

**ASSOCIATION BETWEEN QUALITY OF LIFE AND ANXIETY, DEPRESSION, AND PHYSICAL PERFORMANCE IN CONGESTIVE HEART FAILURE PATIENTS**

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**ABSTRACT**

**Background:** Quality of life is a comparatively new scientific measure to assess the effectiveness of treatment approaches and the progress of a disease. Depression and anxiety are two important psychological disorders and are very common in patients with heart failure. In the present study, to assess physical performance in CHF patients, we conducted a cross-sectional study of the frequency and severity of impaired QOL scores and their relationship with physical performance. **Method:** This was a cross-sectional, non-interventional study. All 72 CHF patients were recruited during June 2005 to March 2006 from the department of cardiology and Department of Psychiatry, Mahatma Gandhi Medical College & Hospital, Jaipur, Rajasthan. NYHA classification was used to assess the CHF severity by a cardiologist. SF-36, Beck Anxiety Inventory (BAI), and the Beck Depression Inventory (BDI)-II and 6-MWT study tools were used for quality of life, depression, anxiety and physical performance in CHF patients respectively. **Results:** Most of the patients were male (91.67%) and unemployed or retired (80.83%). The majority of the patients (83.3%) were in NYHA functional class II or III, and, 32% a six-minute walk test of < 450 m. There were significantly reduced NYHA scores in all aspects of quality of life and SF-36 scores from NYHA class I to class III was a gradually drop. CHF patients who had neither anxiety nor depression had significantly more impaired 6-MWT. **Conclusion:** The findings of this study suggest important directions for planning effective care to enhance QoL in CHF patients. We have identified the detrimental impact of psychological distress on QoL in these patients. Psychological interventions that are effective in reducing depression should be identified.

**Keywords:** congested heart failure, cardiomyopathy-targeted areas, Beck Depression Inventory, psychological distress.

**INTRODUCTION:**

Quality of life is a comparatively new scientific measure to assess the effectiveness of treatment approaches and the progress of a disease.<sup>1</sup> In congestive heart failure, several disease-specific study tools—such as Minnesota living with heart failure questionnaire<sup>4</sup>—have proved useful in clinical studies. (2) Drawbacks of these specific

tools are that they are challenging to compare across diseases and with controls in the general population. Because they are planned to measure specific aspects of a certain disease, unpredicted side effects of treatment might go unobserved. Recently, quality of life was shown to be declined in patients with congestive heart failure in comparison with the general population, using

the medical outcome study 36 item short form health survey (SF-36), a validated, reliable, and a multidimensional generic measure of the quality of life. (3)

Depression and anxiety are two important psychological disorders and are very common in patients with heart failure. Prevalence of depression has been reported as ranging from 15 to 36% in patients with heart failure which is more than the lifetime prevalence of 13% for major depression in the general population.<sup>4</sup> Anxiety has been found in 29 to 45% of patients with heart failure (5-6).

Depressive symptoms seem to be often under-diagnosed or inadequately treated by General Physicians whoever their association with adverse cardiac outcome in heart failure as well as ischemic heart disease. <sup>7</sup> While each & every heart failure, an acute, temporary depressive, or anxious reaction shall be seen as a normal response, chronic depressive or anxious symptoms should be examined more strictly.<sup>8</sup> Little responsiveness is given to predictive which prognostic factors for psychological comorbidity of heart failure should be included in a primary care setting.

In the present study, to assess physical performance in CHF patients, we conducted a cross-sectional study of the frequency and severity of impaired QOL scores and their relationship with physical performance.

## **METHODS**

### **1.1 Study participants**

This was a cross-sectional, non-interventional study. All CHF patients were recruited during June 2005 to March 2006 from Department of Cardiology and Department of Psychiatry, Mahatma Gandhi Medical College & Hospital, Jaipur, Rajasthan during.

