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Anxiety, depression and their correlates among patients with acute heart failure in South Western, Nigeria

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Abstract

Introduction: Psychological distress in heart failure has been relatively neglected by researchers and practitioners, and early detection and treatment may improve the prognosis and patient's quality of life. This study sought to assess psychological distress exemplified by depression and anxiety among acute heart failure(AHF) patients seen at a large teaching hospital in South West Nigeria.
Method: The study was a cross-sectional study of 153 consecutively admitted AHF patients who completed the Patient Health Questionnaire-9 and the Generalised Anxiety Disorder 7-item questionnaires. The report of this article adhere to the STROBE reporting guideline. Data was analysed using standard statistical methods.
Results: A total of 153 participants with AHF completed the study. The mean age±SD of participants was 57.7±15.0years. The prevalence of depression of any severity was 26.8% while that of anxiety was 9.2%. History of alcohol intake, male gender, and higher score of anxiety were independently associated with depression while the presence of higher depressive scores was the sole independent factor associated with anxiety.
Conclusion: Psychological distress is present in AHF patients, so clinicians must evaluate these problems early in all such patients, address their specific needs, and intervene through a team approach when necessary.

Keywords: Psychological distress, Depression, Anxiety, Heart failure, Acute heart failure

Introduction

There is a huge global disparity in the prevalence and burden of cardiovascular diseases, including heart failure, with about 80% of cardiovascular disease morbidity and mortality occurring in low- and middle-income countries (LMIC), where it exerts a significant burden on the economy, contributing up to 7% drain on Gross Domestic Product[1,2]. Although there is currently limited data to determine the disparity in the prevalence of heart failure between the developed countries and the LMICs, results from the International Congestive Heart Failure (INTER-CHF) prospective cohort study, an analysis of mortality due to heart failure worldwide, showed

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that overall mortality due to heart failure was highest in the LMICs of Africa and South-East Asia[3,4]. In other words, the most brunt of morbidity and mortality due to heart failure is borne by the LMICs.

There are objective and subjective experiences of physical morbidity, including frailty, poor physical autonomy and diminished capacity for activities of daily living, which has been described as negatively impacting on quality of life among patients with heart failure[5]. Aside, physical morbidity, heart failure is associate with significant psychological morbidities. Studies conducted in high-income countries have shown that psychological morbidities, such as anxiety and depression, are common among patients with heart failure. For instance, a meta-analysis of 149 studies conducted around the world reported a 28% prevalence rat of severe depression among patients with heart failure, which is several folds higher than the global 3.2% prevalence reported among adults with no physical morbidity[6,7]. Similarly, pooled prevalence of 13% has been documented for definite and clinically significant anxiety disorders, including generalized anxiety disorder, panic disorder and posttraumatic stress disorder, in systematic review of patients with heart failure around the world, compared with about 4.5% reported among the general population[8,9].

Psychological morbidity among patients with heart failure is an issue of significant public-health importance because the presence of co-morbid psychopathology has been found to contribute to morbidity and a poor prognostic indicator in heart failure[10-12]. Prospective studies have shown, for instance, that the presence of psychological disorders such as anxiety and depression, are associated with frequent hospitalizations, adverse cardiac events and mortality among patients with heart failure[10-12] .Psychological morbidity also contributes significantly to the cost burden of heart failure treatment and a key driver of poor quality of life in heart failure[11-13].

Africa, including Nigeria, is yet to be fully represented in the global literature on the psychological morbidity in heart failure. In the most recent available meta-analyses of studies which examined the prevalence and correlates of anxiety and depression among patients with heart failure worldwide, only one study from Nigeria was represented for anxiety disorder and just two for depression[6,8,14,15]. Though there are a few other studies that have examined the epidemiology of anxiety and depression among patients with heart failure in Nigeria, they did not meet the quality of and eligibility criteria for inclusion in global meta-analyses[16,17]. These eligibility criteria include cross-sectional or cohort studies conducted among adult-aged patients with acute or chronic heart failure, which examined the prevalence rate of anxiety disorder and/or depression of a defined severity according to standard guidelines and using a standardized and validated instrument for assessment.

