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PREVALENCE AND OUTCOME OF CARDIOVASCULAR DISEASE AMONG ADMITTED PATIENTS IN STATE TERTIARY HEALTH FACILITY, SOUTHWEST, NIGERIA

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ABSTRACT: *Cardiovascular Diseases (CVDs) are major causes of morbidity and disabilities globally with high prevalence in developing countries including Nigeria. Therefore, this study employed a retrospective research survey to determine the prevalence and outcome of cardiovascular diseases among admitted patients in medical wards, LAUTECH Teaching Hospital, Osogbo, Southwest, Nigeria. The objectives of this study are to: determine the prevalence of CVD among admitted patients; find out the outcome of CVD among admitted patients. This study was a 5years retrospective descriptive study of consecutive adult patient with diagnosis of cardiovascular diseases admitted into male and female medical wards, LAUTECH Teaching Hospital, a tertiary health facility in Osun state Nigeria, between January 2014 and December 2019. Data that were extracted from admission and discharge register include age, sex, date of admission, diagnosis, and date of discharge or death, outcome of management and complications. Data were analyzed using descriptive and inferential statistics. The result revealed 23.1% prevalent rate of cardiovascular disease which was found to be high among males than females. Cardiovascular diseases discovered in the study area were hypertensive heart disease, congestive cardiac failure, dilated cardiomyopathy, ischeamic and hemorrhagic stroke. The study further revealed that majority of the patients improved and discharged home. In conclusion, cardiovascular diseases were observed to be high in the study area with high prevalence among male patients aged 60 - 69 years. It is therefore recommended that early detection, prompt management should be ensured, appropriate preventive measure such as regular exercise, diet regulation and regular check-up should be encouraged to reduce complications, need for hospital admission and improve outcome of cardiovascular diseases.*

KEYWORDS: prevalence, cardiovascular disease, admitted patients, state tertiary health facility, Southwest, Nigeria.

INTRODUCTION

Cardiovascular disease (CVD) is one of the major causes of death and disability among men and women in both developed and developing countries. Millions of people are affected world- wide with the lifetime risk exceeding 60% (WHO, 2018). Cardiovascular diseases are a group of disorders of the heart and blood vessels which include coronary heart disease, Hypertension or Hypertensive disease, Rheumatic heart disease, cerebrovascular accident and other conditions like Hypertensive encephalopathy, ischeamic heart disease, myocardial infection, disseminated cardiomyopathy (WHO, 2003).

Globally, in 2008, 63% of deaths were reported due to non-communicable disease, out of which 48% were due to cardiovascular related disease along (Alwan, 2011). Cardiovascular Disease contributed 88% of the death recorded in sub-Saharan African and the global mortality burden from CVD has been projected to increase by 20% by the year 2020 with the greatest contribution expected from region such as Sub-Saharan African (Moran et al., 2013). However, associated mortality from CVD differ between Sub-Saharan African and developed Western Countries which is due to the fact that coronary artery disease is the main cause of death among black America, stroke was the leading cardiovascular causes of death in sub-Saharan Africa while hypertensive heart disease and heart failure are also commonly reported cardiovascular causes of death in sub-Saharan Africa including Nigeria (Sliwa et al., 2008; Moran, et al., 2013; Wang et al., 2014).Moreover, the burden of CVD in developing countries has increased significantly, twice as many deaths from CVD occur in developing countries as in developed countries (WHO, 2002). The main types of cardiovascular disease are coronary heart disease (CHD) and stroke, about half of all deaths from CVD are from CHD and about a quarter are from strokes coronary heart disease is now the leading cause of death world-wide, with estimated yearly death value of 3.8% million in men and 3.4 million in women (Peterson et al., 2005). It is estimated that 80-90% of people dying from CHD have one or more major risk factor that is influenced by lifestyles (Mackay & Mensah, 2004).

