

Hope, Mood States and Quality of Life in Female Heart Transplant Recipients

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Objective: The role of hope on mood states and quality of life (QOL) in heart transplant recipients has not been examined previously. This exploratory study was done to describe levels of hope, mood states and QOL; examine relationships between these variables and demographic characteristics; and identify predictors of QOL in female heart transplant recipients.

Methods: Fifty women from a single heart transplant clinic were asked to complete the Herth Hope Index (HHI), Multiple Affect Adjective Checklist (MAACL) and SF-12 (which produces a physical component summary [PCS] and a mental component summary [MCS]). Descriptive statistics, Pearson correlations, and stepwise multiple regression were used to analyze the data. The level of statistical significance was set at 0.05.

Results: Patients on average were 54.7 ± 13.0 years of age and had undergone heart transplantation 5.2 ± 4.4 years prior to study participation. Patients reported experiencing moderately low hope, and moderately high anxiety, depression and hostility. They also exhibited low levels of QOL as reflected in their low PCS and MCS scores. There was a strong positive association between hope, mood states and MCS ($p = 0.001$). In a multiple regression model, age, hope and depression accounted for 69% of the variance in the MCS.

Conclusions: The study supports the strong association between hope, mood states and the MCS of QOL in female heart transplant recipients. Hope was an independent predictor of mood states and QOL. This finding suggests that interventions directed at fostering hope among heart transplant recipients may be the key to improving their QOL. *J Heart Lung Transplant* 2003;22:681–686.

Individuals who undergo heart transplantation may progress from a terminal state of heart failure

to a comparatively active lifestyle. However, heart transplantation is a major surgical intervention that

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results in increased distress and anxiety,¹⁻⁴ and a number of patients find themselves confronted with the difficult and unexpected task of adapting to a chronic physical condition after the surgery.⁵ For this reason, care of the heart transplant patient has evolved from focusing solely on survival to improving emotional well-being and quality of life (QOL).

Despite the growing body of research that supports improvements in QOL after heart transplantation,⁶⁻⁹ QOL studies that focus more on mood disorders and psychologic states (depression, anxiety and hostility) rather than on the functional abilities of patients are limited. There is also a limited amount of research focusing on the role of hope or positive expectations on psychologic adjustment and QOL among heart transplant recipients; studies among heart transplant candidates, however, have shown that more effective psychosocial adaptation is associated with hope.^{10,11} Finally, the majority of studies on QOL after heart transplantation have included an insufficient number of women to allow for a generalization of results to female heart transplant recipients.² Considering the fact that female gender is an independent risk factor for increased prevalence and risk of depression and anxiety-related disorders after heart transplant,⁴ additional research that examines mood states and QOL in female recipients is needed to better understand psychosocial problems in this high-risk population.

The current investigation was conducted to develop a better understanding of hope and QOL after heart transplantation in female recipients. Specifically the study aims to: (1) describe hope, mood states and QOL; (2) examine the relationship between sociodemographic characteristics, hope, mood states and QOL; and (3) identify predictors of QOL in female heart transplant recipients.

METHODS

Setting and Participants

The setting for the study was a single outpatient post-transplant clinic associated with a tertiary university-affiliated medical center. A total of 50 women were enrolled between November and December 2000 upon approval of the study by the appropriate institutional review board. The inclusion criteria for study enrollment were: being female; post-heart transplant status; orientation to time, place and person; ability to read, write and speak English; and willingness to participate in the study.

Data Collection Procedures

Once informed consent was obtained, the participants were asked to complete the study instruments. This was usually done before or after a follow-up clinic visit with their cardiologist. Questionnaire completion took between 15 and 20 minutes. Sociodemographic and clinical data (i.e., time since transplant, left ventricular ejection fraction) were obtained from the patient's medical record and from the patient. Fifty women consented to participate in the study and all 50 completed questionnaires, for an overall response rate of 100%.

Study Instruments

The Herth Hope Index (HHI), a 12-item (1- to 4-point) Likert-type scale was used to assess levels of hope. Summation scores ranged from 12 to 48, with a higher score denoting greater hope. A Cronbach α coefficient of 0.97 and a 2-week test-retest reliability have been previously reported.¹² The Cronbach α coefficient for the current study was 0.89.