In other words, despite the paucity of studies which have examined the prevalence of anxiety and depression among heart-failure patients in Nigeria, only a handful has used standardized instruments or defined the severity of the anxiety and depression according to standard guidelines. Furthermore, virtually all the few studies from Nigeria and most of the studies in the global literature had focused on stable patients with chronic heart failure. Acute heart failure, which is defined as new-onset or worsening signs and symptoms, unlike chronic heart failure presents new clinical and psychological burden which is not comparable with the lived-experience of chronic heart failure and as such; the emotional response among patients with acute heart-failure is expected to be different from that seen in chronic heart failure.

Acute or chronic heart failure, notwithstanding, poor insight into the psychological morbidity associated with heart-failure will lead clinicians to frequently under-diagnose or inadequately treat anxiety and depression among patients with heart failure. Early detection and treatment of psychological morbidity will improve the prognosis of heart failure and improve patient's quality of life[18]. This is because patients with HF who are experiencing psychological distress have a lower rate of adherence to their treatment regimen, a lower rate of adaptation to their disease, and ultimately, more interferences in and disruption of the treatment process[6]. Inadequate treatment worsens prognosis, especially in patients with acute heart failure who already runs a much higher risk of mortality[19].

In a country like Nigeria where mental-health

resources are scarce, inequitably distributed and poorly organized, identifying and documenting mental-health comorbidity among patients with care-intensive physical morbidity such as heart-failure is important, so as to raise awareness and attract the attention of policy makers[20]. With the increasing awareness of the Biopsychosocial Holistic Model of Cardiovascular Health, it is necessary to improve the insight into the burden and drivers of psychological distress among HF patient in the region[21]. Fortunately, there are available standardized and validated tools that can be used to assess psychological morbidity in hospitalized populations[21]. There are also psychological interventions that have proven effective or shown promise in reducing emotional symptoms and improving quality of life among patients with heart failure[22].

The present study sought to access psychological distress, exemplified by depression and anxiety, among acute HF patients seen at the cardiology unit of a university teaching hospital in Nigeria.

Materials and Methods

Study design and Setting

The study was a cross sectional study carried out at the Cardiology Unit of the Department of Medicine of large teaching hospital in South West of Nigeria, a 1000-bed tertiary health facility that serves the population in Oyo State and other states of Nigeria.

Participants

All consecutively admitted patients with acute HF who completed the study questionnaire were recruited into the study. Those included were adults (18 years and above) with de novo HF or acute decompensated chronic HF, irrespective of the primary cause. The exclusion criteria as well as the diagnostic criteria used in the definition of heart failure in this study has already been described elsewhere[23].

Data measurement

The following data were obtained from the respondents with five days of admission.

i. Sociodemographic data

Structured questionnaire was used to collect the following data: demographic (age, gender) and, social (marital status, educational level, monthly income).

ii. Clinical data were New York Heart Association (NHYA) classification, co-morbidities such as hypertension

a. New York Heart Association Functional Classification

Participants are classified into four classes using a commonly used classification system[24].

Class I: No limitation of physical activity, Ordinary physical activity does not cause undue fatigue, palpitation or shortness of breath.

Class II: Slight limitation of physical activity. Comfortable at rest. Ordinary physical activity results in fatigue, palpitation, shortness of breath or chest pain.

Class III: Marked limitation of physical activity. Comfortable at rest. Less than ordinary activity causes fatigue, palpitation, shortness of breath or chest pain.

Class IV: Symptoms of heart failure at rest. Any physical activity causes further discomfort.

b. Symptoms of Depression

Symptoms of depression were assessed using the Patient Health Questionnaire-9 (PHQ-9). This is a brief, widely used, easily administered and multipurpose instrument for screening, diagnosing, monitoring and measuring the severity of depression. It is a nine-item instrument and has been used among HF patients. It is a continuous measure with total obtainable score of 27(Score range:0-27). The cut off for mild, moderate, moderately severe and severe depression are 5,10,15 and 20 respectively[25]. The instrument has been validated for use as an assessment tool among hospitalized Nigerian patients with physical comorbidity[26].

c. Generalized Anxiety Disorder

Generalized Anxiety Disorder Assessment Scale (GAD-7) is an easy-to-use screening tool and severity measure for generalized anxiety disorder[16]. It is a seven-item instrument. The questions in the tool covers a variety of physical, psychological, and emotional symptoms, including feeling anxious or restless, being easily fatigued, and having trouble concentrating. Total score obtainable is 21 and scores are categorised into four categories, with scores of 5, 10, and 15 represent cut-points for mild, moderate, and severe anxiety, respectively. The instrument has good psychometric properties among hospital populations in Nigeria[27].