According to Mackay & Mensah (2004), it was identified that high blood pressure is a major risk factor for heart disease people aged over 50years , the World Health Report also estimate that 60% of coronary heart disease around 40% of ischeamic stroke in developed countries is due to total blood cholesterol more than 3.8mmo/L (WHO 2002). The major modifiable risk for the development of coronary heart disease were smoking, which account for an estimated 32% death from cardiovascular disease in men aged 35-69yrs and 60%of CVD death in women of the same age (Peterson, et al, 2005). Moreso, Peterson et al (2006) stated that Diabetes mellitus magnifies the effect of other risk factors including raised cholesterol level, raised blood pressure, smoking and obesity. Men with type two diabetes mellitus have a 2-4 fold greater annual risk of coronary heart disease while women have an annual 3-5 fold greater annual risk of coronary heart disease. Among other factors are diet (WHO, 2002), physical inactivity (WHO, 2002), and obesity (Peterson et al, 2005.).

According to Mackey and Mensah (2004), Ischeamic stroke account for 80% of strokes which may be thrombotic or embolic strokes while 2-% of strokes are cause by heamorrhage. Annually, about 15 million people suffer a stroke worldwide of which 5 million die and another 5 million are left with permanent disabilities (WHO, 2004). Stroke however, is the third most common cause of death in developed countries, usually uncommon in person less than 40 years (WHO, 2004). Death rate from stroke for people less than 65 years have fallen by 23% in the past 10 years, recently rates have declined at slower rate particularly among younger age group. The aim of this study is to determine the prevalence and outcome of cardiovascular disease among admitted patients in male and female medical wards of LAUTECH Teaching Hospital, Osun State, South-West, Nigeria

Statement of Problem

Cardiovascular diseases account for the majority of disabilities and deaths that occur due to chronic diseases (Paradis & Chiolero, 2011). Global prevalence of cardiovascular disease (CVD) is growing on daily basis, most especially in the developing countries and WHO revealed that 80% of deaths from cardiovascular diseases and 87% of related disability currently occur in low and middle income countries (WHO, 2002). The high burden of mortality from cardiovascular causes in developing nations which is estimated at 9 million in 1990 and expected to rise to 19 million by 2020, is only partially explained by their large populations (Murray & Lopez, 1996). Numerous international and local researches had been carried out to assess the prevalence and risk factors of CVDs. However, in Nigeria, reports on the prevalence and outcome of cardiovascular disease (CVD) are scarce (Oguoma et. al, 2015). Therefore, the objective of the study is to assess the prevalence and outcome of CVD in LAUTECH Teaching Hospital, Osogbo, Osun State, Nigeria

Objectives

1. To determine the prevalence of CVD among male and female patients admitted to medical ward in LAUTECH Teaching Hospital (LTH) Osogbo, Osun State.
2. To determine the outcome of CVD among admitted male and female patients admitted to medical wards in LAUTECH Teaching Hospital (LTH) Osogbo, Osun State.

Research Questions

1. What is the prevalence of CVD among admitted patient in medical wards?
2 What is the outcome of CVD among admitted patients in medical wards?

Hypotheses

Ho There is no significant relationship between selected socio-demographic variables (Age, Gender, Marital status and Occupation) and prevalence of CVD

Ho There is no significant relationship between selected socio-demographic variables (Age, Gender, Marital status and Occupation) and outcome of CVD

Conceptual Model

Nolar J. Pender health promotion model was considered relevant to this study and the model focuses on optimizing the level of wellness of an individual as well as motivation to engage in pattern behaviour that enhance and maintains healthy living to ensure positive health outcome. Major components of the model are individual characteristic and experience, behavioural cognition and affect and behavioural outcome.

