



Knowledge and Compliance with Preventive Measures of Cardiovascular Diseases among Health Workers in the University of Port Harcourt Teaching Hospital, Port Harcourt

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Authors' contributions

This work was carried out in collaboration among all authors. All authors read and approved the final manuscript.

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ABSTRACT

Introduction: This analytic descriptive study investigated knowledge and compliance with prevention measures of cardiovascular diseases among health workers in University of Port Harcourt Teaching Hospital, Port Harcourt.

Methodology: A sample of 608 health workers drawn from a population of 2500 health workers in University of Port Harcourt Teaching Hospital using simple random sampling technique participated in the study. Eleven research questions were answered and six hypotheses tested in the study. The instrument for data collection is Cardiovascular Disease Questionnaire. It was

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vetted by the supervisor and three other experts in health education. The reliability of the instrument established through pilot testing using Cronbach alpha method ranged from 0.67 to 0.89.

Results: The results of the study revealed that; Health workers in University of Port Harcourt Teaching Hospital have knowledge of cardiovascular diseases, their signs and symptoms, have knowledge of general risk factors for developing cardiovascular disease, have knowledge of smoking, diet, stress and physical inactivity as risk factors for developing cardiovascular diseases. There is no compliance with cardiovascular disease prevention measures among health workers in University of Port Harcourt Teaching Hospital. Gender and age have no influence on compliance with cardiovascular disease prevention measures while professional qualification influences compliance with cardiovascular disease prevention measures.

Conclusion: It was therefore recommended among others that health workers in University of Port Harcourt Teaching Hospital should check on regular basis their blood pressure, sugar and lipid level. They should show preference to healthy diets including fruits and vegetables and engage in periodic physical exercise.

Keywords: Knowledge; compliance; inactivity; diet; cardiovascular.

1. INTRODUCTION

Cardiovascular disease (s) has been described and defined by many institutions, organizations and health specialists, including the World Health Organization (WHO), Australian Heart Foundation (AHF), Nigerian Cardiac Society (NCS) and American Heart Association (AHA). The WHO [1] defined cardiovascular diseases as a group of disorders of the heart while the AHF [2] and AHA [3] defined it as all diseases and conditions involving the heart and blood vessels and a group of non-communicable diseases that include: hypertension, heart failure, peripheral vascular diseases, ischemic heart diseases, congenital heart diseases, arrhythmia among others respectively.

According to the WHO [1] cardiovascular diseases (CVDs) accounted for about 17.7 million deaths in 2015, representing 31% of all global deaths, with over three-quarters of such deaths occurring in low and middle income countries, while 7.4 million of the deaths were due to coronary heart diseases and 6.7 million were due to stroke and CVD ranking first as the disease-associated cause of death globally. The diseases in this complex have been observed to be associated with risk factors which are implicated in either the aetiology or exacerbate the pathogenesis. The most common risk factor of CVD morbidity/mortality is systemic hypertension, and accounts for 7.1million deaths globally. This has been buttressed by the American Heart Association [3], which opined that uncontrolled or undetected hypertension puts one at greater risk for the development of life-changing and potentially life-threatening

conditions such as stroke, kidney disease or failure, heart failure, loss of vision and sexual dysfunction among others.

The global observations are not different from the observations by investigators within the African continent and Nigeria, in particularly. Seedat [4] asserts that in Sub-Sahara Africa (SSA) in 2010, hypertension was the leading cause of death, increasing 67% of all deaths since 1990 and remains so globally till today [5]. However, it is on record that 90% of cardiovascular diseases are preventable. Nwafor and Alikor [6] also reported the high prevalence of CVDs among patients admitted in a Nigerian tertiary health facility.

Cardiovascular diseases are mainly due to interactions between genetic and environmental factors for an extended period of time [7], while the World Heart Federation [8] grouping the risk factors into two; modifiable and non-modifiable, with the former capable of being modified, treated and controlled through medication or lifestyle modification, as is tenable in tobacco smoking, high blood pressure, obesity and overweight, and the later not being modified and associated with age, gender, race and family history. This is in tandem with the observations of the American Heart Association [3] which recognized the major risk factor as cigarette smoking, elevated blood pressure, advancing age and diabetes mellitus. Other predisposing factors are obesity, physical inactivity and family history.

