



Quality of Life for Patients Using Ventricular Assist Devices: A multi-modality Study

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Abstract

Introduction: So far, there is no sufficient literature that examined the impact of using Ventricular Assisting Devices (LVAD) among patients and the impact on the patients' quality of life (QoL) and the adaptation. This study aimed to assess the QoL in patients with LVAD and to explore the lived experience of patients with LVAD.

Methods: A mixed method study included 24 patients who had an LVAD implanted. The Minnesota Living with Heart Failure Questionnaire was used to collect data. Interviews were used to gather qualitative data. T-tests, correlations, and ANOVA were utilized as statistical tests.

Results: The study found a significant difference, in the physical dimension, ($p = 0.03$), emotional quality of the lived dimension ($P = 0.02$). Six sub-points including: 1) physical suffering and frequent hospitalization, 2) limited physical movement and quality of life, 3) negative psychosocial and emotional experiences, 4) adaptation to new challenges, 5) restoration of movement, independence, and quality of life, and 6) a support system.

Conclusion: The QoL of patients who have an implanted LVAD improves. After LVAD implantation, both physical and mental aspects influence QoL.

KeyWords: Quality of Life, Heart Failure, Left Ventricular Assist Device.

DOI Number: 10.14704/nq.2022.20.11.NQ66335

NeuroQuantology 2022; 20(11): 3255-3273

Introduction

The prevalence of Heart Failure (HF) is estimated to continue to increase as the population ages. The prevalence of HF in the United States alone will rise to over 8 million patients by the year 2030, representing a 25 percent increase compared to 2010 (Savarese, & Lund, 2017). Initially, people can treat their HF with changes in lifestyle and medicine, but more intensive treatment is required to thrive when their health condition worsens (Lainscak, Spoletini, Coats, & 2017).

A growing burden of coronary heart disease (CHDs) in Lebanon. If successful prevention approaches are implemented, this development can be mitigated (Abed et al., 2018; Zeidan et al., 2016). The mortality rate is 231,65 per 100,000 people, placing Lebanon in the top 50 countries for congestive heart failure-related mortality (Isma'eel et al., 2018).

Patients with advanced HF have a poor prognosis, with a life expectancy of less than two years (Birati, & Jessup, 2015). Healthcare professionals identify the stage and functional class of HF to choose the most appropriate treatment for patients. From Class I (no dyspnea or severe weariness from routine physical activity) to Class IV (dyspnea at rest

or with very little effort), the classification system describes the degree of functional impairment. By clinically recognizing patients across the heart failure spectrum and linking them to the proper medical therapy at each stage of the disease, these stages complement the New York Heart Association's (NYHA) definition of heart failure (Yancy et al., 2013).

A person with HF typically requires ongoing inotropic treatment, mechanical circulatory assistance, or hospice (Yancy, 2013). In advanced cases, cardiac transplantation is the ideal treatment, but the number of transplants conducted globally is insignificant. Mechanical circulatory support (MCS) devices have emerged as an essential therapy for developed HF such as LVADs (Left Ventricular Assist Device) (Kirklin et al., 2017).

A ventricular assist device (LVAD) is a pump that helps a failing heart and is powered by a drivetrain. Almost 50% of LVAD patients continue with the LVAD for more years (Kirklin et al., 2017). Furthermore, the survivors experience a functional and quality of life (QoL) during the first year following the procedure (Abshire et al., 2016). LVAD therapy has been shown to prolong patients' lives and improve their QoL (Kato et al., 2015). LVAD implantations are likely to continue to



develop with increasing organ heart shortage and global population aging(Kirklin et al., 2017).However, a high level of patient self-care and a multidisciplinary team's holistic management are necessary for long-term LVAD treatment to be successful.

Physical, mental, and social functioning are all parts of the multidimensional concept of QoL.Through the use of rating scales or health status questionnaires, QoL can be evaluated indirectly.Unique characteristics of having an LVAD have been identified by qualitative studies as potentially stressful, including changes in body image, energy and device management, bathing and swimming restrictions, driving restrictions, and affection-related ramifications(Marcuccilli, &Casida, 2012).

