

Assessing the Psychological Impact and Quality of Life in Patients with Dilated Cardiomyopathy Attending Alshaab Teaching Hospital, Khartoum, Sudan

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Abstract

Introduction: Cardiomyopathy refers to a group of heart conditions characterized by abnormal structure of the myocardium. Dilated cardiomyopathy is the most common cause of heart failure in Sudan. It has different implications for the quality of life and the psychological status of patients. This study aims to assess the Psychological Impact and Quality of Life in Patients with Dilated Cardiomyopathy (DCM). **Methods:** A descriptive cross-sectional hospital-based study was conducted in the outpatient department of Alshaab teaching hospital. A sample of 107 patients diagnosed with dilated cardiomyopathy (DCM). Using self-administered questionnaires including socio-demographic data, the Hospital Anxiety and Depression Scale (HADS), and the WHOQOL-BREF. The study assessed the quality of life and psychological symptoms of participants using descriptive statistics, t-tests, and ANOVA to explore associations between clinical and sociodemographic factors and QoL outcomes. **Results:** The study showed that 23 (21.5%) patients had anxiety, and 19 (17.8%) patients had depression. Regarding the four domains related to quality of life, the physical health domain had the lowest mean score (56.15), indicating significant physical limitations, while the social domain scored highest (68.55), reflecting strong social support. Most participants were middle-aged, predominantly male, married, and residing in urban areas, with the majority reporting sufficient income. Higher NYHA class and lower LVEF were significantly associated with poorer physical and psychological quality of life, emphasizing the impact of heart failure severity. Employment and sufficient income were linked to better physical, psychological, and environmental scores. Mental health issues were prevalent, with 21.5% experiencing anxiety and 17.8% depression; these conditions significantly correlated with lower psychological and social QoL scores. **Conclusion:** Dilated cardiomyopathy affects patients' psychological status and their quality of life. In this study, sociodemographic and clinical factors considerably influenced the participants' quality of life, underscoring the need for comprehensive management approaches addressing both medical and psychosocial aspects.

Keywords: Dilated Cardiomyopathy, Hospital Anxiety and Depression Scale, and Quality of Life.

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INTRODUCTION

Cardiomyopathies are diseases considered a group of pathologies characterized by structural and functional alterations of the heart muscle, making it structurally and functionally abnormal (Abelmann, 1984; Ciarambino *et al.*, 2021). According to the WHO and the International Society and Federation of Cardiology, cardiomyopathies are classified into three types: dilated, hypertrophic, and restrictive. Hypertrophic cardiomyopathy is a genetic disorder, whereas dilated cardiomyopathy (DCM) is inherited in about one-third of cases (Varma *et al.*, 2014). Dilated cardiomyopathy (DCM) is characterized by the

enlargement of both ventricles, reduced contractility, inflammation, and degeneration of myocardial fibers, leading to ventricular dilation, impaired pumping ability, atrial enlargement, and blood stasis in the left ventricle (Kumar, 2002).

Restrictive cardiomyopathy is the least common type, which impairs relaxation but leaves contraction unaffected (Shanya *et al.*, 2025). DCM is more commonly seen in men than in women, occurring mostly in adults between the ages of 20 to 60 years. Its prevalence in the general population is estimated at 36 cases per 100,000 (Wang *et al.*, 2016). Currently, it is responsible for approximately 46,000 hospitalizations

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each year in the United States (Manolio *et al.*, 1992). DCM is a common cause of heart failure in many African countries and occurs in 37.4% of cases in Guinea and 28% in Senegal (Kengne *et al.*, 2008). Sudan, it is one of the leading causes of heart failure, the prevalence was found to be 43.1% of inpatient admissions with heart failure (Noma *et al.*, 2017) and 6% of all cardiac admissions, while in the cardiology unit at AlShaab Teaching Hospital in Khartoum, 12% of all admissions in 2009 were due to idiopathic DCM (Suliman, 2011).

