Research

Prevalence of Depression and its determinants amongst patients with Heart Failure in a Teaching Hospital in Port Harcourt

[1]Boma Oyan, [1]Sarah Abere, [1]Ernest O Nwazor, [1]Ovundah E Nyeche, [1]Marcel F Jumbo
[1]Department of Internal Medicine, Rivers State University Teaching Hospital, No 8-10 Harley Street, Old GRA Port Harcourt, Rivers State

Corresponding author: Boma Oyan, *Department of Internal Medicine, Rivers State University Teaching Hospital, No 8-10 Harley Street, Old GRA, Port Harcourt, Rivers State; boma_oyan@yahoo.com; +2348033095303*

Article history: Received 26 April 2022, Reviewed 15 June 2022, Accepted for publication 8 October 2022

Abstract

Background: As the life expectancy of patients with heart failure improves with recent advances in pharmacology and device therapies, depression is increasingly being recognized as contributing to morbidity and overall quality of life. The purpose of this study was to determine the prevalence of depression and risk factors associated with depression in patients with heart failure in Rivers State University Teaching Hospital.

Methods: A total of 60 patients with heart failure attending the Cardiology clinic were consecutively recruited in this study. Interviewer administered structured questionnaires were used to obtain sociodemographic, behavioural and disease related variables. The Patient Health Questionnaire-9 was used to diagnose and classify the severity of depression. Proportions were compared with chi-square test. Binary logistic regression was used to determine the relationship amongst variables. All tests were considered to be statistically significant at the p-value ≤ 0.05.

Results: The mean age of the study participants was 56.60±12.59 years with a male to female ratio of 1.4:1. The prevalence of depression was 65.0% (39 persons), of which, 20 (33.3%) persons had mild depression, 12(20.0%) and 7(11.7%) persons had moderate and severe depression respectively with a mean Patient Health Questionnaire-9 score of 11.52±5.11. Age, gender, educational level, and New York Heart Association class were significantly associated with depression. Level of education was the most important predictor of depression with adjusted odd ratio (aOR) of 6.27(95% CI:1.76-22.36; p=0.005)

Conclusion: Depression is common in heart failure with a significant negative impact on overall disease burden.

Key words: Heart Failure, Depression, Nigeria, PHQ-9, Risk Factors

Introduction

Heart failure is a clinical condition that presents with fatigue, breathlessness, and ankle swelling which develops rapidly (acute heart failure) or progressively (chronic heart failure)[1] and is said to affect 61.7 million people worldwide[2].

As the life expectancy of patients with heart failure improves with recent advances in pharmacology and device therapies[3,4], other diseases are increasingly being recognized as contributing to morbidity and mortality in this subset of patients.

Depression is a mental health problem characterized by sadness, loss of interest or pleasure, feelings of guilt or low self-worth, disturbed sleep or appetite, feelings of tiredness, and poor concentration[5]. Depression is common in heart failure in excess of that seen in the general population and constitutes an additional burden in the management of HF[6].

The prevalence of clinically significant depression in a meta-analysis was 21.5% but this ranges between 9-60%[6]. This variation could be as a result of different methods used in assessment of depression as there are several validated questionnaires[7-9] recommended as screening tools to identify depression in the population.

Heart failure severity has been reported to have a large impact on reported depression rates as prevalence of depression shows higher rates with higher New York Heart Association (NYHA) functional class with the rate of depression in

patients in class III nearly double that of patients in class II[6]. Prevalence of depression in sub–Saharan Africa is said to be high and ranges from 51% [10] to 54.6%[11] where female gender, current smoking, poor social support and longer duration of heart failure were significantly associated with depressive symptoms[10].

Differentiating a normal reaction to chronic illness from depression remains challenging in the context of HF, especially in the early period after HF hospitalization[12]. Attribution of symptoms to heart failure of depression may confuse the clinician as a partial overlap may exist. Because heart failure, major depression and anxiety disorder have interconnected symptoms, proper recognition of depression in patients with HF is difficult and several authorities now recommend that clinicians evaluate all patients with HF for depression and anxiety[3,4].