Although the literature has analyzed functional status and patient-reported outcomes, including QoL, no study has examined the effect of LVAD implantation on the Lebanon patients' QoL to yet, giving a comprehensive account of how these patients experience and adjust to living with an LVAD. Have a life depend on using a ventricular assist device could be associated with psychosocial issues related to the consensual acceptance process.The studies that merged LVAD effectiveness evaluation in terms of increased hemodynamics, longevity, and risks, with patient experience appraisal of improvements in QoL, focused primarily on physical functionality(Imamura et al., 2018; Jung et al., 2016). Discrepancies in the understanding of well-being between doctors and patients have long been recognized: practitioners generally focus on the disease's physical manifestation, while patients regard resilience, deficiencies of function, emotional problems, and mental health as essential determinants of the ultimate burden of disease. It has been shown that qualitative approaches for measuring QoL yield details

that would be lost using only quantitative questionnaires(Wulfovich, Buur, &Wac, 2022). This study aimed to assess the QoLin patients with LVAD, as well as exploring their experiences with used these devices and the impact of their lifestyle.

Materials and Methods

Design

A mixed-methods study was carried out. A quantitative technique using a descriptive design was combined with a qualitative approach using the focus-group method to investigate patients' experiences.

Setting

This study was conducted in the critical care units of Cardiac Institute, at Hospitalin Lebanon.

Population and Sampling

A convenient sample was used, patients who had implanted LVAD (24 patients) were recruited in this study with the following:Patients were excluded for transplant or death before 365 days of mechanical circulatory support.

Quantitative data collection

Data was collected using two questionnaires, including the Minnesota Living with Heart Failure Questionnaire (MLHFQ), to examine how patients coped with their condition.

This survey covers 21 significant physicals, emotional, and socioeconomic ways that HF can negatively impact a patient's life. The patient marks a 0 (zero) to 5 scale after receiving brief, standardized instructions to indicate how much each HF-related factor has interfered with the patient's ability to live as they have desired over the previous four weeks. The 21 responses to the questionnaire are simply added up to determine the score. In investigations and evaluations of outpatients with symptomatic (NYHA classes II to IV) HF with a decreased or preserved ejection fraction, the instrument can be employed as a major outcome measure. This



patient-reported outcome can be used to assess how well an HF treatment improves patients' QoL by lessening the negative effects of HF. Scores vary from 0 to 105, with a score of less than 24 signifying a good QoL, 24 to 45 signifying a middling QoL, and more than 45 signifying a poor QoL. It has been reported that the MLHFQ has been used with LVAD patients (Bien et al., 2020; Pagani et al., 2009). Its validity and repeatability have also been observed (Rector, & Cohn, 1992; Rector, Kubo, & Cohn, 1993).

Qualitative data and focus group discussion

After having filled out the questionnaires, the participants were invited to participate in focus group discussions and interviews that gathered data about their perceptions of LVAD and how it affected their lifestyle and their QoL. Ten patients have responded to the invitation and have voluntarily agreed to take part in the group discussions. The focus group interviews were conducted a week after the patients completed the questionnaires, where the discussion took a semi-structured format. The researcher met with the participants in two groups at a seminar room in the respective clinical setting after have agreed with them on the date and timing, thus convenience of the meeting session was taken into consideration. The participants have been socialized to break the ice of the group dynamic. After that, the researcher has introduced the research and explained the aim of the session. The participants were reassured that this discussion is completely anonymous and that any verbatim published would not identify them by name but rather data will be coded for confidentiality. The patients were also informed that they can pull out of the study at any time they feel the need to. The focus group audiotaped and transcribed, however to avoid any inhibitions that might be imposed by the tape recorded, the participants were assured that no one would have access to the recorded material but the researcher and it will be securely

stored. The focus group discussion mainly extended over the period of 2 hours in order to extract saturated data. Data from the focus group interview was aggregated and a thematic analysis was undertaken. In order to collect the data, the patients were asked the following open-ended questions:

- a. How do you describe your QoL before LVAD implantation?
- b. How did LVAD implantation affect your QoL?