- Individual characteristics and experience comprise of prior health related behaviour which explain the past behaviour of an individual in relation to certain illness that has either direct or indirect influence on the likelihood of engaging in health promoting behaviour. Personal factors are factors that influence the likelihood of having certain health challenges, they are categorized as personal biological factors such as age, gender, body mass; personal psychological factors such as self-motivation, self-esteem, definition of health condition, perceived health status; personal socio-cultural factors such as socio-economic status, ethnicity, level of education, norms, and religion among others.
- Behavioural cognition and affect are responses that are capable of influencing individual health outcome as a result of acceptance of planned health actions. Behavioural cognition and affect include perceived benefit of health action, perceived barrier to action, perceived self-efficacy, interpersonal influence and situational influence.
- Behavioural outcome involves immediate competing demand and preference, commitment to a plan of action and health promoting behaviour.

Important of the concept to the study

The health promotion model deals with health behavioural activities that reduce the risk of cardiovascular disease and prevent complications associated with cardiovascular diseases. The model shows individual characteristics that predispose an individual to the risk cardiovascular diseases and its complications and also provide behavioural specific actions that can be taken to reduce the risk of cardiovascular disease as well as preventing complication associated with it thus ensuring positive patients' health outcome.

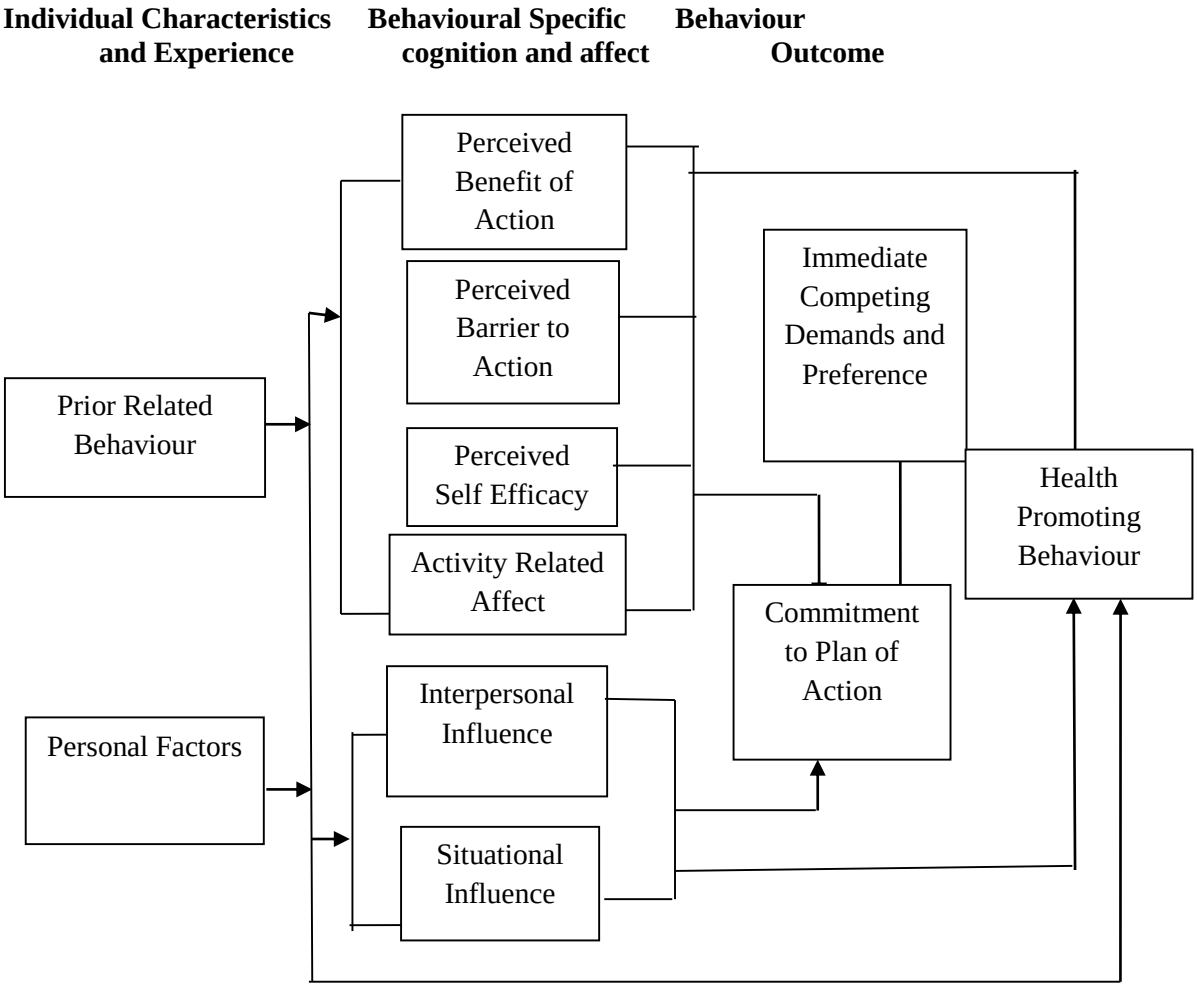

Figure 1: Health Promotion Model by Nolar J. Pender (1996)
Explanation of the basic concept applicable to this study

Individual characteristic:
Personal factors are factors that predispose an individual to cardiovascular risk which include socio-demographic factors such as age, gender, occupation, and knowledge about cardiovascular conditions, patients' perception and misconception about cardiovascular diseases, family history of CVD and genetic makeup of the patients.

Behavioural specific cognition and affect
Perceived benefit of action involves benefit of prompt presentation at the hospital to reduce the cost of disease progression and prevent complication associated with CVD.Perceived barrier to action involves factors that prevent individual with cardiovascular diseases to visit hospital at the onset of the condition such as financial constraint as a result of low level of income, fear of unknown complications of the condition, stress of taken drugs always, proximity to the hospital, other medical condition (comorbidity).Interpersonal influence involves attitude of family members and significant others about patient health condition which could be positive or negative influence,

this directly or indirectly influence the disease progression.Activity related effect and health behaviour activities are measures taken by patient with cardiovascular diseases to control the disease condition and prevent complications associated with the disease thus ensuring positive patients' outcome. Such activities include dietary and lifestyle modification, regular exercise, regular blood pressure monitoring, adherence to medication, regular follow-up visit. Behavioural outcome is commitment to a plan of action which involves acceptance of disease condition, medication compliance, regular check up and medical investigations' leading to a positive outcome of cardiovascular diseases. Failure to be committed to these actions can lead to serious irreversible complications and disabilities like stroke, paralysis, blindness, heart failure, renal failure and death.