According to Michael [9], compliance is when one obeys a rule, agreement or demand. Seedat [10] suggested that low compliance is the main

reason for poor control of blood pressure. He defined compliance as the extent to which a person's behaviour coincides with medical or health advice, and this includes; taking medication, keeping health-related appointments and making lifestyle changes for diet, alcohol intake, smoking cessation and physical exercise). However, there are some factors that may be responsible for the non-compliance of people to health issues some of which are poverty, lack of knowledge, lack of accessibility to health facilities and factors associated with time. Compliance is crucial to preventing diseases and other negative tendencies of life.

Knowledge is the information, skills and understanding that you have gained through learning or experience Mayor [11]. Knowledge mainly comes by education and information. On this premise, it is pertinent for people to have knowledge about the risk factors that can predispose them to developing CVDs, as it will be easier to comply to those factors and prevent it. Knowledge is the belief that is true and justified. It relies on measurement of methods that solely correct to answers. Being incorrect is interpreted as knowing or not knowing something. The concept of knowledge has garnered several interests in recent years [12]. Knowledge, according to Will [4] is of different types, and includes; apriori (prior, from before, before experience or from earlier), posterior (later or after experience), explicit (recorded and communicated through mediums), tacit (through experience), propositional (knowing that something is true, similar to apriori and explicit knowledge) and non-propositional (knowing something, usually by doing).

The symptoms of CVDs are pains or pressure in the chest, pain or discomfort in the arms, shortness of breath (dyspnea), light-headedness or fainting and cold sweat. In the same vein, the treatment of CVDs, which is similar for both men and women [13], is multi-faceted and multi-disciplinary. Broadly, this includes; lifestyle changes, medicine, medical and capsular procedures and cardio-rehabilitations. However, one major challenge of preventing or treating CVDs is non-adherence to recommended protocol [4]. This is mainly due to beliefs, concern about potential adverse effects of long term use of the drugs and fear of drug dependence. This is in addition to lack of education of the importance to adhere to prescribed medication and protocols.

Health workers are people engaged in actions whose primary intent is to enhance health [14]. Globally, workers in health systems continue to experience increasing stress and insecurity, due to the complex array of forces associated with their profession [15]. For health workers to function effectively and maximally in their profession, they have to remain healthy and strong. Recent events have shown, though, that many health workers are developing cardiovascular problems and some have died suddenly. These were attributed to stress and poor lifestyle associated with their choice of career and this hinders their optimal performance. Health workers in the University of Port Harcourt Teaching Hospital (UPTH) are not an exception in this regard. One of such documented incidents was when a hospital assistant on night duty dropped dead while on duty last year in 2016 and another report of a Chief Nursing Officer dropping dead after returning from work, in the same year [16]. Similar incidents have also been reported in the Cardiology clinic at UPTH, in which, at least eight health workers attend the clinic on a weekly basis, including medical personnel retirees [17], with others suffering other forms of debilitating cardiovascular diseases, thus, prompting this study to determine the factors responsible for this trend and investigate the knowledge and compliance with preventive measures of cardiovascular disease among the health workers in the health facility. Specifically, the study considered the:

1. Knowledge of CVDs preventive measure among health workers in UPTH.
2. Compliance to avoidance of excessive alcohol as CVDs preventive measure among health workers in UPTH.
3. Compliance with moderate stress as CVDs preventive measure among health workers in UPTH.
4. Compliance with healthy diet as CVDs preventive measure among health workers in UPTH.
5. Compliance with avoidance of smoking as CVDs preventive measure among health workers in UPTH.
6. Compliance with avoidance of physical inactivity as CVDs preventive measure among health workers in UPTH.
7. Influence of gender, age and profession on knowledge of CVDs preventive measure among health workers in UPTH.