Statistical methods

The collected data were entered into a secure electronic database. Normality test was done for each continuous variable using Kolmogorov-Smirnov Test. Normally distributed continuous variables were summarised as means and standard deviations and compared with student t test. Those that were not normally distributed are expressed as median and interquartile range. Categorical variables were expressed as frequencies and percentages, and they were compared with the Pearson chi-square test. Multivariate models were fitted to explain the possible risk factors for depression and anxiety among these patients. For all tests, a two-sided p-value of <0.05 was considered significant. The statistical analysis was done using International Business Machines (IBM) Corporation Statistical Product and Service Solutions(SPSS) for Windows version 23.0(Armonk, NY: IBM Corp)

Ethical consideration

Informed consent was sought from the participants. The questionnaires used for the study were kept secure, and the data generated were also kept secured from third parties.

The study approval was sought and obtained from the Human Research Ethical Review Committee of University of Ibadan/University College Hospital Joint Ethics Committee (assigned number UI/EC/18/0004).

Results

A total of 153 participants with acute heart failure completed the study. The mean age of participants was 57.7±15.0 years completed the study and they are mostly males (62.7%). Other socio-demographic details of respondents were as shown in Table 1.

As shown in Table 2, using the international cut-off points, the prevalence of depression of any severity was 26.8% (95% Confidence Interval(CI): 20.3-34.0)] while that of anxiety was 9.2% (95% CI: 5.1, 13.7)]. In terms of severity, the prevalence rate of mild, moderate, and severe depressions was 19%, 5.9% and 2% respectively. Regarding anxiety, 7.8% and 1.3% of respondents had mild and moderate anxiety respectively, with no respondent reporting

Table 1: Basic profile of the study participants

Variables	
Age mean ± SD† *years*	57.0± 15.0
Elderly(≥60years) n(%)	73(47.7)
Male n(%)	96(62.7)
Married n(%)	128(83.7)
Educated n(%)	146(81.0)
Monthly income (<50,000 naira) n(%)	124(81.0)
History of Smoking n (%)	21(13.7)
Alcohol intake n (%)	55(35.9)
Hypertension n(%)	104(68.0)
NHYA‡ Classification n(%)	
I/II	37(24.2)
III/IV	116(75.8)
Myocardial infarction as HF precipitant n(%)	4(2.6)
Ejection fraction mean ± SD† %	37.4±9.9
Use of antidepressant or anxiolytic n(%)	0(0)

†SD:*Standard deviation*
‡NYHA:*New York Heart Association*

Table 2: The psychological profile of participants

Variables	
PHQ-9§ score mean ± SD	4.0± 3.6
Depression n (%)	41(26.8)
Depression severity n (%)	
No depression (0-4)	112(73.2)
Mild depression (5-9)	29(19.0)
Moderate depression (10-14)	9(5.9)
Moderately severe depression (15-19)	2(1.3)
Severe depression depression 20-27)	1(0.7)
GAD-7¶ median (IQR ±)	1(0-3)
Anxiety n (%)	14(9.2)
Anxiety severity n (%)	
Mild anxiety (5-9)	12(7.8)
Moderate anxiety (10-14)	2(1.3)
Severe anxiety (15-21)	0(0.0)
Both Depression and Anxiety n (%)	41(26.8)

§ PHQ-9: *Patient Depression Questionnaire-9*
†SD: *Standard deviation*
¶ GAD-7: *Generalized Anxiety Disorder 7*
± IQR: *Interquartile range*

Table 3: Logistic regression analysis for factors independently associated with depression among respondents with acute heart failure