Depression in heart failure is associated with worse outcome across a broad range of events including reduced quality of life, reduced healthcare use, re-hospitalisation, adverse cardiovascular events and increased mortality[6,13]. However, a single centre study reported that mortality and readmission rates were independent of age and NYHA class[13].

There are shared pathophysiological mechanisms between HF and depression[14]. Depression causes alterations in the body's biological mechanisms such as increased inflammation, autonomic dysfunction, platelet agreeability and endothelial dysfunction; together with alterations in behaviour such as poor diet, poor medication adherence and reduced physical activity[15]. These alterations eventually lead to the poor outcome measures of reduced quality of life[14], increased hospitalization and increased mortality described in heart failure[6,13].

Despite the high rate of depression in HF, and its links to adverse outcomes in this population, this psychiatric symptom is often overlooked in clinical practice.

Methodology

Study design and subjects: This study was conducted in Medical Outpatient department of the Rivers State University Teaching Hospital (RSUTH) which is in Port Harcourt, the capital of Rivers State, South-South of the Federal Republic of Nigeria, a tertiary hospital owned and funded by the Government of Rivers State.

The study was a descriptive cross-sectional study and Heart failure participants who were older than 18 years and had been on follow-up at least for 3 months, who visited the cardiac follow-up unit of the Hospital during data collection period were included in the survey.

Participants: A total of 60 respondents with heart failure, aged 18 years and above attending the Cardiology clinic were selected via random sampling technique over a period of 5 months from January 2022 to May 2022. Critically ill patients and pregnant women were excluded from the study.

Ethical approval was obtained from the ethical board of the hospital. Documented informed consent was given by all the participants.

Outcome measures: To determine the prevalence of depression amongst patients with heart failure in Rivers State University Teaching Hospital.

To identify sociodemographic factors associated with depression in these patients.

Data collection: Interviewer administered structured questionnaires were used to obtain sociodemographic, behavioural and disease related variables. The Patient Health Questionnaire-9 was self-administered (read out to patients unable to read) to make a diagnosis, as well as measuring the severity of depression.

Statistical analysis: All data were analysed using the commercially available statistical package for social sciences (SPSS) version 21.0 analytic software. Data were expressed as mean ± standard deviations and percentages. Proportions or categorical parameters were compared with the chi-square test. Binominal logistic regression was used to determine the relationship amongst variables. All tests were considered to be statistically significant at the p-value < 0.05.

Results

The mean age of the respondents was 56.60±12.59 years with a range of 34 to 87 years. There was a

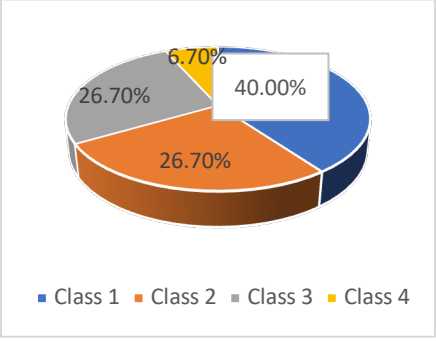
male preponderance with 35(58.3%) males and 25(41.7%) females, giving a M:F ratio of 1.4:1. As shown in table 2, most of the respondents were married, living with their nuclear family, had attained secondary level of education and reside in an urban dwelling. Trading was the commonest occupation while the average monthly income was less than N100,000 in 57(95.0%) households.