8. Influence of gender, age and profession on compliance to CVDs preventive measure among health workers in UPTH.

In other to achieve the aim of the study, two educational models were employed; the precede model (deals with human behaviour and what necessitates such behaviour) and the Health-Belief model, proposed by Achalu [18], with their respective constructs and variables.

2. METHODOLOGY

The study was carried out in the UPTH, a tertiary-care health facility, Rivers State, Niger Delta region of Nigeria. The facility, apart from treating patients, also teaches medical and paramedical students and personnel, and conducts medical-oriented researches at both undergraduate and graduate levels. A descriptive survey design was adopted for this study; because it is not amendable to variable manipulation [19]. The target population was the estimated 2500 health workers in the University of Port Harcourt Teaching Hospital, while the 400 respondents were recruited, using the Yaro-Yamene Formula. The respondents were stratified into doctors, nurses, laboratory scientists, pharmacists and social health workers, with random selection employed in each stratum.

The instrument for data collection is a structured questionnaire, which was in two sections; A and B. Section A had information on demographic characteristics, while B elicited information on health workers' knowledge of cardiovascular disease using true and false response options and modified Likert scale. Similarly, permissions for the study was obtained from the Department of Human Kinetics and Health Education and the Ethical Units of the School of Graduate Studies and Legal Unit of the University of Port Harcourt and University of Port Harcourt teaching Hospital respectively, while Consent was obtained from the participants.

Completed questionnaires were collected, coded and analysed. Descriptive and Inferential statistics was used to analyse sections A and B respectively, and Chi-square (χ^2) to test the hypothesis at 0.05 level of significance. A face and content validity of the instrument was determined the supervisor and other academic staff of the department, while its reliability was confirmed by administering 20 sample copies of

the questionnaire on health workers at the Military Hospital in Rivers State.

3. RESULTS

Table 1 above shows there were 66(19.1%) males and 279(80.9%) females. 267(77.4%) were married and 44(12.8%) were single, while majority of them, 167(48.8%) were above 40 years and Christians, 299(86.7%) respectively. Majority, 136(39.4%) were nurses, followed by medical social workers, 121(35.1%) and 176(51%), being majority, had put in 1-10 years of practice, while the least were 46(13.3%) for more than 20 years of practice.

**Table 1. Socio-demographic parameters
n=345**

Variables	Frequency	Percentage
Sex		
Male	66	19.10%
Female	279	80.90%
Marital status		
Married	267	77.40%
Single	44	12.80%
Widower	12	3.20%
Divorced	22	6.40%
Age (years)		
18 - 24	22	6.40%
25 - 30	88	25.50%
31 - 35	46	13.30%
36 - 40	22	6.40%
> 40	167	48.40%
Religion		
Christian	299	86.70%
Islam	46	13.30%
Professional qualification		
Nurses	136	39.40%
Doctors	33	9.60%
Laboratory scientists	22	6.40%
Pharmacists	33	9.60%
Social workers	121	35.10%
Years of practice		
1 -10	176	51.00%
11- 20	46	13.30%
Above 20	123	35.70%

In Table 2 above shows that 322(93.3%) knew that hypertension is a CVD, but 23(6.7%) did not know, while 289(83.3%) also knew that stroke is a CVD but 45(13%) did not know. Also, 312(90.43%) knew coronary heart disease as a CVD but 33(9.57%) did not, and 323(93.6%) knew peripheral vascular disease as a CVD,

while 22(6.4%) did not. Similarly, 34(9.9%) and 23(6.7%) did not respond respectively that angina and arrhythmia were CVDs, but 244(77.1%) and 266(77.1%) knew respectively that they were, and 67(19.4%) and 56(16.2%) respectively did not know that they were. Finally, 322(93.3%) and 23(6.7%) know and did not know respectively that myocardial infarction is a CVD.