Trustworthiness of the study

In order to avoid any biases that might affect the qualitative results of this study, multiple measures were adopted. First, concurrent analysis was carried out in order to make sure that the themes that have emerged from the thematic analysis are relevant and true to the essence of the data, thus reflecting a genuine understanding of the patients' experiences. All the participants have been convened with in the same setting, around the same time of day, and have been treated in the same professional and amicable manner by the researchers. In addition, the questions that have been asked were exactly the same, and the authors have discussed all the emerging themes and have not omitted any piece of information that has resulted from the focus group discussions. Direct literal citations were used to support the study findings. The data analysis was implemented independently by two researchers.

Procedure

Official permission to conduct this study was obtained from the responsible authority and referred to the institutional review board (IRB). Consent forms were obtained from the LVADs patients after an explanation of the aim of the study. A pilot study was conducted on five patients to test the applicability of the studied tool and any required modifications were done. The data was collected from



patients with LVAD using MLHFQ. Then patients were interviewed individually when available during their routine check-ups. The researcher was available to clarify information during the 20 to 30 minutes when completing the survey.

Translation and back-translation of the tools was done from English into Arabic by a professional English language editor. Then the two forms, compared. The translated Arabic version will be examined by three experts in the field.

In order to collect the qualitative data, we used semi-structured interviews. The recordings are taken after the consent of the participants. The duration of each interview was 20 minutes. After the transcription of the interviews, the analysis of the collected data began with an axial coding of the transcripts. Each transcribed answer has been classified in a category representing the idea it conveys. These categories were then grouped into more general themes and sometimes broken down into more detailed subcategories according to the particularity of the idea put forward. Sometimes selective coding is used (the recurrence number of each idea). This thematic analysis of the content was carried out for the various interviews conducted in order to identify the commonalities that contradict, complement and reinforce each other. The objectivity of the categories is assured, since the chosen categories are based on a theory.

Data analysis

IBM SPSS, Version 25.0, was used to analyze quantitative data (Armonk, NY, USA: IBM Corp). Sample socio-demographic characteristics were described using descriptive statistics. Descriptive analysis was carried out after grouping the items of the MLHFQ into the three respective dimensions; the physical, emotional and social dimensions of QoL. An independent t-test used to find any

difference on scores for the quality of living with HF according to gender and working status. An ANOVA test was carried out to determine the difference in the quality of living with HF according to age, marital status, medical condition, and stages of HF. A Person's correlation was carried out to determine if there is a relationship between the medical characteristics of the participants and the quality of living with HF. A bivariate correlation was carried out to determine if there is a relationship between the sociodemographic characteristics of the patients and the quality of living with HF. $P < 0.05$ was used as the significant level. The qualitative data was organized and coded using NVivo. The audio clips were made in Arabic, and then the audio recordings were transcribed verbatim in Arabic and translated into English.

Results

Socio-demographic Characteristics

Twenty-four patients who have undergone LVAD implantation have met the eligibility criteria and have participated in this study, where 18 (75%) were males while six (25%) females. The ages of the participants mainly between 40 and 50 years (45.8%), 3 patients aged between 20 and 30 years (12.5%), and another 3 aged between 30 and 40 years (12.5%), 6 patients aged between 50 and 60 years (25%) while only one patient aged over 60 years. The results indicate that 11 (45.8%) of the participants have attained high school, while 10 (41.7%) attained middle school and only three (12.5%) attained university level education. In addition, 20 (80.3%) of the participants were married, 23 (95.8%) of them were non-smokers and 20 (80.3%) of them were workers. The descriptive statistics also evaluated the medical condition and the stage of the heart failure that the patients were diagnosed with. The findings indicate that 16 (66.7%) had hypertension and 16 (66.7%)



were diagnosed with Stage III heart failure prior to the implantation of the LVAD. The duration of heart failure before LVAD implantation was assessed and the results show that the mean duration was $M= 3.41$ years ($SD=1.88$) (Table 1).