Table 1: Sociodemographic characteristics of the study population

Sociodemographic characteristic	**Freq (%)**
Age category	
Young	9(15.0)
Middle aged	39(65.0)
Elderly	12(20.0)
Marital Status	
Single	12(20.0)
Married	33(55.0)
Separated	3(5.0)
Widow/Widower	4(12)
Living status	
Living alone	9(15.0)
Living with nuclear family	30(50.0)
Living with extended family	21(35.0)
Education	
No formal education	3(5.0)
Primary	12(20.0)
Secondary	39(65.0)
Tertiary	3(5.0)
Postgraduate	3(5.0)
Domicile	
Rural	6(10.0)
Urban	54(90.0)
Occupation	
Unemployed	12(20)
Unskilled labourer	5(8.3)
Pensioner	8(13.3)
Office worker	6(10.0)
Professional	6(10.0)
Housewife	4(6.7)
Trading	19(31.7)
Social class	
1: Senior public servants, Professionals, Managers, Large Scale traders, businessmen and contractors	3(5.0)
2: Intermediate grade public servants and senior schoolteachers	11(18.3)
3: Junior schoolteachers, professional drivers, artisans	7(11.7)
4: Petty traders, labourers, messengers	23(38.3)
5: Unemployed, Full time housewife, students and subsistence farmers	16(26.7)
Average monthly income of household (Naira)	
<20,000	22(36.7)
20,000-49,000	8(13.3)
50,000-99,000	27(45.0)
100,000-199,000	2(3.3)
>200,000	1(1.7)
TOTAL	**60(100)**

None of the respondents were currently using tobacco in any form although 11(18.3%) of them admitted to current (regular) use of alcohol.
At the point of assessment, 24(40%) persons were in NYHA functional Class 1 with 16 persons in both Classes 2 and 3. A total of 32(53.3%) persons had not been hospitalized within the past one year for management of heart failure, 26(43.3%) had been admitted once and 2(3.3%) persons had been admitted twice. Duration of heart failure was less than a year in 28(46.7%) persons and more than a year in 32(53.3%); whereas 39(65.0%) were hypertensive and 4(6.7%) were living with diabetes mellitus.

Figure 1: New York Heart Association Functional Classification of Heart Failure of respondents



Adherence to heart failure medication was good as the majority of the respondents -46(76.7%) claim to take their medication every day of the week, 10(16.7%) take medication most days of the week while 4(6.7%) take medication on a few days in a week.

The mean Patient Health Questionnaire-9 score was 11.52±5.11 (range 2 to 20) and the prevalence of depression was 65.0% as 39 respondents had a PHQ-9 score≥10; of which, 20 (33.3%) persons had mild depression, 12(20.0%) and 7(11.7%) persons had moderate and severe depression respectively.

Socio demographic and clinical indices significantly associated with depression (table 3) include increasing age, female gender, educational level and a higher NYHA functional class.

With regression analysis, after adjusting for other variables, level of education AOR 6.27(95%CI=1.76-22.36; p=0.005) was the predictor of depression in this cohort of heart failure patients.

Table 2: Sociodemographic and Clinical indices associated with Depression

Parameter	Depression present n(%) N=39	Depression absent n(%) N=21	χ^2	p-value
Age group				
Young	3(7.7)	6(26.6)	7.732	0.021
Middle age	25(64.1)	14(66.7)		
Elderly persons	11(28.2)	1(4.8)		
Gender				
Male	18(46.2)	17(81.0)	6.801	0.009
Female	21(53.8)	4(19.0)		
Marital Status				
Single	6(15.4)	6(28.6)	4.855	0.183
Married	20(51.3)	13(61.9)		
Separated	3(7.7)	0(0)		
Widow/Widower	10(25.6)	2(9.5)		
Living status				
Living alone	6(15.4)	3(14.3)	8.257	0.16
Living with nuclear family	17(43.6)	13(61.9)		
Living with extended family	16(48.7)	5(23.8)		
Education				
No formal education	2(5.1)	1(4.8)	14.945	0.005
Primary	11(28.2)	1(4.8)		
Secondary	26(66.7)	13(61.9)		
Tertiary	0(0)	3(14.3)		
Postgraduate	0(0)	3(14.3)		
Average monthly income of household (Naira)				
<20,000	18(46.2)	4(19.0)	7.519	0.111
20,000-49,000	4(10.3)	4(19.0)		
50,000-99,000	15(38.4)	12(57.1)		
100,000-199,000	2(5.1)	0(0)		
>200,000	0(0)	1(4.8)		
NYHA Classification				
Class 1	17(43.6)	7(33.3)	30.513	<0.001