Knowledge of the risk factors of CVD is presented in Table 3 above, and shows that 334(96.8%) and 11(3.2%) knew and did not know respectively that high cholesterol is a risk factor. 323(93.6%) knew that being over-weight is a risk factor to developing CVD, but 22(6.4%) did not, 311(90.1%) and 11(3.2%) know and did not know respectively that physical inactivity is a risk factor of CVD and 312(90.4%) and 22(6.4%) know and did not know that smoking is a CVD risk factor. 278(80.6%) know that sedentary lifestyle is a risk factor to CVD, but 44(12.8%) did not know, and 323(93.6%) know that excessive alcohol consumption is a risk factor of CVD but 11(3.2%) did not know.

Knowledge of the common signs and symptoms of cardiovascular disease is presented in Table 4 above. In it, 334(98.6%) knew that chest pain or heaviness at the center of the chest is a symptom or sign of CVD, but 11(3.2%) did not know, while Shortness of breath was known as a sign of CVD, but 11(3.2%) did not. Also, 234(67.8%) respondents know that coughing and wheezing are symptoms and signs of CVD, but 88(25.5%) did not know about it. Palpitations was known by 323(93.6%) respondents, but 11(3.2%) did not, 289(83.8%) swelling in the extremities is associated with CVD, but 33(9.6%) did not, while 312(90.4%) respondents know that fatigue is a sign or symptom of CVD, but 33(9.6%) did not know.

The Table 5 presents the compliance to CVD preventive methods by the respondents. 44(12.8%) always discuss heart disease prevention with their doctor, but 157(45.5%), 66(19.1%) and 78(22.6%) does this sometimes, rarely and never respectively. 110(31.9%) always check their blood pressure, but 190(55.1%) check it sometimes and 45(13%) rarely checked

Table 2. Knowledge of cardiovascular diseases

The following are cardiovascular diseases	True	False	No Response
Hypertension	322(93.3%)	23(6.7%)	
Stroke	289(83.8%)	45(13.0%)	
Coronary heart disease	312(90.43%)	33(9.57%)	
Peripheral vascular disease	323(93.6%)	22(6.40%)	
Angina	244(70.7%)	67(19.4%)	34(9.9%)
Arrhythmia	266(77.1%)	56(16.2%)	23(6.7%)
Myocardial infarction	322(93.3%)	23(6.7%)	

Table 3. Risk factors of CVD

The following are the risk factors for developing CVD	True	False	No response
High cholesterol	334(96.8%)	11(3.2%)	
Over weight	323(93.6%)	22(6.40%)	
Physical inactivity	311(90.1%)	11(3.2%)	23(6.7%)
Smoking	312(90.4%)	22(6.4%)	11(3.2%)
Sedentary lifestyle	278(80.6%)	44(12.8%)	23(6.7%)
Excessive alcohol consumption	323(93.6%)	11(3.2%)	11(3.2%)

Table 4. Signs and symptoms of cardiovascular disease (CVD)

The following are signs and symptoms of CVD	True	False	No response
Chest pain or heaviness at the center of the chest	334(96.8%)	11(3.2%)	
Shortness of breath	334(96.8%)	11(3.2%)	
Coughing or wheezing	234(67.8%)	88(25.5%)	23(6.7%)
Palpitations	323(93.6%)	11(3.2%)	11(3.2%)
Swelling in the legs, ankles or feet	289(83.8%)	33(9.6%)	23(6.7%)
Fatigue	312(90.4%)	33(9.6%)	