The connection between the heart and mind has been recognized for a long time. Common symptoms such as tachycardia, palpitations, and even chest pain during anxious situations can influence emotional responses in cardiovascular events (Levine *et al.*, 2021). Similarly, as cardiomyopathy progresses, it can impair both physical and mental functions. Physically, patients may experience chest pain, fatigue, shortness of breath, difficulty performing daily activities, and fainting. Psychologically, they may suffer from depression, anxiety, mood disorders, social withdrawal, sleep problems, feelings of loss, and limitations in social interactions, leading to feelings of isolation or being seen as weak. These symptoms often impact relationships and family dynamics and make it challenging to adapt to new situations or lifestyle changes. Overall, these issues can significantly reduce a patient's daily functioning and quality of life (Morgan *et al.*, 2008).

This study aimed to assess the psychological impact and quality of life among patients with dilated cardiomyopathy attending AlShaab Teaching Hospital in Khartoum, Sudan. The outcomes of the study can help Healthcare professionals need to understand the outcomes of patients with cardiomyopathy to deliver appropriate physical and psychological care, prevent potential complications, and enhance their overall quality of life.

METHODS

Study design, area, and population

A descriptive cross-sectional study was done in the cardiac outpatients' clinic in Alshaab Teaching Hospital, Khartoum state, Sudan. Alshaab Teaching Hospital is a tertiary governmental public hospital located in the center of Khartoum and receives referrals from all over the country. It has more than 280 total beds with 100 dedicated to cardiology, and it has a cardiac emergency room that runs 24 hours, three general wards, two high dependency units, one coronary care unit, one intensive care unit, one catheterization laboratory room, two cardiothoracic operation rooms, three echocardiography clinics, and six cardiac outpatient clinics per week. A study was done among patients diagnosed with DCM who attended the cardiac outpatients' clinic in the Hospital during the period of the study.

All patients diagnosed with dilated cardiomyopathy, of both sexes and aged 18 years and older, were included in the study. The patients who refused to participate, those with cognitive impairment, individuals with severe illness, and patients with ischemic dilated cardiomyopathy were excluded from this study.

Measurement tools, data collection, and data analysis

The researcher collected data using three self-administered questionnaires. When participants were illiterate or needed assistance, the researcher explained and helped them complete the questionnaires. The three questionnaires used were: Socio-demographic questionnaire, HADS (Hospital Anxiety and Depression Scale), and WHOQOL-BREF questionnaire.

The WHOQOL-BREF is a validated and reliable Arabic version of the WHO Quality of Life scale's short form, consisting of 26 questions (Ohaeri *et al.*, 2007). Developed by WHO, it assesses various life domains, with higher scores indicating better quality of life. The first two items, Overall Rating of QoL and Satisfaction with General Health, are not included in the domain scores. The remaining 24 items form four independent domains: Physical Health (7 items), Psychological Health (6 items), Social Relations (3 items), and Environment (8 items).

Each item is scored on a 5-point Likert scale, where 1 indicates a poor response and 5 indicates an excellent response. Items 3, 4, and 26 are reverse-scored. Domain scores are obtained by summing the raw scores of their respective items and then transforming these sums using a specified table. The mean scores of each domain are calculated for analysis.

Although the WHOQOL-BREF has been widely used in studying chronic illnesses in Sudan, it has not previously been employed in patients with heart diseases. There are no official WHO guidelines for defining cut-off points for poor or good quality of life; however, many researchers suggest using a mean score of 60 as a threshold for adequacy. The total coverage technique was used to select all patients with DCM from the cardiac outpatient clinic at Alshaab Teaching Hospital during the study period. The study included 107 patients.

In this study, there are two dependent variables (outcomes): the domains of quality of life (physical health, psychological health, social relationships, and environment) and Symptoms of depression and anxiety. Independent variables include sociodemographic and clinical characteristics (age, sex, marital status, educational level, residency area, employment status, income sufficiency, duration of illness, LVEF, and NYHA classification). For data analysis used using the Statistical Program of Social Science (SPSS) version 21 was used. Descriptive statistics were used to summarize

participants' demographic characteristics, domains of QoL, depression, and anxiety as frequency and percentages. Inferential statistics as the t-test, chi-square test, and ANOVA test, were used when it's deemed appropriate to correlate and test the association between variables (p value ≤ 0.05).