Class 2	2(5.2)	14(66.7)		
Class 3	16(41.0)	0(0)		
Class 4	4(10.3)	0(0)		
Number of hospitalizations in last 1year				
None	18(46.2)	14(66.7)	2.899	0.235
1	19(48.7)	7(33.3)		
2	2(5.2)	0(0)		
Duration of heart failure				
Less than a year	16(41.0)	12(57.1)	1.425	0.233
Greater than 1 year	23(59.0)	9(42.9)		

Discussion

Depression has been reported to be a major contributor to the morbidity and mortality in heart failure[14,16]. The prevalence of depression in this study was 65%, of which, 11.7% of heart failure patients had severe depression. This is similar to the prevalence reported in other studies in the United Kingdom[17] and Ethiopia[11,18] where depression was reported to be present in more than half of patients with heart failure but much higher than the reported prevalence of 22.1%[19] in Japan. Various factors may influence the reported prevalence of depression including the method of diagnosing depression and patient related variables such as the age, gender, severity of HF, and inpatients versus outpatients. Depression occurred more in women (53.8%) in this study and Yazew et al[11] in a similar study in heart failure reported that women were 2.7 times more likely to develop depression. Almost all patients with depression in this study (92%) were above 45years and this is in keeping with various studies which have reported a significant association with depressive symptoms and increasing age.[13,20] Jiang et al[13] noted that advanced age was associated with higher mortality and readmissions and concluded from their study that patients with major depression were more than twice as likely as heart failure patients without depression to die or be readmitted within 3 months to 1 year after hospitalization.

Almost all participants with depression had primary and secondary education versus those with no formal education and tertiary/post graduate education. This may be a combination of increased knowledge and awareness of the disease burden of heart failure in conjunction with inadequate average monthly income of their household to assess health services in Nigeria as the majority of patients pay out of pocket for health care. The average monthly combined household income in this study was <N100,000 ($235.59, official exchange rate, September 2022) in 95% of respondents.

The clinical status of the respondents was also associated with the presence of depression. Over two thirds of patients with heart failure duration of greater than one year had depression while all respondents who reported with ≥2 hospitalizations for heart failure in the past one year had a PHQ-9 score ≥10. Zahid et al[21] reported that admission in a hospital for HF at least once in the past two months was an independent predictor of depression. Also, an African study[11] reported the association between duration of HF and presence of depression as after controlling possible confounding effects of other covariates, duration of heart failure had a significant association with heart failure. Other social factors that were found to be significantly associated with HF included currently smoking and poor social support[11].

The NYHA functional class was significantly associated with depression in this study as all the respondents in functional class 3 and 4 had depression. The occurrence of depressive symptoms in heart failure patients with worse NYHA functional class was well elucidated in the meta-analysis by Rutledge et al[6] where they reported depression prevalence rates as high as 42% of patients in class 4 versus 11% in patients with class 1 HF and the authors concluded that depression rates are higher in more advanced HF, and HF severity had the greatest impact on depression rates. Zahid et al[21] also described the

significant association between high rates of depression and NYHA class 3 and 4, while also concluding that living without a partner and lack of a joint family system were other important predictors of depression. Although an older study by Jiang et al[13] reported an increased mortality at 3 months and 1 year in HF patients with major depression, as well as increased readmission rates at 3 months at 1 year, the authors summarized that these increased risks were independent of NYHA functional class as well as age of the respondents.

Limitations

This was cross sectional study with an inherent risk of coincidence findings
The sample size was small. A larger sample size may be required to attain more comprehensive results.