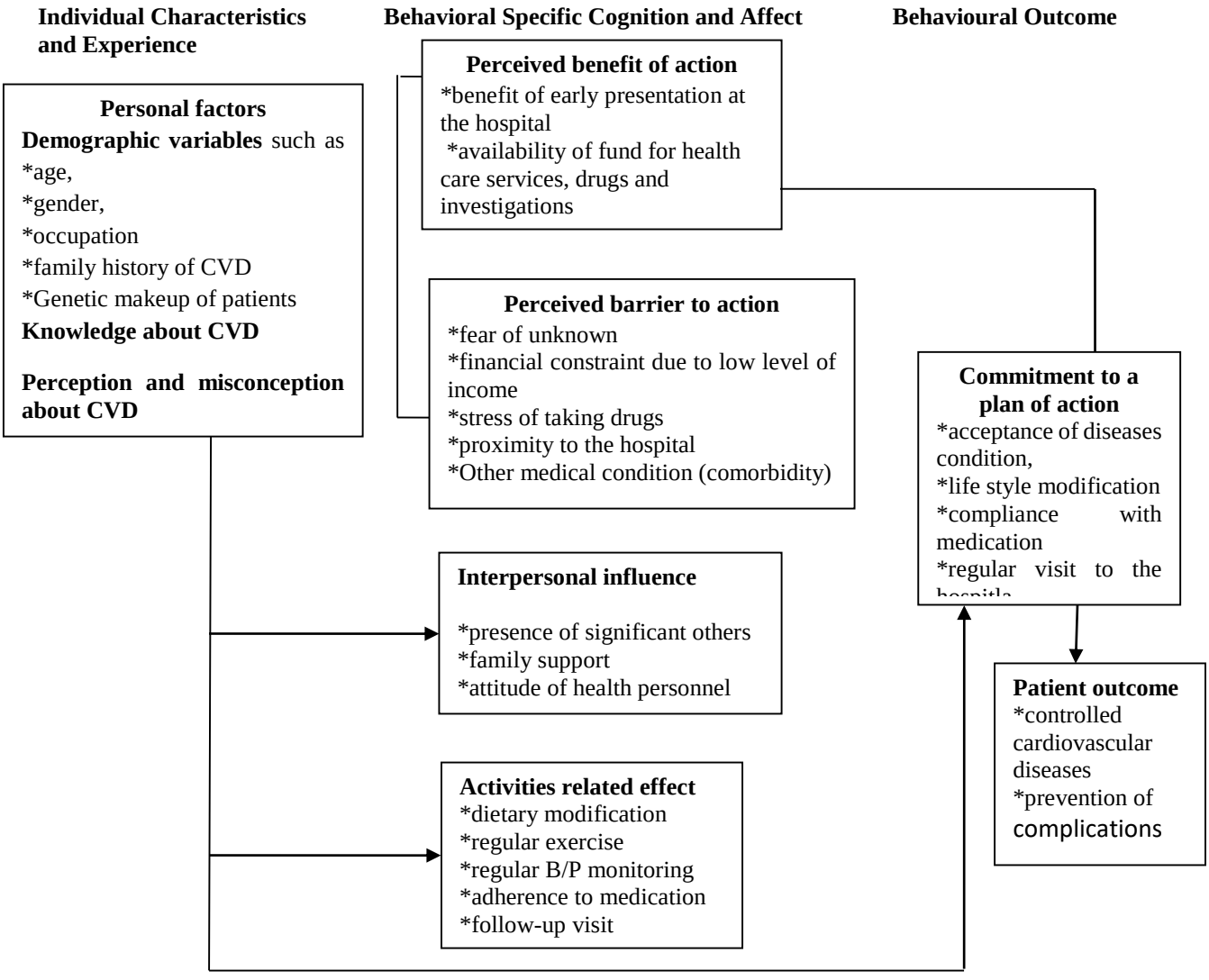

Figure 2: Researchers' model adapted from Nola J. Pender Health Promotion Model (1996)

METHODOLOGY

This study was a 5yrs retrospective, descriptive study of consecutive adult patient with diagnosis of cardiovascular disease admitted into male and female medical wards LAUTECH Teaching Hospital, a tertiary health facility in Osun state Nigeria, between January 2014 and December 2019. Data that were extracted from admission and discharge register include age, sex, date of admission, diagnosis, and date of discharge or death, outcome of management and complications, where the diagnosis could not be ascertained, the case file was collected from the medical record department to ascertain the diagnosis. Identification of case was based on documented diagnosis of CVD by the managing physicians either at the time of patients' discharge from the hospital or death. Ethical clearance was obtained from the health research and ethical committee from faculty of Nursing Sciences, Ladoke Akintola University of Technology (LAUTECH), Osogbo, Osun State.

Inclusion Criteria
All admitted patients in male and female wards between January 2015 and December 2019.

