 (21.9)	53 (50.5)	x^2= 3.525
Married	80 (76.2)	51 (48.6)	p= 0.060
Separated	0 (0)	1 (0.9)	
Widowed	2 (1.9)	0 (0)	
RELIGION			
Islam	81 (77.1)	43 (41.0)	x^2= 28.436
Christianity	24 (22.9)	62 (59.0)	p < 0.001
EDUCATIONAL STATUS			
College of Education	26 (24.8)	2 (1.9)	x^2= 44.449
Polytechnic	8 (7.6)	42 (40.0)	p < 0.001
University	71 (67.6)	61 (58.1)	

Table 2. Awareness of risk factors of coronary heart disease by participants

RISK FACTORS OF CHD	Response	TEACHERS N= 105 (%)	BANKERS N= 105 (%)	p- value
As age increases	Yes	38 (36.2)	36 (34.3)	x^2= 1.582
	No	9 (8.6)	19 (18.1)	p= 0.663
	Don't know	58 (55.2)	50 (47.6)	
Lack of physical activity	Yes	44 (42.3)	61 (58.1)	x^2= 6.322
	No	8 (7.7)	3 (2.9)	p= 0.042
	Don't know	52 (50.0)	41 (39)	
Overweight/ Obesity	Yes	50 (47.6)	58 (55.2)	x^2= 1.476
	No	5 (4.8)	3 (2.9)	p= 0.478
	Don't know	50 (47.6)	44 (41.9)	
Smoking tobacco (cigarette)	Yes	48 (45.7)	55 (52.4)	x^2= 3.083
	No	4 (3.80	8 (7.6)	p= 0.214
	Don't know	53 (50.5)	42 (40.0)	
Hypertension	Yes	53 (50.5)	62 (59.0)	x^2= 2.015
	No	2 (1.9)	3 (2.9)	p= 0.365
	Don't know	50 (47.6)	40 (38.1)	
Diabetes mellitus	Yes	33 (31.4)	45 (42.9)	x^2= 3.505
	No	6 (5.7)	3 (2.9)	p= 0.173
	Don't know	66 (62.9)	57 (54.3)	
Eating foods containing too much fat	Yes	47 (44.8)	51 (48.6)	x^2= 0.331
	No	7 (6.7)	6 (5.7)	p= 0.847
	Don't know	51 (48.6)	48 (45.70	