Quality of Living with Heart Failure after LVAD Implantation

The patients who took part in this study answered to the Minnesota Living with Heart Failure Questionnaire, which comprised of 21 questions revolving around the various aspects of QoL while dealing with HF after LVAD implantation. The descriptive analysis showed that the participating reported less symptoms and negative impact and thus a higher QoL with HF scores after implantation of LVAD. The detailed responses of the participating patients are delineated in table-2.

The results showed that the highest-ranking dimension was the social where it recorded a mean score of 1.50 ($SD= 0.48$), followed by the emotional dimension with a mean score of 1.42 ($SD= 0.54$), and the last is the physical dimension of QoL where it recorded a mean score 1.14 ($SD= 0.43$).

The difference in quality of living with heart failure according to patients' characteristics

The results showed no significant difference in the level of the physical ($P=0.10$), emotional ($P= 0.31$), or social dimensions ($P=0.82$) according to gender (Table 3). The study found significant differences on living dimensions for both physical ($P=0.03$) and emotional quality ($P= 0.02$). However, no significant differences were noted on the level of the social dimension ($P=0.10$).

Furthermore, ANOVA test was carried out to determine the differences in the QoL with HF according to age, marital status, the medical

condition, and the stage of HF. The results found that no significant difference on the level of the physical ($P=0.66$), emotional ($P= 0.32$), or the social dimension ($P=0.44$) according to age (Table 4). In addition, there was no significant difference on the level of the physical ($P=0.61$), emotional ($P= 0.30$), or the social dimension ($P=0.87$) according to marital status (Table 5). Moreover, the results indicated no significant difference on the level of the physical ($P=0.54$), emotional ($P= 0.17$), or the social dimension ($P=0.97$) according to the medical condition and no significant difference on physical level ($P=0.34$), emotional ($P= 0.31$), or the social dimension ($P=0.15$) according to the stage of HF (Table 4).

Relationship between quality of living with heart failure and patient characteristics

The results of the study showed that there is a highly significant and positive correlation between the stage of heart failure and the social quality of life where a p-value of $P=0.05$ was recorded. A highly significant correlation was also noted between the existing medical condition and the emotional dimension of the quality of life where a p-value of $P=0.03$. In addition, highly significant correlation was noted between the duration of heart failure before LVAD implantation and the physical dimension of quality of life, ($P=0.04$) and social dimension with a p-value of $P=0.02$. In contrast, the results showed no significant correlations on the level of any dimension (Table 5).

Phenomenological Data Analysis

Six patients agreed to participate in this approach of the study. Findings from the focus group resulted in the following 2 major themes (Suffering Pre-LVAD Implantation and Healing Post-LVAD Implantation) and 4 subthemes: (1) Physical Suffer and additions to Hospital, (2) Limit Physical Mobility and limit



Quality of Life, (3) experience a Negative psychosocial and emotional situation, (4) Adapt to new challenges (5) Reclaim Independency and Quality of Life, as well as able of Mobility, (6) have a Support System (Table 6).

Discussion

The results of this study showed that the overall QoL improved after LVAD implantation. This is consistent with a study carried out by Bidwell et al. which investigated the effect of LVAD implantation on the QoL of patients with HF. The study found a significant enhancement in the overall QoL of the patients post LVAD implantation. Significant improvement a month after transplantation, and improvements were also made in the following months (Bidwell et al., 2017). Our findings are also consistent with other previous studies that have examined the QoL of patients with LVAD implantation and have revealed maintained enhancement in the overall QoL and functional capacity (Jakovljevic et al., 2014; Kato et al., 2015; Modica et al., 2015).