Exclusion Criteria
All out patients in clinic and emergency were excluded

DATA ANALYSIS
Data were coded and analysis using SPSS version 21 and presented in tables. Descriptive statistics of frequency, percentage, mean and standard deviation were used where applicable and inferential statistics of chi-square for stated testing hypothesis at 0.05 level of significant. Cross tabulation was also used to compare the two groups (male and female).
Continuous variable was expressed as means with standard deviation, categorical variable was expressed as frequency with the percentage, and comparison of continuous variable between the group (male and female) was expressed with cross tabulation.
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RESULTS

Table 1: Socio-Demographic factors of Patients with Cardiovascular Disease by Gender

	Gender					
Variable	**Male**	**Female**	**Total**	**X^2**	**df**	**p-value**
Age	**F (%)**	**F (%)**	**F (%)**			
20-29	5 (2.2)	8(4.1)	13(3.1)			
30-39	10 (4.4)	17(8.8)	27(6.4)			
40-49	32 (14.2)	30(15.5)	62(14.8)			
50-59	53 (23.6)	33(17.0)	86(20.5)			
60-69	68 (30.2)	32(16.5)	100(24.0)			
70-79	38 (16.9)	43(22.2)	81(19.3)			
80-89	17 (7.6)	27(13.9)	44(10.5)			
90-99	2 (0.9)	4(2.0)	6(1.4)			
Total	**225 (100.0)**	**194(100)**	**419(100)**	**21.254**	**7**	**0.003**
Mean age	**60.7** ± 14.3	**61.1**±17.6				

	60.8±15.95					
Marital status						
Single	6 (2.7)	7(3.6)	13(3.1)			
Married	219 (97.3)	151(77.8)	370(88.3)			
Divorce	0(0)	1(0.5)	1(0.5)			
Widow	0(0)	35(18.1)	35(18.1)			
Total	**225(100.0)**	**194(100)**	**419(100)**	**0.260**	**3**	**0.000**
Occupation						
Trading/Business	28 (12.4)	111(57.2)	139(33.2)			
Skilled Artisan	21 (9.3)	9(4.6)	30(7.2)			
Transporter	8 (3.6)	0(0)	8(1.9)			
Farming	16(7.1)	1(0.5)	17(4.1)			
Cleric/Clergy	6 (2.7)	2(1.1)	8(1.9)			
Student	6 (2.7)	3(1.5)	9(2.1)			
Civil Servant	41 (18.2)	21(10.8)	62(14.8)			
Self-Employed	15 (6.7)	1(0.5)	16(3.8)			
Retiree	84 (37.3)	42(21.7)	126(30.0)			
House wife		4(2.0)	4(0.9)			
Total	**225 (100.0)**	**194(100)**	**419(100)**	**113.626**	**9**	**0.000**

A total number of 1,816 patients were admitted between the year 2014 and 2019, out of which 1,050(57.8%) were males while 766(42.2%) were females. Cardiovascular diseases were observed in 419 patients. This represents 23.1% total admission. Cardiovascular diseases were found to be high among males than females as more than half of 225(53.7%) of the patients were male and less than half 194(46.3%) were females. The age ranged between 20 and 99 years with mean age of 60.8±15.95 years. About 267(63.7%) were between age 50-79 years with male being relatively younger than female (60.7±14.3 and 61.05±17.60 respectively) while 102(24.3%) and 50(12.0%) were between age 24-49 and 80-89 years respectively. The result further shows that there is statistical significant relationship between age and gender of admitted patient with cardiovascular diseases (X^2 = 21.254; df=7; p-value= 0.003) in the study area. Cardiovascular diseases were significantly common in patients aged 60-69 years 100(24.0%) with higher prevalent in male 68(30.2%).