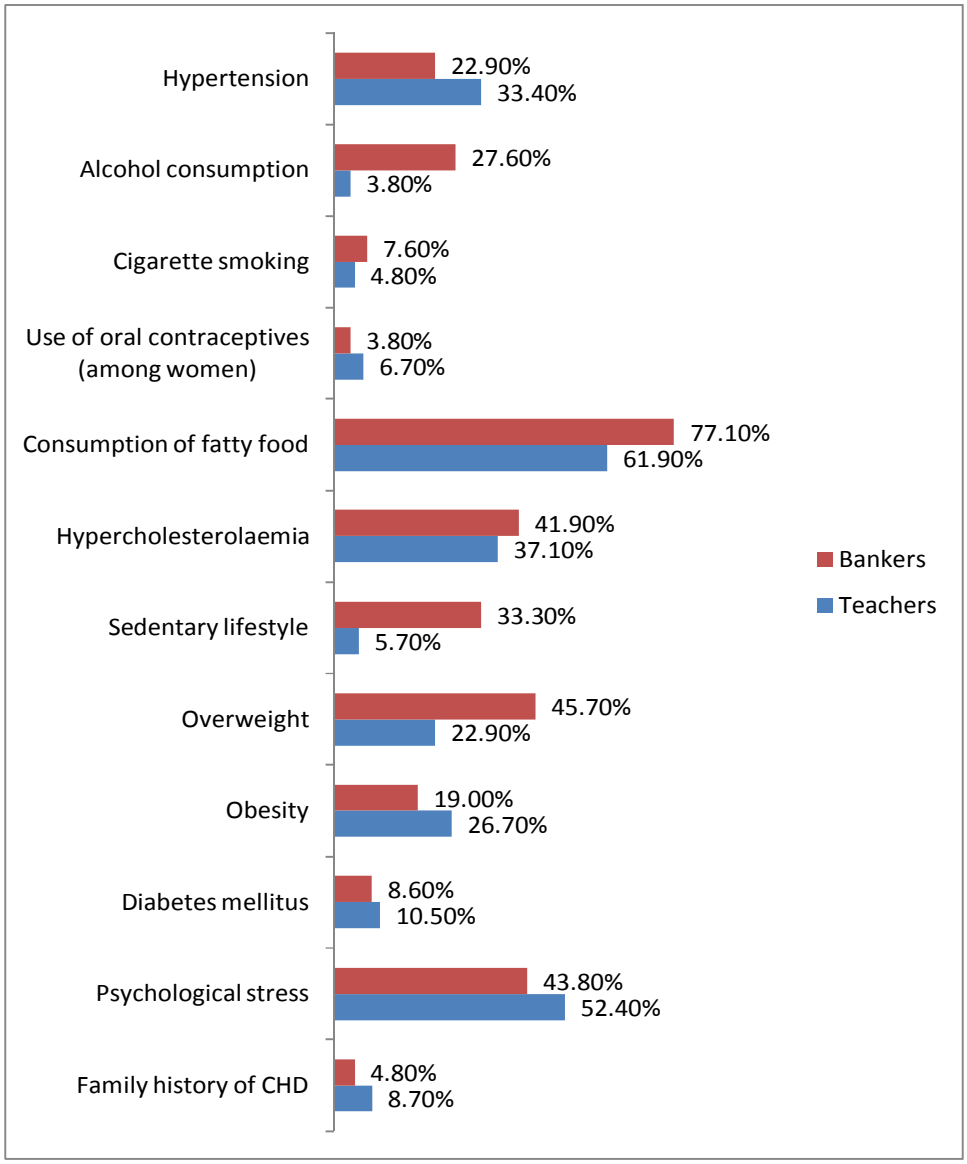

Figure 1. Prevalence of risk factors of coronary heart disease among participants

= 0.018 – 0.153), age (OR = 2.3, 95% CI = 0.001 – 0.018), and diabetes mellitus (OR = 2.3, 95% CI = 0.060 – 0.468).

Alcohol consumption within the past 30 days was more prevalent among bankers (27.6%) than teachers (3.8%), but only a few, 7.6% of bankers and 4.8% of teachers currently smoke cigarette. In both groups none of the females currently smoke cigarette. Also, only a few, 6.7% of the women among teachers, and 3.8% of the women among bankers use oral contraceptives.

Consumption of fatty foods was more prevalent among bankers (77.1%), than teachers (61.9%), and the difference was found to be statistically significant (x^2 = 5.753, p = 0.012). Hypercholesterolaemia was also more prevalent among bankers (41.9%), than teachers (37.1%), but the difference was not statistically significant (x^2 = 0.49, p = 0.286).

Sedentary lifestyle (by virtue of; use of motor cycle or car to work, lack of moderate physical activity at work, and lack of moderate leisure exercise) was about 6 times more prevalent among bankers (33.3%) than teachers (5.7%). Likewise, overweight was more prevalent among bankers (45.7%) than teachers (22.9%), but obesity was more prevalent among teachers (26.7%), than bankers (19.0%).

Diabetes mellitus was slightly more prevalent among teachers (10.5%) than bankers (8.6%). In logistic regression models, the only variable that predicted

diabetes mellitus was hypertension (OR = 2.6, 95% CI = 0.027 – 0.209).

More teachers (52.4%), than bankers (43.8%), considered themselves to be psychologically stressed by the circumstances that surround them at work or home. Also more teachers (8.7%), than bankers (4.8%), reported loss of any of parents, brother or sister as a result of sudden death from CHD.

DISCUSSION

The teachers were older than the bankers; a mean age of 36.6 + 7.7 years among the teachers in this study is similar to that obtained in a study by Sani et al. (2010) where the mean age was 37.6 $\pm$ 10.6 years. While most of the teachers were married (76.2%) and had a high proportion of females (males 59%, females 41%), the bankers were largely single (50.5%) and dominated by males (males 75.2%, females 21.9%).The work schedule in the banking profession that involves resuming at work very early in the morning (7.30am), and closing very late at night (at times up to 10pm), appears not to be compatible with advanced age and the domestic responsibilities of married women, unlike the teaching profession where the schools close at 3.30pm.