To address the domains of the QoL specifically, the elements of the questionnaire were summed into three subscales; the social, emotional, and physical QoL. The results of this study found that patients with LVAD reported improvement on the level of the three domains where they reported less physical symptoms, enhanced social and emotional experiences. These results are consistent with Fendler et al. findings, which suggest that LVAD has been proven to improve the physical functioning of patients previously suffering from HF (Fendler et al., 2017). In addition, Sandau et al., argued that LVAD implantation improved physical QoL and reduced somatic symptoms such as fatigue, shortness of breath and edema. Past studies have delineated that physical well-being is positively affected by the LVAD among patients who have been suffering from

HF (Jakovljevic et al., 2014; Modica et al., 2015; Merle et al., 2015; Emin et al., 2016). On the other hand, other studies have suggested that in spite of the physical amelioration, some patients still complain of certain functional limitations, including vigorous exercise and certain activities (Abshire et al., 2016; Jakovljevic et al., 2014; Fendler et al., 2017), which is consistent with the findings in the qualitative aspect of the paper which will be mentioned later on in the discussion. However, inconsistent with our results, Kitko et al., have indicated that LVAD implantation has implicated a lot of complications and increases hospitalization for some patients (Kitko et al., 2016).

As for the emotional and social domains of QoL, the results of this study showed that the patients who had undergone an LVAD implantation reported improved emotional and social experiences. The findings in this study were consistent with a study by Sandau et al. and Casida et al., where they found that the patients reported feeling of regaining meaning of life due to increased functionality and productivity after LVAD implantation. The study results are also in line with that of Kitko et al., and Casida et al., where they found that the patients experienced a sense of gratefulness and happiness after LVAD implantation. The results showed that the most affected QoL domain was the social domain, and that was consistent with previous literature. According to the studies stated, having an LVAD might cause patients to feel in a state of limbo where they are severely in need of a heart transplant but are placed lower on the priority list because of the device's ability to stabilize their medical condition. Since patients are frequently still reliant on caretakers and are always reliant on the LVAD device and the LVAD interdisciplinary team, acceptance of an LVAD and emotional adaption take time, can impose role adjustments for the patient, and can impair their social/interpersonal connections. This dependence can cause



anger or pessimism because it may be regarded as a lack of control over one's life. Merle et al. also talked about sexual fulfillment while using an LVAD. Patients stated that fear of partner disappointment, abrupt cardiac arrest, self-harm, or LVAD failure were the top causes of reduced sexual engagement following implantation (Merle et al., 2015).

The results of this study showed that there was no difference in the reported QoL among the participants according to gender, age and other patient characteristics. This was inconsistent with the findings of Grady et al., which indicated that younger patients and women reported lower QoL and more problems post-LVAD implantation (Grady et al., 2015). However, a study by Shumway (2004) showed that gender did not affect post-LVAD outcomes and survival rates, thus our results come consistently with such findings (Shumway, 2004).

The qualitative results of the study were consistent with that of Marcuccilli & Casida (2012) who indicated that patients identified an arduous experience before LVAD implantation and progress post-implantation, where themes similar to ours were identified (Marcuccilli, & Casida, 2012). The first theme Marcuccilli mentioned was titled "life begins to change with HF" which includes five subthemes namely 1) breath shortness; 2) deep limitations; 3) at-death's-door; 4) wishing to live through using LVAD; and 5) resolve to live. 1) These results were also in line with those of Sandau et al., 2014 and Ottenberg et al., 2014 which also highlighted in their findings the experiences of the HF patients prior to LVAD implantation as arduous and full of challenges leading to low QoL.