The Multiple Affect Adjective Checklist (MAACL) was used to measure 3 mood states: anxiety; depression; and hostility. It is composed of 132 alphabetically arranged adjectives; plus items are scored if the participant checks them, and minus items are scored if the participant does not check them. This method of scoring provides partial control over the response set.¹³ Scores for anxiety, depression and hostility range from 0 to 21 (norm ≤ 7), 0 to 40 (norm 11) and 0 to 28 (norm 7), respectively. Higher scores reflect higher levels of dysphoria. The reliability and validity of the MAACL has been demonstrated in heart failure patients.¹³

QOL was measured using the SF-12, a 12-item, self-report, general survey for monitoring outcomes in patients with chronic conditions.^{14,15} The SF-12, like the original SF-36, produces 2 summary scales: a physical component summary (PCS), which reflects physical function levels, and a mental component summary (MCS), which reflects mental health levels. The PCS and the MCS of the SF-12 and the SF-36 have been shown to be highly correlated ($r > 0.90$) in several studies of patients with chronic illness.^{16,17} The SF-12 was selected for this study to ease respondent burden through the use of a shorter battery of questions while providing the same prognostic information as the longer form (SF-36).

Data Analysis

Data were analyzed using SPSS for Windows (version, 10.0, SPSS, Inc, Chicago, IL).¹⁸ Descriptive

statistics, including means, ranges and standard deviations, were used to describe levels of hope, mood states (anxiety, depression and hostility) and QOL (PCS and MCS). Prior to conducting uni- and multi-variate analyses, the data were screened for uni-variate outliers by examining the frequency distribution of all variables of interest. Uni-variate analysis (Pearson product moment correlations) was used to determine the relationships between socio-demographic characteristics, hope, mood states and QOL. To account for the multi-variate relation of the predictor variables (hope and mood states) to MCS (there were no observed associations between hope, mood states and PCS in the uni-variate analysis), a stepwise multiple regression was performed. Variables significant at $\alpha < 0.05$ in the uni-variate analysis were included in the regression model. To reflect the context variables, patient age was the first variable added to the model. Next, to depict the impact of psychologic adjustment on MCS of patients in the sample, hope, anxiety, depression and hostility were added as a second set. The significance level for the multiple regression model was also set at $\alpha < 0.05$.

RESULTS

Patient characteristics for the 50 participants studied are summarized in Table I. The mean age of the sample was 54.7 years (SD 13.0, range 18 to 78 years). The women had their heart transplant an average of 5.2 years prior to study (SD 4.4, range 0.4 to 22 years) with an average post-transplant ejection fraction of 52 (SD 7.5, range 40 to 65).

Table II lists the total mean scores for hope, mood states and QOL. The findings support that patients experienced only moderate levels of hope and moderately high levels of anxiety, depression and hostility. They also had moderately low scores on the PCS and the MCS, which is indicative of a moderately compromised QOL. The hope, mood states and QOL indicators were normally distributed.

Uni-variate analysis revealed that the only socio-demographic characteristic correlated with QOL was age; younger participants had higher (better) scores on both the PCS and MCS. Race, marital status, education, employment status and income as well as clinical characteristics, including years elapsed since heart transplant and ejection fraction, were not significantly related to any of the variables of interest in the study. The relationships between hope and each of the mood states were significantly negative (lower levels of perceived hope were asso-

TABLE I Demographic characteristics of post-transplant women ($N = 50$)

Characteristic	Mean \pm SD	N (%)
Age (years)	54.66 \pm 12.98	
Number of years since transplant	5.18 \pm 4.41	
Race (%)		
White		35 (70.0%)
Black		6 (12.0%)
Other		9 (18.0%)
Employment status (%)		
Employed		10 (20.0%)
Unemployed/retired		40 (80.0%)
Marital status (%)		
Married		26 (52.0%)
Not married		24 (48.0%)
Education		
\leq High school		24 (48.0%)
Vocational or junior college		15 (30.0%)
\geq College		11 (22.0%)
Annual income (\$)		
<15,000		23 (46.0%)
15,000–29,999		5 (10.0%)
30,000–49,999		8 (16.0%)
50,000–74,999		10 (20.0%)
\geq 75,000		4 (8.0%)

ciated with higher levels of anxiety, depression and hostility). Although a strong positive association was observed between hope and MCS, we did not observe any association between hope and PCS. Finally, we found that mood states were inversely related to MCS ($p < 0.05$) (see Table III).