Conclusion

Depression is common in heart failure with a significant negative impact on overall disease burden. Prompt and accurate diagnosis may prompt clinicians to offer treatment, which in turn could improve health practices, enhance involvement in HF treatment, and ultimately improve clinical outcomes.

Authors' contribution: Boma Oyan.: Guarantor, concept, design, data analysis, manuscript preparation. Sarah Abere: Literature search. Ernest O. Nwazor: Design. Ovundah E. Nyeche: Manuscript editing. Marcel F. Jumbo: Data acquisition

Disclosure of conflict of interest: The authors declare no conflict of interest

Statement of informed consent: A written informed consent was obtained from the proposed study participants before recruitment in accordance with ethical principles

Statement of Ethical approval: Ethical approval was given by the Hospital's Health Research Ethics Committee (RSUTH/REC/2022178)

Sponsorship and Financial Support: The research received no external financial support

References

1) Jessup M, Brozena S. Heart failure. N Engl J Med. 2003 May 15;348(20):2007-18. doi: 10.1056/NEJMra021498.

2) Global Burden of Disease Study 2013 Collaborators. Global, regional, and national incidence, prevalence, and years lived with disability for 301 acute and chronic diseases and injuries in 188 countries, 1990-2013: a systematic analysis for the Global Burden of Disease Study 2013. Lancet. 2015;386(9995):743-800. doi:10.1016/S0140-6736(15)60692-4

3) Ponikowski P, Voors AA, Anker SD, Bueno H, Cleland JG, Coats AJ, Falk V, González-Juanatey JR, Harjola VP, Jankowska EA, Jessup M, Linde C, Nihoyannopoulos P, Parissis JT, Pieske B, Riley JP, Rosano GM, Ruilope LM, Ruschitzka F, Rutten FH, van der Meer P. 2016 ESC Guidelines for the diagnosis and treatment of acute and chronic heart failure: The Task Force for the diagnosis and treatment of acute and chronic heart failure of the European Society of Cardiology (ESC). Developed with the special contribution of the Heart Failure Association (HFA) of the ESC. Eur J Heart Fail 2016; 18: 891– 975.

4) Yancy CW, Jessup M, Bozkurt B, Butler J, Casey DE, Drazner MH, Fonarow GC, Geraci SA, Horwich T, Januzzi JL, Johnson MR, Kasper EK, Levy WC, Masoudi FA, McBride PE, McMurray JJV, Mitchell JE, Peterson PN, Riegel B, Sam F, Stevenson LW, Tang WH, Tsai EJ, Wilkoff BL; American College of Cardiology Foundation; American Heart Association Task Force on Practice Guidelines. 2013 ACCF/AHA Guideline for the management of heart failure: a report of the American College of Cardiology Foundation/American Heart Association Task Force on Practice Guidelines. J Am Coll Cardiol 2013; 62: e147– e239.

5) Y. Lu, C. Tang, C. S. Liow, W. W. Ng, C. S. Ho, and R. C. Ho, "A regressional analysis of maladaptive rumination, illness perception and negative emotional outcomes in Asian patients suffering from depressive disorder," Asian Journal of Psychiatry, vol. 12, pp. 69–76, 2014.

6) Rutledge T, Reis VA, Link SE. Depression in heart failure: a meta-analytic review of prevalence, intervention effects and associations with clinical outcomes. J Am Coll Cardiol. 2006; 48:1527–1537. 10.1016/j.jacc.2006.06.055

7) Zigmond AS, Snath RP. The hospital anxiety and depression scale. Acta Psychatr Scand. 1983; 67:361–370

8) Hamilton M. Development of a rating scale for primary depressive illness. Br J Soc Clin Psychol. 1967; 6:278–246

9) Lipman RS, Covi L, Shapiro AK. The Hopkins symptom checklist (HSCL)-factors derived from the HSCL-90. J Affect Disord. 1979; 1:9–24

10) A. Hailu, A. Mandush, K. K. Berhe, H. B. Gebru, and A. Aregay, "Assessment of depression prevalence and its determinants among adult patients admitted in governmental hospitals, Mekelle, Tigray, Ethiopia, 2012," A Cross-sectional Study. Stress. 2012;45(6):7-8.