Ethical consideration

For this study, ethical clearance was obtained from the Ethical Committee of the Sudan Medical Specialization Council, No. 8771, and also from the Research Department of Khartoum State Ministry of Health. Directors of Alshaab Teaching granted us their permission to research their patients. Written informed consent was obtained from the patients themselves, informing them that participation is voluntary with privacy and confidentiality assured (by using codes), and in addition, participants have the right to withdraw at any time without any deprivation. Precautionary measures against COVID-19 were taken (wearing masks, maintaining a safe distance, and using hand sanitizers).

RESULTS

Table 1 shows that the average age was approximately 70 years, with a standard deviation of 15 years. The age distribution shows most patients are between 51 and 60 years old (31.8%), followed by 41–50 years (26.6%) and 61–70 years (15%). The majority of participants were male (64%), while females comprised (36%). Most patients were married (73.8%), with smaller groups being widowed (8.4%), divorced (11.2%), and single (6.5%). About 45.8% had primary education, (16.8%) had university-level education, (15.9%) completed secondary school, (11.2%) were illiterate, (5.6%) attended Khalwa, and 4.7% had post-university education. A slightly higher proportion of patients were unemployed (51.4%) compared to those who were employed (48.6%). Most lived in cities (76.6%), while (23.4%) lived in villages. The majority (94.4%) reported their income as sufficient, with only 5.6% indicating insufficiency.

Table 1: Sociodemographic Characteristics

Characteristics	Frequency (N=107)	Percentage (%)
Age	Mean: 69.9 years	SD \pm 15 years
31- 40	12	11.2
41- 50	28	26.6
51-60	34	31.8
61- 70	16	15.0
71-80	4	3.9
More than 81	13	5.6
Gender		
Male	68	64
Female	39	36
Marital Status		
Single	7	6.5
Married	79	73.8
Divorced	12	11.2
Widow	9	8.4
Education Level		
Illiterate	12	11.2
Khalwa	6	5.6
Primary	49	45.8
Secondary	17	15.9
University	18	16.8
Post-university	5	4.7
The current employment status		
Unemployed	55	51.4
Employed	52	48.6
Residency Distribution		
City	82	76.6
Village	25	23.4
The income sufficiency of patients with Dilated Cardiomyopathy (DCM)		
Sufficient	101	94.4
Insufficient	6	5.6

As shown in **Table 2**, among the 107 patients with Dilated Cardiomyopathy, about 25% had a duration

of illness less than 12 months, while the largest group (44.9%) experienced illness between 13 and 36 months,

and approximately 26% had been ill for 37 to 60 months; only 3.7% had an illness duration exceeding 60 months. When classified according to the New York Heart Association (NYHA), 31.1% were in Class I, 32.7% in Class II, the largest group at 40.2% in Class III, and 14% in Class IV. Regarding Left Ventricular Ejection Fraction (LVEF), most patients had reduced ejection

fractions: 33.6% ranged between 26-30%, 30.8% between 21-25%, 20.6% between 31-35%, and only 1.9% had an LVEF greater than 40%. The prevalence of depression was normal in 58.9%, borderline in 23.4%, and abnormal in 17.8%. Similarly, for anxiety, 57% of patients were normal, while 21.5% each fell into borderline and abnormal categories.

Table 2: Distribution and Clinical Characteristics of Patients with Dilated Cardiomyopathy (DCM)

Characteristics	Frequency (N=107)	Percentage (%)
Distribution of patients according to the duration of illness		
<12 months	27	25.23
13-36 months	48	44.86
37-60 months	28	26.17
>60 months	4	3.74
Distribution of patients according to the New York Heart Association (NYHA)		
Class I	33	31.1
Class II	35	32.7
Class III	43	40.2
Class IV	6	14
Distribution of patients according to the Left Ventricular Ejection Fraction (LVEF)		
>40%	2	1.9
36-40	8	7.5
31-35	22	20.6
26-30	36	33.6
21-25	33	30.8
<20	6	5.6
The prevalence of depression with Dilated Cardiomyopathy (DCM)		
Normal	63	58.9
Borderline	25	23.4
Abnormal	19	17.8
The prevalence of anxiety with Dilated Cardiomyopathy (DCM)		
Normal	61	57
Borderline	23	21.5
Abnormal	23	21.5