Moreover, another theme was also identified by Marcuccilli's study and was titled "Adjustments and acceptance come with

time" (Marcuccilli, & Casida, 2012). This theme involved a subtheme "Improved q QoL" which is very much in line with our results where our study indicated "Reclaimed Mobility, Independence and QoL" as a subtheme in the post-LVAD implantation phase. In Marcuccilli's study (Marcuccilli, & Casida, 2012), The patients indicated that their overall QoL improved after LVAD implantation. These results are also consistent with those of Ottenberg et al. 2014 and Sandau et al. 2014 who highlighted that "Problem focused coping" made the patients feel more independent and taking control of their own life (Sandau et al., 2014). This could use a coping strategies that involve assessment and learning in-depth about the problem, learning new skills to deal with the problem, as well adapting their lives to the situation. Watchful monitoring can be interpreted as a coping strategy, i.e. problem-focused coping, in which caregivers have adapted their lives of their loved ones (Palmen et al., 2016).

Therefore, our results are in the broad sense and somehow particularly consistent with the existing literature regarding that LVAD improves the overall QoL of patients with HF and enhances their experiences in spite of certain challenges that accompany this treatment modality.

Limitations

Small sample size was a limitation, however the number of patients with LVAD and were accessible to this study was limited.

Conclusion

HF patients have experienced an improved QoL after LVAD implantation on the levels of physical, social, and mental domains of QoL, despite of the day-to-day challenges that this management modality poses and the life style that it demands.

Implications

The findings of this study added to the knowledge of the experiences of LVAD among



patients and caregivers. Results from this study have theoretical and academic implications. It helps to address the lack of literature that needs study into wellness habits and the QoL aspects of people residing with an LVAD. also, it can be used to support nurses and other health practitioners of care recognize this population's innovative strategies and expectations and issues. The findings can support a holistic approach to the delivery of hospice and end-of-life care to enhance well-being, quality of life, and dignified death.

Recommendations

Larger sample sizes, multiple geographic areas and demographics, also designs of interventional experiments may be considered for future research. Conceptual frameworks can be used to analyze the bio-psycho-social-spiritual factors that determine the experiences and willingness of patients to cope with and respond to LVAD.

Conflict of Interests: The authors declare that there are no conflicts of interests.

Research Funding: None.

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Table 1. Sociodemographic data				
			N	%
Gender	Male		18	75
	Female		6	25
Age	20-30		3	12.5
	30-40		3	12.5
	40-50		11	45.8
	50-60		6	25
	More than 60		1	4.2
Educational Level	School		10	41.7
	High school		11	45.8
	University		3	12.5
Marital Status	Single		3	12.5
	Married		20	80.3
	Divorced		1	4.2
	Widowed		0	0
Smoking	Yes		1	4.2
	No		23	95.8
Work Status	Yes		20	83.3
	No		4	16.7
Medical Condition	Hypertension		16	66.7
	Diabetes		1	4.2
	Depression		3	12.5



Stage of Heart Failure	Stage I	0	0
	Stage II	0	0
	Stage III	3	12.5
	Stage IV	21	87.5

	No	Very little	A little	Frequently	More Frequently	Very Much
Causing swelling in your ankles or legs?	1 (4.2%)	16 (66.7%)	7 (29.2%)	0	0	0 0
Making you sit or lie down to rest during the day?	0	15 (62.5%)	7 (29.2%)	2 (8.3%)	0	0 0
Making your walking about or climbing stairs difficult?	1 (4.2%)	12 (50%)	9 (37.5%)	2 (8.3%)	0	0
Making your working around the house or yard difficult?	1 (4.2%)	13 (54.2%)	8 (33.3%)	2 (8.3%)	0	0 0
Making your going places away from home difficult?	1 (4.2%)	12 (50%)	10 (41.7%)	1 (4.2%)	0	0 0
Making your sleeping well at night difficult?	1 (4.2%)	10 (41.7%)	11 (45.8%)	2 (8.3%)	0	0 0
Making your relating to or doing things with your friends or family difficult?	0	13 (54.2%)	8 (33.3%)	3 (12.5%)	0	0 0
Making your working to earn a living difficult?	2 (8.3%)	14 (58.3%)	7 (29.2%)	1 (4.2%)	0	0 0
Making your recreational pastimes, sports or hobbies difficult?	1 (4.2%)	9 (37.5%)	14 (58.3%)	0	0	0 0
Making your sexual activities difficult?	0	4 (16.7%)	12 (50%)	6 (25%)	1 (4.2%)	1 (4.2%)
Making you eat less of the foods you like?	7 (29.2%)	10 (41.7%)	6 (25%)	1 (4.2%)	0	0
Making you short of	1	13 (54.2%)	6	4	0	0