11) Yazew KG, Beshah DT, Salih MH, Zeleke TA. Factors Associated with Depression among Heart Failure Patients at Cardiac Follow-Up Clinics in Northwest Ethiopia, 2017: A Cross-Sectional Study. Psychiatry J. 2019 Jul 21; 2019:6892623. doi: 10.1155/2019/6892623. PMID: 31428624; PMCID: PMC6679871.

12) Marco Sbolli, Mona Fluzat, Dario Cani, Christopher M O'Connor. Depression and heart failure: the lonely comorbidity. European Journal of Heart Failure - Wiley Online Library [Internet]. 2020. [cited 2022 Apr 7]. Available from: https://onlinelibrary.wiley.com/doi/full/10.1002/ejhf.1865

13) Jiang W, Alexander J, Christopher E, et al. Relationship of Depression to Increased Risk of Mortality and Rehospitalization in Patients With Congestive Heart Failure. Arch Intern Med. 2001;161(15):1849–1856. doi:10.1001/archinte.161.15.1849

14) Mbakwem A, Aina F, Amadi C. Expert Opinion-Depression in Patients with Heart Failure: Is Enough Being Done? Card Fail Rev. 2016 Nov;2(2):110-112. doi: 10.15420/cfr.2016:21:1. PMID: 28785463; PMCID: PMC5490872.

15) Celano CM, Villegas AC, Albanese AM, Gaggin HK, Huffman JC. Depression and Anxiety in Heart Failure: A Review. Harv Rev Psychiatry. 2018 Jul/Aug;26(4):175-184. doi: 10.1097/HRP.0000000000000162. PMID: 29975336; PMCID: PMC6042975

16) Amanda R. Moraska, Alanna M. Chamberlain, Nilay D. Shah, Kristin S. Vickers, Teresa A. Rummans, Shannon M. Dunlay et al. Depression, Healthcare Utilization, and Death in Heart Failure; A Community Study. Circulation: Heart Failure. 2013; 6:387–394 doi.org/10.1161/CIRCHEARTFAILURE.112.000118

17) A. M. Yohannes, T. G. Willgoss, R. C. Baldwin, and M. J. Connolly, "Depression and anxiety in chronic heart failure and chronic obstructive pulmonary disease: prevalence, relevance, clinical implications and management principles," International Journal of Geriatric Psychiatry, vol. 25, no. 12, pp. 1209–1221, 2010.

18) A. Hailu, A. Mandush, K. K. Berhe, H. B. Gebru, and A. Aregay, "Assessment of depression prevalence and its determinants among adult patients admitted in governmental hospitals, Mekelle, Tigray, Ethiopia, 2012," A Cross-sectional Study. Stress, vol. 45, no. 6, pp. 7-8, 2012

19) Y. Shimizu, M. Suzuki, H. Okumura, and S. Yamada, "Risk factors for onset of depression after heart failure hospitalization," Journal of Cardiology, vol. 64, no. 1, pp. 37–42, 2014.

20) Sutin AR, Terracciano A, Milaneschi Y, An Y, Ferrucci L, Zonderman AB. The trajectory of depressive symptoms across the adult life span. JAMA Psychiatry 2013; 70: 803– 811.

21) Zahid I, Baig MA, Ahmed Gilani J, Waseem N, Ather S, Farooq AS, Ghouri A, Siddiqui SN, Kumar R, Sahil, Suman, Kumar R, Kumar R, Mulla AA, Siddiqi R, Fatima K. Frequency and predictors of depression in congestive heart failure. Indian Heart J. 2018 Dec;70 Suppl 3(Suppl 3): S199-S203. doi: 10.1016/j.ihj.2018.10.410.