Table 5. Compliance to cardiovascular diseases preventative methods

Variables	Always	Sometimes	Rarely	Never
I discuss heart disease prevention with my doctor	44(12.8%)	157(45.5%)	46(19.1%)	78(22.6%)
I check my blood pressure regularly	110(31.9%)	190(55.1%)	45(13%)	-
I check my blood sugar periodically	44(12.8%)	213(61.7%)	44(12.8%)	44(12.8%)
I check my lipid profile regularly	22(6.4%)	101(29.3%)	67(48.4%)	55(15.9%)
I don't miss my appointment with my doctor	88(25.5%)	101(29.3%)	44(12.8%)	89(25.8%)
I take my medication every day	144(41.7%)	78(22.6%)	22(6.4%)	44(12.8%)
I smoke	23(6.7%)	22(6.4%)	11(3.2%)	244(70.7%)
I engage in physical exercise three times a week	57(16.5%)	199(57.7%)	47(19.4%)	22(6.4%)
I use the stairs instead of elevator	167(48.4%)	156(45.2%)	11(3.2%)	11(3.2%)
I take carbonated drinks	22(6.4%)	156(45.2%)	46(13.3%)	55(15.9%)
I visit eateries	33(9.6%)	156(45.2%)	44(12.8%)	12(3.5%)
I eat plenty fruits and vegetables	189(54.8%)	144(41.7%)	22(6.4%)	-
I plan my duties	166(48.1%)	101(29.3%)	44(12.8%)	22(6.4%)
I take uncompleted work or files home	44(12.8%)	100(29.0%)	23(6.7%)	78(22.6%)
My job is not stressful	55(15.9%)	189(54.8%)	46(13.3%)	22(6.4%)

their blood pressure, just as 213(61.7%) checked blood sugar periodically sometimes, but 44(12.8%) checked it always. Also, 22(6.4%) always checked their lipid profile regularly, but 101(29.3%), 167(48.4%) and 55(15.9%) checked it sometimes, rarely and never checked it respectively. 89(25.8%) never missed appointment with their doctor, however, 88(25.5%), 101(29.3%) and 22(12.3%) do not miss it always, sometimes and rarely respectively. The table also showed that 144(41.7%), 78(22.6%), 22(6.4%) and 44(12.8%) took their drugs always, sometimes, rarely and never respectively, while 189(54.8%) always eat plenty of fruits and vegetables, 144(41.7%) eat it sometimes, and 12(3.5%) eat it rarely. 78(22.6%) never took uncompleted work home, but 123(35.7%), 100(29%) and 44(12.8%) rarely, sometimes and always take their uncompleted work home. Finally, 55 (15.9%) always did not have stressful, but 189(54.8%) did have sometimes, while 46(13.3%) rarely had and 22(6.4%) never had stressful job.

3.1 Hypotheses

The hypothesis was set at p-value of 0.05, while the tabulated value was set at Chi-square of 2.50, owing to the Likert-scale format employed.

3.1.1 Hypothesis 1

Gender had no significant effect on the knowledge of CVD among the healthcare workers.

3.1.2 Hypothesis 2

Age has no significant effect on the knowledge of cardiovascular diseases among health care workers in the University of Port Harcourt.

3.1.3 Hypothesis 3

Profession has no significant effect on the knowledge of cardiovascular diseases among health care workers in the University of Port Harcourt.

3.1.4 Hypothesis 4

Gender has no significant effect on the compliance with cardiovascular diseases preventive measures among health care workers in the University of Port Harcourt.

4. DISCUSSION

Most of the respondents knew what cardiovascular diseases are. More than four-fifths, however, in the cases of angina and arrhythmia, 34(9.9%) and 23(6.7%) did not respond. Their knowledge of risk factors to the development of CVDs also showed that four-fifth knew, just like its counterpart on what they are. Some persons did not respond to physical inactivity, 23(6.7%), smoking, 11(3.2%), sedentary life style, 23(6.7%) and excessive alcohol consumption, 11(3.2%). These observations are similar to the findings by Gary [13], who observed that most of their respondents knew what the risk factors of CVD were, while indicating the disparity in these risk factors among the different races, ages, sex and lifestyle