Inclusion criteria for recruitment of CHF patients were as follows: (1) age,  $\geq 18$  years; (2) CHF vintage,  $\geq 6$  months; (3) CHF treatment regularly; (4) no hospitalizations during the previous 3 months (5) able to ambulate and ability to complete all study protocol tests and wear the physical activity monitor for 10 days; (6) no amputations or prostheses in lower extremities and (7) good compliance to study protocol. Exclusion criteria included (1) any acute viral & bacterial infections or other inflammatory illnesses, (2) MI or angina pectoris within the past 12 months (3) active malignancy, and (4) current heart or lung failure or severe liver disease.

At the time of the study, this center was treating eligible 72 CHF patients. NYHA classification was used to assess the CHF severity by a cardiologist. The NYHA classifies CHF into classes based on functional limitations/restriction and severity: Class I (normal)—few observable symptoms, no in ordinary physical activity; Class II (mild)—mild observable symptoms; slight limitation during ordinary activity and comfortable at rest; Class III (moderate)—marked limitation in physical activity due to symptoms even during less-than-ordinary activity; comfortable only at rest; Class IV (severe)—end-stage heart failure; severe limitations; experience symptoms even while at rest. This study was approved by the ethical committee of Mahatma Gandhi Medical College & Hospital, Jaipur. All subjects gave informed written consent.

All participants made one visit to the Outpatient of Department of Cardiology, Mahatma Gandhi Medical College & Hospital, Jaipur and where they go through a 6-minute walk test (6-MWT), and complete questionnaires.

## Quality of Life (QOL) assessment

In the present study, the Medical Outcomes Study Short Form-36 (SF-36, a generic instrument) was used to the psychometric evaluation of QoL (Ferreira 2000a, b). The questionnaire consists of the generic 36-Item Short Form Health Survey (SF-36) as well as 23 multi-item scales focusing on quality of life issues specific to patients with chronic cardiac disease (cardiomyopathy-targeted areas). Thirty-five items of the SF-36 are organized into 8 quality of life dimensions. One item, self-reported health transition, is not considered relevant to these 8 dimensions. This tool produces two summary measures health: the physical health composite score and mental health composite score. (9)

## Anxiety and Depression Questionnaires

Participants completed the Beck Anxiety Inventory (BAI), and the Beck Depression Inventory (BDI)-II 10 In BAI, There was a 21-item self-report inventory for assessing the severity of clinical anxiety. Respondents rate each item during the past week on a 4- point scale ranging from 0 (“Not at all”) to 3 (“I could barely stand it”) with regard to their anxiety related symptoms. The BAI, the total scores can range from 0 to 63 by summing the severity ratings across all 21 items. Scores are considered to indicate the following: 0-7, minimal anxiety; 8-15, mild anxiety; 16-25, moderate anxiety; 26-63, severe anxiety. Similarly, the BDI is a 21-item inventory to measure the severity of depressive symptoms and total scores can range from 0 to 63. All 21 items are rated from 0 to 3, and respondents are asked to rate their depressive symptoms during the previous two weeks. BDI scores are considered to indicate the following: 0-13, minimal depression; 14-19, mild depression; 20-28, moderate depression; 29-63, severe depression.

## Physical performance tests

The 6-minute walking test was conducted for physical performance. The 6-MWT measured the distance (meters) that during a 6-min period of time, participants walked back and forth along an 80-foot horizontal corridor while they were repetitively encouraged to walk fast. Study participants could slow down, rest, or even stop walking if they wished, but the 6-min timer was kept running.

## Statistical analyses

Statistical analyses were performed and variables were expressed as the mean  $\pm$  standard deviation (SD) and were compared between CHF and normal control group by a Student's t-test for independent samples. Categorical variables of three groups were compared using a one-way analysis of variance (ANOVA). Comparisons between two groups were made using a 2-tailed t-test. In some cases, analyses were further adjusted for anxiety and depression status. A P-value of  $<0.05$  was considered to indicate statistical significance.

## RESULTS

### Characteristics of the Study Sample

Table 1 showed the demographic data and functional variables in all the patients with congestive heart failure. Most of the patients were male (91.67%) and unemployed or retired (80.83%), despite the fact that their mean age was rather low, with 88.8% of the patients being younger than 62 years of age (range 25–79 years). The majority of the patients (83.3%) were in NYHA functional class II or III, and, 32% a six-minute walk test of  $< 450$  m.