breath?	(4.2%)		(25%)	(16.7%)			
Making you tired, fatigued, or low on energy?	2 (8.3%)	10 (41.7%)	10 (41.7%)	2 (8.3%)	0	0	0
Making you stay in a hospital?	7 (29.2%)	9 (37.5%)	7 (29.2%)	1 (4.2%)	0		0
Costing you money for medical care?	0	11 (45.8%)	12 (50%)	1 (4.2%)	0		0
Giving you side effects from treatments?	0	19 (79.2%)	5 (20.8%)	0	0	0	0
Making you feel you are a burden to your family or friends?	1 (4.2%)	15 (62.5%)	8 (33.3%)	0	0	0	0
Making you feel a loss of self-control in your life?	0	12 (50%)	11 (45.8%)	1 (4.2%)	0		0
Making you worry?	1 (4.2%)	10 (41.7%)	12 (50%)	1 (4.2%)	0		0
Making it difficult for you to concentrate or remember things?	5 (20.8%)	15 (62.5%)	4 (16.7%)	0	0		0
Making you feel depressed?	3 (12.5%)	9 (37.5%)	6 (25%)	3 (12.5%)	3 (12.5%)		0

Table 3. The difference in the quality of living with heart failure according to gender and work status

			P-value	t	Mean	SD
PHYSICAL	Gender	Male	0.10	-1.55	1.07	0.34
		Female		-1.16	1.37	0.61
	Working status	Working	0.03	1.33	1.19	0.45
		Not Working		2.76	0.88	0.09
EMOTIONAL	Gender	Male	0.31	-1.34	1.33	0.49
		Female		-1.15	1.66	0.65
	Working status	Working	0.02	1.31	1.48	0.56
		Not Working		2.36	1.10	0.20



SOCIAL	Gender	Male	0.82	-0.98	1.44	0.45
		Female		-0.88	1.66	0.56
	Working status	Working	0.10	1.36	1.55	0.49
		Not Working		2.29	1.20	0.20

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Table 4. The differences in the quality of living with heart failure according to age, marital status, the medical condition, and the stage of HF.

		According to age				According to marital status				According to the medical condition				According to the stage of HF			
		df	M	F	p-value	df	M	F	p-value	df	M	F	p-value	df	M	F	p-value
PHYSICAL	Between Groups	2	0.08	0.42	0.66	2	0.09	0.50	0.61	3	0.14	0.74	0.54	2	0.20	1.15	0.34
	Within Groups	21	0.19			21	0.19			20	0.19			21	0.18		
	Total	23				23				23				23			
EMOTIONAL	Between Groups	2	0.33	1.18	0.32	2	0.35	1.27	0.30	3	0.48	1.84	0.17	2	0.35	1.24	0.31
	Within Groups	21	0.28			21	0.28			20	0.26			21	0.28		
	Total	23				23				23				23			
SOCIAL	Between Groups	2	0.20	0.86	0.44	2	0.03	0.13	0.87	3	0.02	0.08	0.97	2	0.44	2.11	0.15
	Within Groups	21	0.23			21	0.24			20	0.26				0.21		
	Total	23															

Table 5 . Relationship between medical characteristics and patient characteristics and quality of living with HF