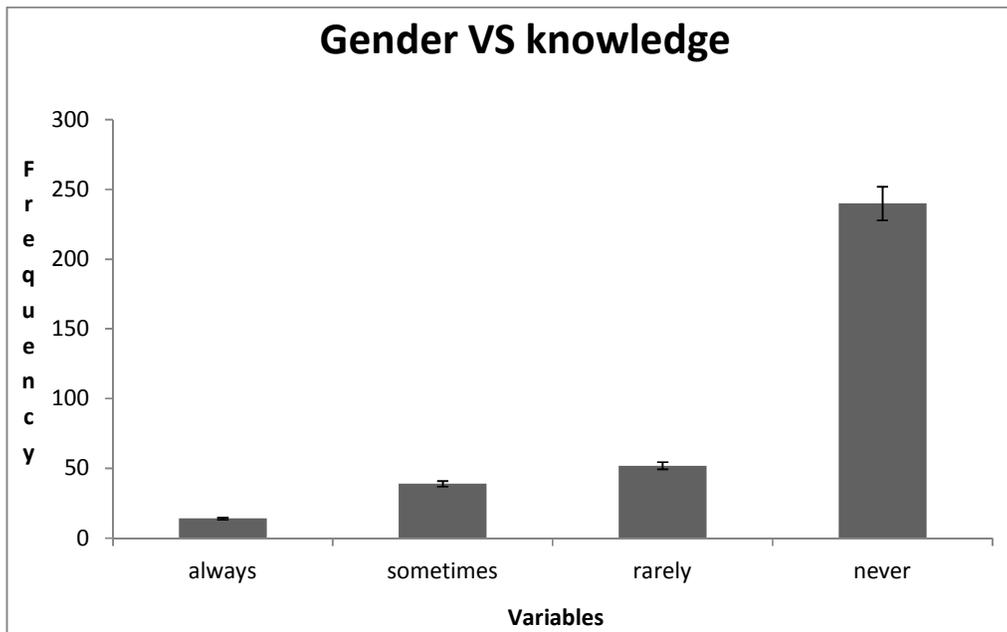


Fig. 1. The calculated value is 3.50 while the tabulated is 2.50, at a p-value of 0.05. Since the tabulated is less than the calculated, it is statistically not significant. The null hypothesis is accepted. There is thus, no significant relationship between gender and the knowledge of CVD among the healthcare workers in the UPTH

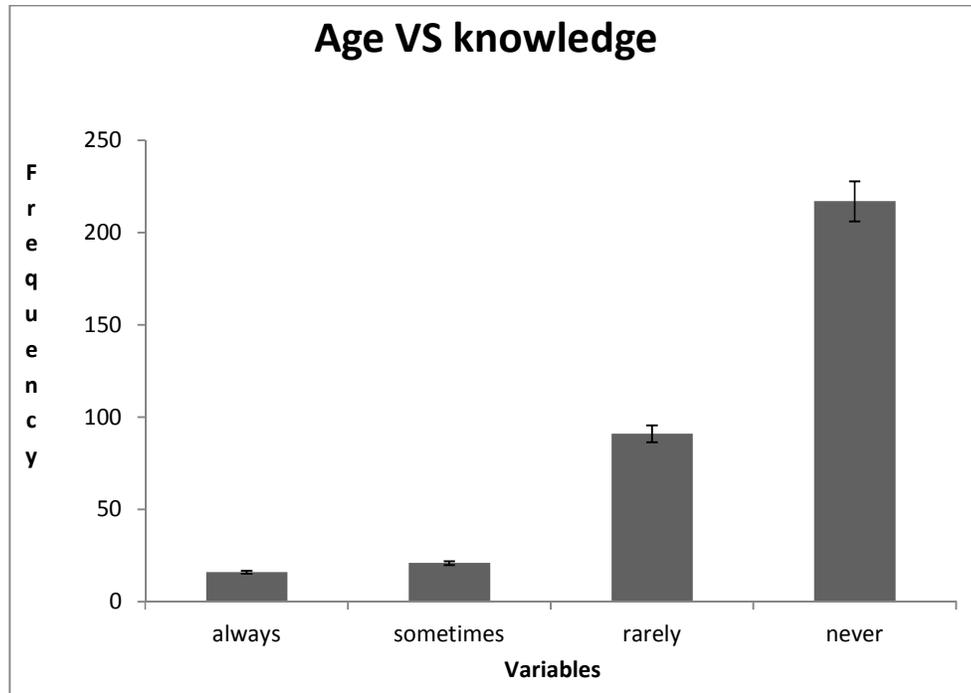


Fig. 2. The calculated value is 3.48 while the tabulated is 2.50, at a p-value of 0.05. It is statistically not significant and the null hypothesis is accepted. No significant relationship between age and the knowledge of CVD among healthcare workers in UPTH