Table 3 shows the descriptive statistics for the quality of life (QOL) domains among 107 patients, showing that the physical domain scores ranged from 6 to 88, with a mean of 56.15 and a standard deviation of 14.17. The psychological domain scores ranged from 31 to 94, with a mean of 59.01 and a standard deviation of

11.20. The social domain scores varied between 25 and 94, with a mean of 68.55 and a standard deviation of 13.73. Lastly, the environmental domain scores ranged from 19 to 88, with a mean of 57.41 and a standard deviation of 13.48.

Table 3: The descriptive statistics of quality-of-life domains (N=107).

The QOL domains	N	Minimum	Maximum	Mean	Std. Deviation
Physical domain	107	6	88	56.15	14.168
psychological domain	107	31	94	59.01	11.195
social domain	107	25	94	68.55	13.726
environmental domain	107	19	88	57.41	13.476

Table 4 shows the association between quality of life, Gender, employment, and income. Gender does not significantly influence most quality of life (QOL) domains, except for the social domain, where females reported a significantly lower mean score (64.2) compared to males (71.0) (P-value =0.013). Regarding current employment status, employed patients had significantly higher mean scores across the physical

(62.04 vs. 50.58, P-value =0.000) and psychological domains (61.63 vs. 56.53, P- value=0.018) than unemployed patients; no significant differences were observed in social and environmental domains. When considering income sufficiency, patients with sufficient income scored significantly higher in the environmental domain (75.0 vs. 56.4, P-value=0.001), whereas differences in other domains were not statistically

significant. Overall, being employed and having sufficient income are associated with a better perceived

quality of life in certain domains, particularly physical, psychological, and environmental aspects.

Table 4: The association between quality of life, Gender, employment, and income.

The QOL domains	Gender		Independent-Samples t-test	
	Male	Female	T	Sig. (2-tailed)
	Mean	Mean		
Physical domain	55.82	56.72	- .313	0.75
Psychological domain	59.34	58.44	.40	0.690
Social domain	71.03	64.23	2.52	0.013*
Environmental domain	57.12	57.92	- .296	0.76
The QOL domains	The current employment status		Independent-Samples t-test	
	Unemployed	Employed	T	Sig. (2-tailed)
	Mean	Mean		
Physical domain	50.58	62.04	- 4.5	0.000*
psychological domain	56.53	61.63	- 2.4	0.018*
social domain	67.95	69.19	- .46	0.64
environmental domain	56.02	58.88	- 1.1	0.27
The QOL domains	The income sufficiency		Independent-Samples t-test	
	Insufficient	sufficient	T	Sig. (2-tailed)
	Mean	Mean		
Physical domain	55.51	66.83	- 1.92	0.057
psychological domain	58.99	59.33	- .073	0.94
social domain	68.60	67.67	.162	0.87
environmental domain	56.37	75.00	- 3.45	0.001*

Table 5 show the summarizes the impact of different factors (age group, NYHA class, and LVEF) on each QOL domain across the three analyses. The results indicated age, NYHA class, and LVEF significantly affect the physical aspect of quality of life, with higher

NYHA classes and lower LVEF linked to worse outcomes, highlighting the impact of heart failure severity. Only NYHA class significantly influences psychological health, while social and environmental domains are not strongly affected by these factors.

Table 5: ANOVA test for Factors Affecting Quality of Life Domains

Quality of Life Domain	Factor	Sum of Squares	Df	Mean Square	F value	P-value
Physical domain	Age group	6445.033	5	1289.007	8.777	0.000*
	NYHA classification	13022.357	3	4340.786	54.160	0.000*
	LVEF	6663.158	5	1332.632	9.210	0.000*
Phycological	Age group	217.616	5	43.523	0.336	0.890
	NYHA classification	1355.578	3	451.859	3.901	0.011*
	LVEF	456.435	5	91.287	0.719	0.611
Social	Age group	1858.837	5	371.767	2.073	0.075
	NYHA classification	1013.493	3	337.831	1.836	0.145
	LVEF	1028.528	5	205.706	1.097	0.367
Environmental	Age group	685.015	5	137.003	0.745	0.591
	NYHA classification	650.276	3	216.759	1.200	0.313
	LVEF	157.516	5	31.503	0.167	0.974

As shown in **Table 6**, the higher levels of anxiety and depression are linked to lower scores in the psychological (P-value = 0.000) and social aspects (P-value = 0.009) of quality of life, indicating worse mental

health and social functioning among affected individuals. These findings emphasize the importance of addressing mental health issues to enhance overall quality of life.