**Table 1 Characteristics of 72 patients with Congestive Heart Failure**

Characteristic	Value
Age (years)	52.9 (12.6)
Sex	
Female	6 (8.33%)
Male	66 (91.67%)
Employment	
Employed	21 (19.17%)
Unemployed/retired	51 (80.83%)
Diagnosis	
Coronary Artery Disease (CAD)	13 (18.05%)
Dilated cardiomyopathy	42 (58.33%)
Dilated cardiomyopathy with concomitant CAD	5 (6.94%)
Other	2 (2.79%)
Duration of CHF (years)	5.3 ±6.2
NYHA functional class	
Class I	12 (16.67%)
Class II	39(54.17%)
Class III	21(29.16%)
Six-minute walk test (m)	496±103

**Table 2: Comparison of SF-36 scales in heart failure patients in different functional classes, and between heart failure patients**

SF-36 scales		NYHA class			Total <sup>d</sup>
		I <sup>a</sup> (n=51)	II <sup>b</sup> (n=14)	III <sup>c</sup> (n=7)	N=72
<b>Physical functioning</b>	Mean ±SD	79.4	56.6	29.2	48.2
	Significance	20.3 b,c	21.4 a,c	20.1 a,b	26.6
<b>Role-physical</b>	Mean	60.3	28.8	10.6	25.4
	SD	41.2	37.3	26.5	37.1
	Significance	b,c	a,c	a,b	
<b>Bodily pain</b>	Mean	85.8	65.5	52.6	62.8
	SD	20.1	28.7	33.2	30.2
	Significance	b,c	a,c	a,b	
<b>General health</b>	Mean	63.6	44.4	31.3	41.2
	SD	16.6	16.2	14.0	18.8
	Significance	b,c	a,c	a,b	
<b>Vitality</b>	Mean	61.1	49.3	29.2	42.6
	SD	18.9	19.3	16.9	21.6
	Significance	c	c	a,b	
<b>Social functioning</b>	Mean	80.4	75.3	57.1	68.3
	SD	19.5	23.8	27.2	26.7
	Significance	c	c	a,b	
<b>Role-emotional</b>	Mean	76.2	55.0	32.8	48.8
	SD	38.6	45.6	43.6	46.1
	Significance	c	c	a,b	
<b>Mental health</b>	Mean	73.8	66.2	51.3	61.1
	SD	19.2	17.8	20.2	20.6
	Significance	c	c	a,b	

Significance (a,b,c,d ):  $p < 0.05$  by t-tests between groups with the designated letters and NYHA I (a), NYHA II (b), NYHA III (c), an entire heart failure population (d).

NYHA class III had approximately one-third of the scores physical functioning, role functioning

physical, bodily pain, general health, vitality, and role functioning emotional as compared to the healthy population. NYHA class III patients reached a minimum mean SF-36 score in physical role functioning of only 10.7%, compared with 96.9% in the healthy population (table 2).

**Table 3. Physical Performance According to Anxiety and Depression Status in CHF Patients**

Physical Performance	CHF Patients A-D-	CHF Patients A-D+	CHF Patients A+D-	CHF Patients A+D+	Differences Among CHF Patients* P Value
n (male/female)	32 (18/12)	14 (8/6)	11 (10/1)	17 (13/4)	.182
Age, y	50.3 ± 13.8	54.5 ± 10.4	52.8±12.6	53.6 ± 14.0	0 .726
Percentage diabetic	23	50	36	35	.037
6-min walk distance (m)	466±119	397±166	478±124	410±122	.013

A-D-, subjects displaying neither anxiety nor depression; A+D+, those displaying anxiety and depression; A+D-, those displaying anxiety but not depression; A-D+, those displaying depression but not anxiety; CHF, congested heart failure. Data are presented as mean±standard deviation.