Variables	B	S.E.	Wald	Exp(B)	95% C.I. for EXP(B)		P-value
					Lower	Upper	
Age years	-.027	.019	2.18	0.97	0.94	1.01	0.140
Married(Yes)	-.393	.722	0.30	0.68	0.16	2.78	0.586
Income(Yes)	-.623	.710	0.77	0.54	0.13	2.16	0.381
History of smoking(Yes)	-.446	.706	.399	0.64	0.16	2.56	0.528
History of alcohol intake(Yes)	-1.430	.676	4.472	0.24	0.06	0.90	0.034
Hypertension(Yes)	-.225	.529	.181	0.80	0.28	2.25	0.670
Myocardial infarction as precipitant(Yes)	-.602	1.360	.196	0.55	0.04	7.87	0.658
NYHA‡(I&II)	-.405	.550	.541	0.67	0.23	1.96	0.462
Ejection fraction	-.004	.022	.028	1.00	0.95	1.04	0.867
Gender(Male)	1.377	.691	3.975	3.96	1.02	15.35	0.046
GAD-7 score	-.666	.129	26.463	.51	0.40	0.66	<0.0001
Constant	5.101	1.818	7.875	164.19			.005

‡NYHA: *New York Heart Association*
¶ GAD-7: *Generalized Anxiety Disorder 7*

Table 4: Logistic regression analysis for factors that were independently associated with anxiety among respondents with acute heart failure

Variables	B	S.E.	Wald	Exp (B)	95% C.I.for EXP(B)		p-value
					Lower	Upper	
Age	.129	.071	3.315	1.14	0.99	1.31	0.069
Married(Yes)	1.863	1.617	1.327	6.45	0.27	153.34	0.249
Income(Yes)	1.518	1.633	.864	4.56	0.19	111.94	0.353
History of smoking(Yes)	2.675	3.041	.774	14.52	0.04	5633.11	0.379
History of alcohol intake(Yes)	3.008	1.862	2.609	20.24	0.53	778.18	0.106
Hypertension(Yes)	-2.373	1.939	1.498	0.09	0.00	4.17	0.221
NYHA Class(I&II)	-.244	1.132	.046	0.78	0.09	7.21	0.829
Ejection fraction(%)	-.013	.090	.019	0.99	0.83	1.18	0.889
Gender(Male)	-2.905	1.583	3.368	0.06	0.00	1.22	0.066
Diabetes mellitus(Yes)	-1.127	1.786	.398	0.32	0.01	10.73	0.528
PHQ-9 Score	-.807	.230	12.367	0.45	0.28	0.70	**>0.0001**
Constant	1.416	4.726	.090	4.122			.764

‡NYHA:*New York Heart Association*
§ PHQ-9:*Patient Depression Questionnaire-9*

severe anxiety. Table 3 shows that, after controlling for other potential confounders, the sociodemographic and clinical variables independently associated with depression among participants were history of alcohol intake, male gender, and higher score of anxiety on GAD-7. Table 4 shows that the sole independent factor associated with anxiety among the participants was the presence of higher depressive scores on the PHQ-9. The spearman correlation co-efficient between PHQ 9 and GAD 7 was 0.664(p=<0.0001) and this relationship is still significant after the control for age, and ejection fraction (correlation co-efficient=0.691, p=<0.0001).

Discussion

The present study has further added to the existing evidence from the global literature, that psychological morbidity, such as anxiety and depression, is common among patients with heart failure[6,8]. Aside the fact that depression and anxiety can be part of the psychological reactions that can potentially occur after a sudden or prolonged medical morbidity of any kind, especially a cardiovascular disease; inflammation involving the immune system and alterations in the autonomic nervous system and other neuro-endocrine systems have been implicated in the shared mechanisms for the development and co-morbidity of psychological disorders, such as anxiety and depression, with heart disease[28,29,30]. Specifically, anxiety has been shown to have a direct relationship to the hypothalamic-pituitary-adrenal axis[31]. This axis causes vasoconstriction and an increase in stroke volume via a positive feedback loop. This had strong implication on the development, worsening prognosis and outcome of HF[29,31].

The prevalence of 26.8% and 9.2% for depression and anxiety respectively in the present study is several folds higher than the 5.5% and 3.5% reported from recent general-population studies which used same measuring instruments as the present study in Nigeria[31]. This finding clearly suggests that patients with acute heart failure in the present study had higher anxiety and depressive symptom morbidity compared with the general population. The 26.8% and 9.2% prevalence in the present study for anxiety and depression is, however, lower than the pooled prevalence hovering around 41% for depression and 13% for anxiety in the most recent global meta-analyses[6,8]. The prevalence for depression of any severity in the present study is also lower that the 32% pooled prevalence rate earlier reported from meta-analysis of existing studies conducted among patients with heart failure[6]. The lower prevalence in our study may be explained by the fact that our study was restricted to acute heart failure only while all previous studies from Nigeria and most from around the world, from which the existing meta-analyses were done, used patients with chronic heart failure mostly. It is possible that the complex psychosocial and neuro-biological mechanisms that drives the association between psychological morbidity and heart were still evolving or masked by the intense physical distress among patients with acute heart failure compared with those with chronic heart failure. A large proportion of this population are de novo acute HF[23]. However, it is important to note that, as pointed out by Adeponle&Thrombs on another study among patients with heart failure in Nigeria had used non-diagnostic instruments which tend to overestimate the prevalence for psychological morbidity[15,32].