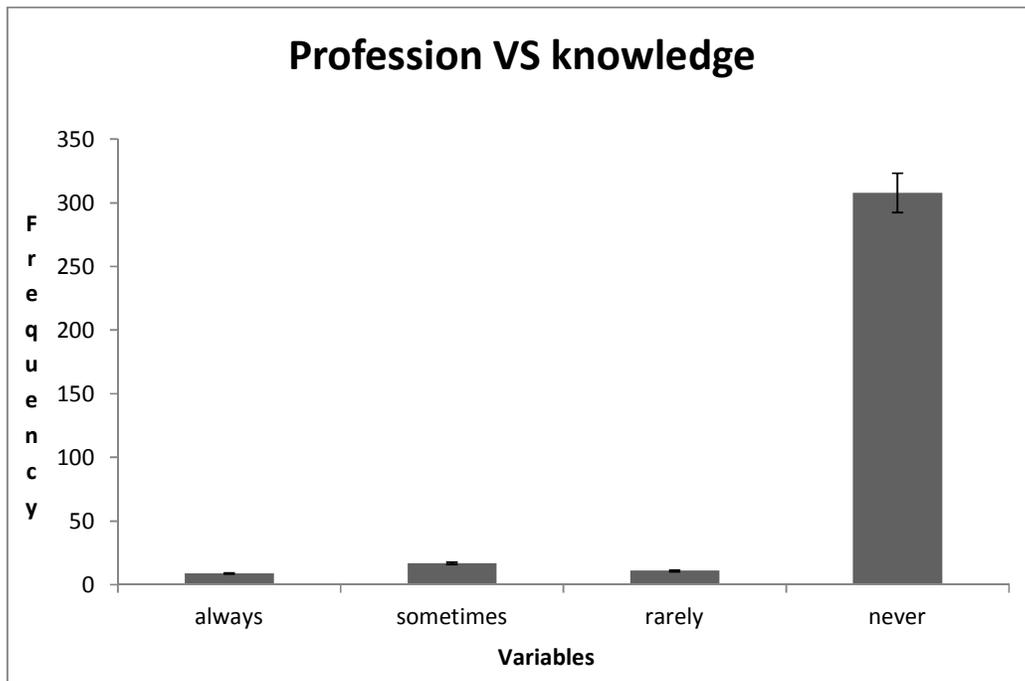


Fig. 3. The calculated value is 3.79 while the tabulated is 2.50, at a p-value of 0.05. It is statistically not significant and the null hypothesis is accepted. No significant relationship between profession and the knowledge of CVDs among healthcare workers in the UPTH