Table 2: Prevalence of Cardiovascular Diseases among Admitted Patients

	Gender					
Variable	**Male**	**Female**	**Total**	**X^2**	**df**	**P-value**
Cardiovascular disease	**F (%)**	**F (%)**	**F (%)**			
Hypertensive Heart Disease	68(30.2)	55(28.4)	123(29.4)			
Dilated Cardiomyopathy	23(10.2)	20(10.3)	43(10.3)			
Congestive cardiac failure	48(21.3)	55(28.4)	103(24.6)			
Transient ischeamic attack	20 (8.9)	6(3.1)	26(6.2)			
Ischeamic stroke	43(19.1)	39(20.1)	82(19.5)			
Heamorrhagic stroke	23 (10.2)	19(9.7)	42(10.0)			
Total	**225(100.0)**	**194(100)**	**419(100)**	**7.923**	**5**	**0.161**

Table 2 shows the prevalence of cardiovascular diseases. Cardiovascular diseases discovered in the study area were hypertensive heart diseases 123(29.4%), congestive cardiac failure 103(24.9%), ischeamic stroke 82(19.5%), dilated cardiomyopathy 43(10.3%), hemorrhagic stroke 42(10.0%) and transient ischeamic attack 26(6.2%). A significant male prevalence for hypertensive heart diseases, transient ischeamic attack, dilated cardiomyopathy, ischeamic stroke and hemorrhagic stroke were also observed. Moreso, there is no statistical significant relationship between gender and prevalence of cardiovascular diseases among the admitted patients in the study area

Table 3: Outcome of Cardiovascular Disease among admitted patients

	Gender					
Variable	**Male**	**female**	**Total**	**X^2**	**df**	**p-value**
Outcome of cerebrovascular disease	**F (%)**	**F(%)**	**F(%)**			
Discharge	164(72.9)	138(71.1)	302(72.1)			
Discharge against medical advise	4(1.8)	16(8.2)	20(4.8)			
Referred	4(1.8)	12(6.2)	16(3.8)			
Death	53 (18.7)	28(14.5)	81(19.3)			
Total	**225(100.0)**	**194(100)**	**419(100)**	**18.965**	**3**	**0.000**

Table 3 shows that majority 302(72.1%) of admitted patient with cardiovascular diseases were discharged home alive, while 81(19.3%) death were recorded. The result further shows that there is statistical significant relationship between gender of patients with cardiovascular diseases and outcome of cardiovascular diseases (X^2 = 18.965; df=3; p-value= 0.000)

TEST OF HYPOTHESIS

Table 4: Relationship between selected socio-demographic characteristics of admitted patient and prevalence of cardiovascular diseases

ANOVA[a]

Model	**Sum of Squares**	**df**	**Mean Square**	**F**	**Sig.**
Regression	137.020	4	34.255	12.570	.000[b]
Residual	1128.240	414	2.725		
Total	1265.260	418			

a. Dependent Variable: Cardiovascular Diseases

b. Predictors: (Constant), Occupation, Age, Marital Status, Gender

Table 5 indicates that regression model predict the dependent variable (P = 0.000) which is less than 0.05 indicating statistical significant relationship between the predictors (Age, Gender, Marital status and occupation) and prevalence of cardiovascular diseases

Table 5: Relationship between selected socio-demographic characteristics of admitted patients and outcome of cardiovascular diseases

ANOVA[a]

Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	17.876	4	4.469	3.150	.014[b]
Residual	587.428	414	1.419		
Total	605.303	418			

a. Dependent Variable: Outcome of Cardiovascular Diseases

b. Predictors: (Constant), Occupation, Age, Marital Status, Gender

Table 5 indicates that regression model predict the dependent variable (P = 0.014) which is less than 0.05 indicating statistical significant relationship between the predictors (Age, Gender, Marital status and occupation) and outcome of cardiovascular diseases

DISCUSSION OF FINDINGS

The mean age of admitted patient with Cardiovascular Disease (CVD) was 60.8 ± 15.95 years and was slightly more male (30.2%) than females (16.2%). Majority 370 (88.3%) were married, major occupation of the patient was Trading (39 (33.2%) while 126 (30.0%) were retiree. This study was in tandem with the study conducted in South Indian with average age (60.12 ± 9.89 years) of patient with CVD and 89% were above age 40 years showing the strong association between the higher age and prevalence of CVD (Prasanna et al., 2013).This is further supported by Onwubere and Ike (2000) who reported that 56.5% of hypertensive patients admitted in the ward were in the 50-70years age group.