Table 6: Independent-Samples t-test Comparing QoL domains with Anxiety and Depression.

QoL domains	Anxiety		Independent-Samples t-test	
	Normal	Abnormal	t	Sig. (2-tailed)
	Mean	Mean		
Physical domain	55.70	57.78	- .622	0.53
psychological domain	61.83	48.7	5.67	0.000*

QoL domains	Anxiety		Independent-Samples t-test	
	Normal	Abnormal	t	Sig. (2-tailed)
	Mean	Mean		
social domain	70.36	61.96	2.67	0.009*
environmental domain	58.44	53.65	1.51	0.132
Depression				
Physical domain	57.31	50.31	1.83	0.069
psychological domain	62.13	44.58	7.72	0.000*
social domain	70.43	59.84	3.17	0.002*
environmental domain	58.40	52.84	1.64	0.103

DISCUSSION

This study highlights the multidimensional impact of Dilated Cardiomyopathy (DCM) on patients' health-related quality of life (QoL), with particular emphasis on physical, psychological, social, and environmental domains. The findings reveal that the physical domain scores are the lowest among the four, reflecting significant limitations in daily activities, mobility, sleep quality, and work capacity. This is consistent with previous research indicating that physical health is markedly affected in DCM patients (Kaprana, 2009; Seid, 2020; Steptoe *et al.*, 2000). The environmental domain also scored low, likely influenced by socio-economic challenges unique to Sudan, such as limited healthcare access and financial constraints, which cultural factors may exacerbate (Skevington *et al.*, 2004). Conversely, the social domain scored relatively high, suggesting that strong familial and social support systems in Sudan may buffer some adverse effects, aligning with observations that extended families often provide substantial social backing in similar cultural contexts (Kaprana, 2009).

Sociodemographic factors also significantly influence QoL; younger patients, males, employed individuals, and those with sufficient income reported better quality of life, especially in physical and psychological aspects (Comín-Colet *et al.*, 2016; Kaprana, 2009). These associations reinforce findings from global studies, including those by Steptoe (Kaprana, 2009) and Colet (Comín-Colet *et al.*, 2016), indicating that age, gender, employment, and income are critical determinants of perceived well-being in chronic illness. Notably, the severity of heart failure, measured by NYHA class and LVEF, correlated strongly with physical and psychological QoL, with worse functional class and lower ejection fractions leading to poorer outcomes (Comín-Colet *et al.*, 2016). This supports the notion that disease progression directly diminishes quality of life.

When exploring psychological health, mental health issues such as anxiety and depression were prevalent, affecting approximately 20% of the cohort. Patients with abnormal anxiety and depression levels perceived significantly lower social and psychological well-being, echoing findings in similar populations (Comín-Colet *et al.*, 2016; Kaprana, 2009; Steptoe *et al.*,

2000). The significant associations between mental health and QoL underscore the critical need for integrated psychological support in managing DCM patients, as addressed in prior literature (Comín-Colet *et al.*, 2016; Kaprana, 2009). Overall, our results emphasize that both clinical severity and sociodemographic factors contribute to QoL, and addressing mental health and socioeconomic barriers is essential for comprehensive care in this population (Comín-Colet *et al.*, 2016; Kaprana, 2009).

CONCLUSION

This study highlights how DCM negatively impacts patients' quality of life across multiple domains, with disease severity and sociodemographic factors playing a significant role. Improving physical, psychological, and social well-being requires a comprehensive approach that includes medical, mental health, and socioeconomic support to enhance patient outcomes.

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