		PHYSICAL	EMOTIONAL	SOCIAL
Stage of Heart failure	R-value	0.28	0.30	0.39
	P-value	0.17	0.15	0.05
	N	24	24	24
Medical Condition	R-value	-0.30	-0.43	-0.10
	P-value	0.14	0.03	0.61
	N	24	24	24
Duration of Heart Failure before LVAD	R-value	0.42	0.19	0.47
	P-value	0.04	0.35	0.02
	N	24	24	24
Gender	R-value	0.31	0.28	0.21
	P-value	0.14	0.19	0.34
	N	24	24	24
Age	R-value	0.15	0.16	0.12
	P-value	0.50	0.47	0.59
	N	24	24	24
Educational Level	R-value	-0.13	-0.29	-0.15
	P-value	0.54	0.17	0.47
	N	24	24	24
Marital Status	R-value	0.21	0.32	0.11
	P-value	0.32	0.12	0.61
	N	24	24	24
Smoking	R-value	-0.07	-0.09	-0.15
	P-value	0.74	0.69	0.49
	N	24	24	24
Working	R-value	-0.27	-0.27	-0.28
	P-value	0.20	0.20	0.19
	N	24	24	24

Table 6. Overview of themes, sub-themes and supporting quotations

Themes	Sub-themes	Supporting quotation
Suffering Pre-LVAD Implantation	Physical Suffering and Frequent Hospitalization	<i>“I could not walk from my bed to the door. It was like I was paralyzed or deranged, trapped in my own body”.</i> <i>“It was like I was drowning in my own body, full of</i>



		<p>fluids. If I lie on my back I would start suffocating, if I walk around I start fighting for my breath. It is literal suffering.”</p> <p>“It is like you have no energy whatever, always fatigued. I can’t talk a lot because I am busy catching a breath, I can’t even go to the bathroom by myself without stopping midway for a break because I am out of energy, let alone how my feet are swollen and won’t help me to move freely”.</p>
	<p>Limited Physical Mobility and Quality of Life</p>	<p>“Worrying about physical limitations makes your life less and less significant. I couldn’t enjoy quality time with my family without having to deal with the symptoms”.</p> <p>“Before the implantation, my life was ruined physically, emotionally, and socially. I couldn’t do any exercise, I felt like I was a burden all the time, and the times were I could’ve tried to improve my mood and change routine, I couldn’t as I was not able to leave my home and sometimes my bed”.</p> <p>“ I want to enjoy my life, my family, my friends, my activities, but all that happened before the implant was getting weaker and weaker and giving up on a lot of activities”.</p>
	<p>Negative psychosocial and emotional experiences</p>	<p>“I was terrified, literally terrified especially every time I relapse and get admitted to the hospital. Every time I think this is maybe the last time I will get out of the hospital”.</p> <p>“Sometimes I would totally get confused, don’t know what I am reasoning about, I forget things because I am preoccupied with worrying about my case”.</p>
<p>Healing Post-LVAD Implantation</p>	<p>Adapting to new challenges</p>	<p>“The first month of the recovery was very hard for me. I almost could not tolerate the pain”.</p> <p>“The pain does not magically disappear. It takes time and patience”.</p> <p>“Pain, recovery, displacement, family problems. I stayed for a long time in bed. But once that is done with you know your life is about to start”.</p>
	<p>Reclaimed Mobility, Independence and Quality of Life and</p>	<p>“Since the LVAD implantation I have been feeling less vulnerable and impotent. I can walk around feeling more comfortable and definitely less fatigued than</p>



		<p>before”.</p> <p>“I have more control over my body, over my breath. I can walk to places I wasn’t able to get to before. I was physically out of shape but now I feel more competent and I can actually achieve a physical effort”.</p> <p>“I have a better quality of life since the implant, I have higher stamina, I am no longer trying to catch my breath all the time whenever I need to run an errand”.</p>
	Support System	<p>“One of the main reasons I am still going is my family. They had a major role in my recovery”.</p> <p>“Having my family members encouraging me during my bed rest period was the most important thing to me as the recovery process isn’t that easy. My support systems were my family and my friends and they were pushing me to be patient and persevere. Look at me now.”</p>

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