Most (76.2%), of the participants in both groups have ever heard of coronary heart disease. The television was the most common source of information among both the teachers (53.8%) and bankers (43.8%), followed by newspaper/magazines and books. Only very few of the teachers (7.5%) and bankers (13.8%) got information about CHD from health workers. The findings in this study compares well with the findings in a study among teachers in Bahrain (Attia et al., 2004) in which the common sources of information reported were; television (61%), magazines (39%), newspapers (34%), radio (22.2%), books (28.1%), hospitals (28.6%) and primary healthcare centers (15.7%). Access to the mass media in an urban community like Sokoto, could be the reason for the television and newspapers/magazines emerging as the most common sources of information in this study. Although a fair proportion of the bankers were aware of CHD risk factors such as hypertension (59.0%), lack of physical activity (58.1%), overweight/obesity (55.2%) and smoking (52.4%), it is much lower than the high level of awareness of CHD risk factors such as smoking (97.0%), sedentary lifestyle (91.0%) and overweight (94.0%) reported in a study among bankers in India (Ganesh-Kumar et al., 2013). Awareness of CHD risk factors was very poor among the teachers, the only risk factor known to a significant proportion among them was hypertension (50.5%), less than half (42.3%), knew lack of physical exercise, 47.6% knew overweight/obesity and 45.7% knew smoking as risk factors of CHD. The findings in this study are similar to the findings in a study among secondary school teachers in Oyo state, Nigeria (Familoni et al., 2011) that reported inadequate knowledge of CHD risk factors.

Hypertension was more prevalent among teachers (33.3%), than bankers (22.9%), this could be related to the fact that the teachers were older and had higher prevalence of other co-morbid conditions such as obesity and diabetes mellitus. Similar to the findings in this study in which, age, overweight/obesity and diabetes mellitus were the variable that predicted hypertension, a study among teachers in a university community by Erhun et al. (2005) also reported significant increase in the prevalence of hypertension with body mass index (BMI) and age.

Alcohol consumption was more prevalent among bankers (27.6%), than teachers (3.8%). The high prevalence of alcohol consumption observed among the bankers in this study is in concordance with that obtained by Puepet et al. (2008) in a study in Jos that reported a high prevalence of alcohol consumption (50%), and could be related to the fact that most of them were Christians, and probably recently transferred from the southern part of the country where the Sharia (Islamic) law that prohibit public sales and consumption of alcohol does not exist.

The prevalence of cigarette smoking was higher among bankers (7.6%) than teachers (4.8%). The very low prevalence of smoking among the teachers could be related to the low prevalence of alcohol consumption among them. In a study in South Africa (Schneider et al., 2009) it was reported that substance use disorders (such as alcohol consumption and smoking) were related and co-morbid.

Consumption of fatty foods was more prevalent among bankers (77.1%) than teachers (61.9%). Similarly, the prevalence of hypercholesterolaemia was slightly higher among bankers (41.9%) than teachers (37.1%). The high prevalence of hypercholestroleamia obtained in this study is alarming and much higher than the prevalence of 9.6% reported by Yekeen et al. (2003) in a study among hypertensive patients in Ibadan, Nigeria.

Physical inactivity (sedentary lifestyle) was six times more prevalent among bankers (33.3%) than teachers (5.7%), this is similar to the high prevalence of sedentary lifestyle (29.6%) reported in a study among bankers in Ilorin, Nigeria (Jogunola et al., 2010). While overweight was twice as prevalent among bankers (45.7%) than teachers (22.9%), obesity was more prevalent among teachers (26.7%) compared to bankers (19.0%). The high obesity rates obtained in this study is gradually approaching the obesity rates of 33.0% in males and 36.0% in females that was reported in a study by Ogden et al. (2006) among adults in the United States.

The proliferation of fast food outlets in Sokoto metropolis in recent years, following the reforms in the banking sector, probably resulted in increased consumption of energy-dense foods. This could have contributed to the high prevalence of obesity observed in this study.

The prevalence of diabetes mellitus was 10.5% among teachers and 8.6% among bankers. This could be related to the more advanced age of the teachers and higher prevalence of hypertension and obesity among them. Predictors of diabetes mellitus in this study included hypertension (OR = 7.3, p = 0.007), and age (OR = 4.8, p = 0.028). The values obtained in this study are higher than the prevalence of 6.3% reported by Amoah et al. (2002) in a study among adults in an urban community in Accra, Ghana.

CONCLUSION

This study demonstrated poor awareness and high prevalence of CHD risk factors among bankers and teachers in Sokoto. Public health education and promotion of healthy lifestyles are suggested to reduce this burden.

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