\*ANOVA. Physical performance P values adjusted for age, gender, the presence of diabetes,

The fraction of diabetic CHF patients who had anxiety but not depression was greater than the proportion with neither anxiety nor depression. As compared with normal controls without anxiety or depression, CHF patients who had neither anxiety nor depression had significantly more impaired 6-MWT. There were associations between anxiety, depression, or a combination of anxiety and depression and reduced physical performance among CHF patients (Tables 3).

## DISCUSSION

Our aim in the present study showed a detailed analysis of the relation between quality of life, psychiatric morbidity and physical performance. With NYHA functional class, all components of quality of life decreased, the most noticeable loss of quality of life being observed in the domains of physical functioning, role function emotional and role function physical. Classes II and III all aspects of quality of life were dramatically decreased according to NYHA, showing the severe impact of congestive heart failure on daily life.

Anxiety and/or depression were selected in the present because anxiety and depression are closely interrelated and indicate different manifestations of psychosocial distress. These might have fairly dissimilar effects on cardiac prognosis; recent research has shown a clustering of undesirable effects to be more strongly related to cardiovascular disease outcomes than specific

effects alone. One of the prognostic factors which can easily be assessed in the everyday consultation is social support. Lack of social support is known to be associated with enhance the risk of mortality. (11) The results suggest that a lack of social support is also an important prognosticator for psychosocial distress. Krumholz, et al<sup>12</sup> found among older hospitalised patients with heart failure, an absence of emotional support was a strong, independent predictor of fatal cardiac outcomes. Boyle et al analyzed that 13.1% of the patients had increased levels of baseline, 23.7% had a clinically-relevant depression (follow up anxiety 13.4%; follow up depression 26.1%). Depression is independently related to poor outcomes by physiologic alterations that include neuro-hormonal activity, increased pro-inflammatory activity, and changes in platelet activation and behavioural mechanisms including decreased faithfulness to treatment. QoL may be related to poor consequences through same mechanisms (York et al. 2008). A study by Faller et al. (2009) examined whether depression and CHF severity (assessed by the NHYA functional class) were independent predictors of both the physical and psychological domains of QoL Havranek et al. (2004) evaluated the predictors of the onset of depression in 245 patients in one year of follow-up. According to these authors, the identification of CHF patients who are at risk for the development of depression is important because of the association between depression and increase the risk of mortality, hospitalization, worsening of CHF symptoms, functional status, and QoL.

Social isolation was a significant predictor of mortality in heart failure outpatients, even after controlling for depressive symptoms, heart failure severity, functional status, and age<sup>13</sup>.

This is not surprising, as in chronic heart failure patients we are used to seeing dissociation

between cardiac and peripheral function. On average, our patients had had symptoms for about 4 years. Thus peripheral deconditioning could also explain the lack of correlation between cardiac dysfunction and capacity to perform a daily task such as walking. Although the distance walked during the test is usually considered an index of submaximal exercise capacity, we found that its relationship to the anaerobic threshold is poor.

Indeed, some authors<sup>14-16</sup> showed that the peak VO<sub>2</sub> in chronic heart failure patients during the 6-min walk test was alike to that extended during the cardiopulmonary exercise test and a comparable anaerobic threshold was also identified<sup>14</sup>. Cahalin et al.<sup>17</sup> observed that in some cases, during the 6-min test the maximal heart rate and blood pressure were reached near their own peak values at maximal exercise test. Therefore, instead of being a measure of submaximal capacity, in some cases, the 6-min test may reflect maximal exercise tolerance and the energy required may also be provided by anaerobic metabolism.

## CONCLUSION

The findings of this study suggest important directions for planning effective care to enhance QoL in CHF patients. We have identified the detrimental impact of psychological distress on QoL in these patients. Psychological interventions that are effective in reducing depression should be identified. According to our results, future research should also include an exploration of which variables are responsible for gender differences; evaluation of the aspects of social activity and women's ability to perform some habitual activities; development of programs that will assist women in improving their QoL.

In addition, it is important to assess CHF patients' own perception of health and identify

interventions to improve this perception with greater consideration of behavioural, social and environmental factors (Clark et al. 2003).

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