Finding from the study revealed 23.1% prevalence of cardiovascular disease among admitted patient in the study area, with slight high prevalence among male than female, 53.7% and 46.3% respectively. This is supported by Nelson et al. (2004) in their study with high prevalence (20.46%) of CVD among medical admission in UNTH Enugu; South West Nigeria. Another study concluded in Sub-Saharan African indicated 19.9% prevalence rate of CVD (Etyang & Scoltt, 2003). Tamene et al. (2019) also found out that 57% of patients with cardiovascular diseases were females while 43% were males and among cardiovascular diseases identified were congestive cardiac failure (44.4%) and hypertensive heart diseases (44.1%). This study is in contrast with the study conducted by Nelson et al. (2014) who found that cardiovascular diseases were more prevalent among female patients.

The study further revealed that hypertensive heart disease (29.4%) was common among admitted patient which was slightly high in male than female, followed by congestive cardiac failure (24.6%), and recorded more in females than male. However, Cardiovascular Accident ranging from transient ischeamic attack to ischeamic and hemorrhagic stroke was observed to be more prevalent (35.8%), This was observed more in male than female 38.2% and 32.9% respectively. Therefore, a significant male prevalence for hypertensive heart disease, transient ischeamic attack, ischeamic stroke, dilated cardiomyopathy, ischeamic and hemorrhagic stroke were observed. This finding is in tandem with the study conducted by Giosia et al. (2017) that the incidence of CVD in

women is usually lower than in men, but women have a higher mortality and worse prognosis after acute cardiovascular events. Moreso, clinical studies of CHD have found that women in CHD are usually older than men with CHD and have a higher expression of CVD risk factors (Garcia et al., 2016).

This finding is also in line with American heart association (AHA) report (2016) that among the 5.1 million cases of heart failure, 52.0% were men and 47.1% were women (Mozaharian, et. al., (2016). Also women are more prone to have heart failure and higher rates of hospitalization and mortality compared with men is (Mozaharian, et. al., 2016). Ahmed (2015) also recorded prevalence rate of hypertension ranging from 26.0% to 50.7% in male and 20.9% to 5.2% in females.

Furthermore, the finding revealed that majority of patient with CVD were discharged home after they have recovered from the condition, however, less than one fifth of patient died on admission as a result of CVD related condition with higher mortality recorded among male. Hence, among 419 patient admitted with cardiovascular diseases, 302 (72.1%) were discharged and 81(19.3%) died. This finding is supported by Buckley and Piltluck, (2015), in a health system with high quality of care patient get the necessary and appropriate care needed with better outcome of condition being managed them for more so, high quality in a health system with high quality care, patients get the care they need, when they need it, without undergoing unnecessary or inappropriate treatment, for better out of disease condition. More so, high quality care not only provides patient with the best opportunity to achieve the outcome they seek,

Limitations of the study

A lot of constraints were observed in the process of carrying out this study. Firstly, there were cases of incomplete data as a result of inadequate documentation. Secondly, due to industrial and strike action that led to partial of activity in the hospital and there was no patient admission for certain period included in the study.

CONCLUSION AND RECOMMENDATION

Cardiovascular diseases were observed to be high in the study area, with high prevalence among male patients between ages 60 and 69 years. The most prevalent cardiovascular diseases were ischeamic and hemorrhagic stroke, hypertensive heart diseases and congestive cardiac failure. It is therefore recommended that early detection, prompt management of the condition should be the goal of individual patients, health care personnel and Government. Moreso, appropriate preventive measure such as regular exercise, diet regulation and regular check-up should be put in place to reduce complications as well as the need for hospital admission so as to improve the outcome of cardiovascular diseases.

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