Unlike the picture that has been seen in existing meta-analyses where moderate-to-severe depression constituted more than half of the severity of depression and anxiety in patients with heart failure, overwhelming majority of respondents in the present study who had anxiety and depression had the mild-to-moderate forms. The preponderance of milder forms of both anxiety and depression in the present study may also support our earlier notion that the psychological morbidity in acute heart failure may be in early evolution stage which worsens as the disease progress in the patients. This finding has implication for service planning. Given the fact that most of the international guidelines for the management of emotional disorders such as depression and anxiety support psychological therapy as first-line management in mild depression, there is need to consider incorporating screening and psychological intervention services into the cardiac care unit[33]. There are accurate and easy-to-use assessment tools (such as the ones used in the present study) and basic but effective psychological interventions that can be delivered by trained non-specialist and lay health-

workers in the hospital setting[34]. Such task-shifting approach to mental-health services are recommended for LMIC settings where specialized mental-health services are scarce[34].

Consistent with the findings of others studies, the present study identified the history of alcohol intake, male gender, and as predictors of depression in heart failure[35,36]. Other factors that has been reported to be associated with depression in heart failure in other studies, but which though tested in the present study, but not found to be associated with depression include single marital status, higher NYHA staging, and being older than 70 years[35-37]. The differences may be explained by methodological differences.

The coexistence of anxiety disorders and depression is common in heart failure[14,38]. A possible dose-response relationship between anxiety and depressive symptoms in patients with HF has been previously suggested[38]. Our study showed both predict each other among HF patients with a very strong correlation between the PHQ-9 and GAD-7 scores[7,20]. Partial correlation showed that the relationship between PHQ-9 and GAD-7 scores remains significant, regardless of age and ejection fraction. The prevalence of anxiety alone was lower compared to depression in this study, and this observation have been found in other studies, reserve in some and similar in others[5,7]. This study found the only independent factor associated with anxiety in acute HF to be the PHQ-9 score. This suggests that addressing both anxiety and depression may be important for managing heart failure.

Notwithstanding that this study is a single-centre cross-sectional study in nature, it provided further insight into psychosocial distress among heart failurein Nigeria[12,22]. It studied two major mood disorders simultaneously in hospitalised HF patients. The tools used have been previously recommended for use in clinical scenarios, and further suggest it potential for use in clinical practice in this environment. Furthermore, the findings also demonstrate the need for comprehensive assessment and support in the management of hospitalised heart failure patients in our study population.

Conclusion

Psychological distress is present in HF patients, so clinicians must evaluate these problems in all hospitalised HF patients, address their specific needs, and intervene through a team approach when necessary. This approach should include regular screenings for psychological distress, such as anxiety and depression, as well as providing appropriate resources and support to address these issues. Additionally, integrating mental health professionals into the care team can help ensure that patients receive comprehensive and holistic care for both their physical and psychological well-being.

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This study was self-funded by the researchers.

Conflict of interest

There is no conflict of interest to declare

Authors' contribution

Conceptualization: [OA(1)],Methodology:[OA(1)]Formal analysis[OA(1)],Investigation: [OA(1),AA,OSO,AA,AMA,OOO],Data curation: [OA(1)],Writing – Original Draft: [OA(1)], Writing – Review & Editing: [OA(1),AA,OO,OSO,AA,AMA,OA(2),OOO],Visualization: [OA(1),AA,OO,OSO,AA,AMA,OA(2),OOO], Supervision: [OA,OSO,AA],Other contribution [OA(1),AA,OO,OSO,AA,AMA,OA(2),OOO]

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Data availability statement

Data supporting this work would be made available upon reasonable request to the corresponding author.

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