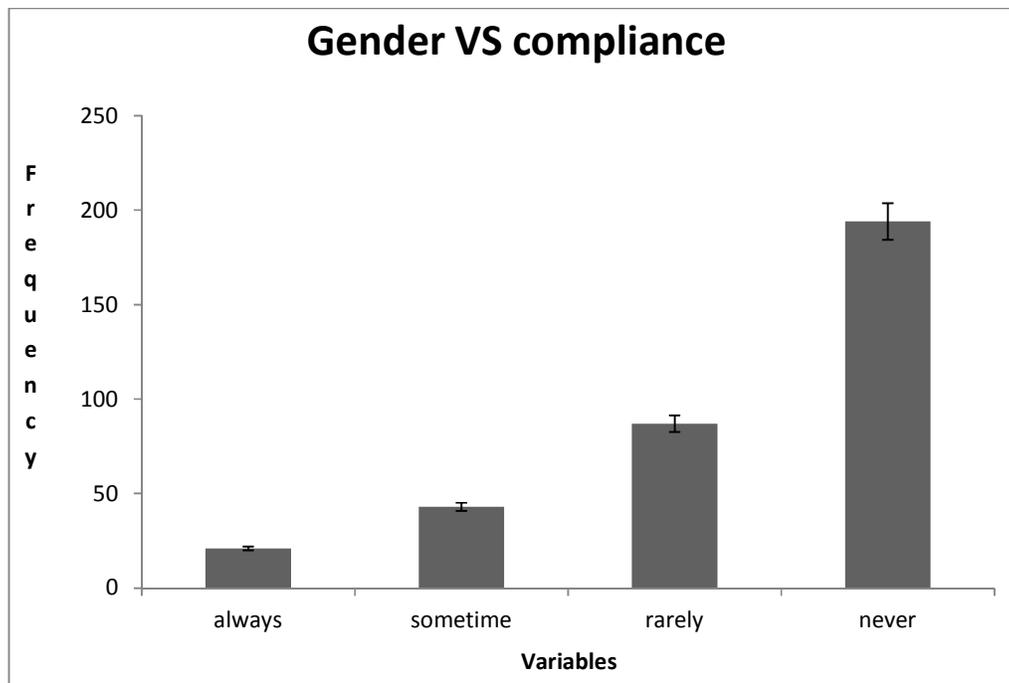


Fig. 4. The calculated value is 3.32 while the tabulated is 2.50, at a p-value of 0.05. It is statistically not significant. The null hypothesis is accepted. No significant relationship between gender and compliance to CVDs preventive measures among health workers in the UPTH

Knowledge on whether smoking of tobacco can cause CVDs showed that majority of the respondents answered in the affirmative, with a response rate of four-fifth, as in the other ones. This observation agrees with what Achalu [5] observed in a similar study.

Similarly, four-fifths of the respondents had sound knowledge of what the signs and symptoms of CVDs are and are similar for the risk factors that could make one to develop them. These findings also agree with those of Gary [13] for knowledge and risk of CVDs. This study, like another done in the same showed that obesity is a risk factor to the development of cardiovascular diseases [6], with the later reporting high rates of obesity in the Niger Delta region of Nigeria, and implicating sedentary lifestyle to its underlying cause. Another study by Achalu [5] also agrees with the both findings.

Compliance of the healthcare providers to the control of CVDs in this study showed even proportion of responses among the variables considered, with most responses skewed towards sometimes and closely followed by always, then rarely and never. It implies that though healthcare workers are aware of what CVDs are, its risk factors and signs and symptoms, they hardly comply with it. This could be attributable to negligence and lack of will to abide by it. The finding agrees with the observation of Alikor and Nwafor [6], which reported an increase in obesity in the Niger Delta region of Nigeria and that of Achalu [5].

The role of age and sex to development of CVD showed that most participants agreed in the affirmative. They knew that older people are more prone to the acquisition of these disease conditions and skewed towards the female gender. This agrees with what the World Health Organization [1] put forward, in respect to age and sex, to the acquisition of CVDs.

All the hypotheses showed that sex, age and profession were not significant to knowledge and compliance towards CVDs, hence, the null hypotheses were accepted and their alternate counterparts rejected. This is because all the calculated hypotheses were higher than the tabulated ones.

5. SUMMARY AND CONCLUSION

The study determined the knowledge and compliance of healthcare workers in the UPTH

towards the causes and preventive measures of CVDs. The level of knowledge and compliance were observed to be high. This implies that the healthcare providers are abreast with what CVDs are and the measures to be taken, to avoid developing it. More still needs to be done at encouraging these practitioners on adherence to factors that may plunge them into this avoidable disease conditions. This can come in the form of enlightenment of both practitioners and those outside the medical profession. The study will be of relevance to the healthcare trainer, policy makers, healthcare professional and the health education student. It is thus, recommended that health institutions should ensure that their staff adhere to cardiovascular risk factors, employees always put up indicators that will remind them of these health disorders and also remind their wards and clients of the implications of non-adherence and regular communication between healthcare workers between their wards and clients about cardiovascular diseases, its risk factors, preventive measures and how and when to seek help.

CONSENT

It is not applicable.

ETHICS APPROVAL

Ethical approval for the study was obtained from the Ethics Committee of the University OF Port Harcourt.

PLAGIARISM

The manuscript and original write-up has been subjected to plagiarism test and observed to be within the prescribed limits in the institution where the study was conducted.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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