The model of QOL outcomes described herein suggests that hope and mood states will predict individual differences in MCS, even when the context variable (patient's age) is taken into account.

TABLE II Total hope, mood states and quality of life scores ($N = 50$)

Characteristic	Mean	SD	Range
Hope (Herth Hope Index)	35.84	5.08	27–44
Mood states (MAACL)			
Anxiety	9.90	5.63	0–19
Depression	16.12	8.48	0–31
Hostility	11.16	5.13	0–19
Quality of life (SF-12)			
Physical component score	37.91	8.57	26–59
Mental component score	41.64	12.59	18–64

TABLE III Correlational matrix for the key variables ($N = 50$)

Variable	1	2	3	4	5	6	7
1. Age							
2. Marital status	0.293*						
3. Hope	-0.189	0.066					
4. Anxiety	-0.189	0.077	-0.555†				
5. Depression	-0.124	0.158	-0.783†	0.756†			
6. Hostility	0.005	0.060	-0.499†	0.570†	0.798†		
7. QOL-physical	-0.361†	0.127	-0.172	-0.225	-0.249	0.074	
8. QOL-mental	-0.295*	0.103	0.769†	-0.673†	-0.794†	-0.553†	0.261†

* $p < 0.05$; † $p < 0.001$.

The predictors of MCS in the current study were age, hope and depression (see Table IV). These 3 predictors accounted for 69% of the variance in the MCS scores of the sample. Post hoc analysis was done to test for multi-collinearity among variables and demonstrated that each of the predictors had unique effects on MCS.

DISCUSSION

Several important limitations must be considered when interpreting the results from our study. First, as expected with descriptive, correlational studies, causation cannot be inferred. We cannot say that lack of hope or high levels of mood disorders will result in poorer QOL. Our findings merely support an association between hope, mood states and mental health dimensions of QOL. The small sample size also limits generalization to all female heart transplant recipients. It should also be noted that data from the study were gathered from a population of primarily white individuals, and therefore our findings may not generalize to other ethnic groups. Furthermore, the cross-sectional design limits our ability to make inferences related to the variables of interest in relation to changes over time. Nevertheless, we do make several observations in our study that advances this field of inquiry.

Our findings support that female heart transplant recipients experience moderately low levels of hope. Prior to the heart transplant, patients generally experience anxiety and feelings of hopelessness

about their future,¹⁰ as well as loss of control and increased dependency on others.¹⁹ However, after heart transplantation, patients may live their lives with continuing unpredictability. The post-transplantation regimen with its requirements for close medical follow-up and multiple drugs is a vivid reminder that the patient has not returned to normal health. Patients may be faced with the fear of physiologic rejection of the new heart and the ongoing possibility of death.

The findings from our current study also indicate that mood disorders are highly prevalent among female heart transplant recipients. Previous researchers have shown similar findings. Dew and colleagues¹ found that anxiety and depression levels rise in the early post-transplant period but rapidly decrease over time in 67% of the patients. In a more recent study, Dew et al⁴ documented poor psychologic adjustment to heart transplantation as a major contributor to reduced QOL and increased physical morbidity beyond the first 12 to 18 months after transplantation. Likewise, in conducting a longitudinal follow-up of heart transplant recipients, Bunzel and Laederach-Hofmann²⁰ found evidence to support deterioration in emotional well-being among these patients 5 years after their heart transplant. Given these overall findings, we can conclude that heart transplantation is not a cure for end-stage heart disease, but rather an alternative form of treatment potentially involving both medical and psychosocial problems.

The QOL scores in our sample of female heart transplant recipients were moderately low, but were similar to total QOL scores of female transplant candidates in a separate study.²¹ In a comparative analysis of several QOL studies before and after heart transplantation, Dew and colleagues² also found that a majority of studies comparing transplant recipients to candidates did not show gains in

TABLE IV Predictors of mental component score ($N = 50$)

Variable	Adjusted R^2	F	p
Age	0.069	4.57	0.038
Hope	0.597	62.66	0.000
Depression	0.695	15.66	0.000

the domain of psychologic health—that, although the functional abilities of the patients improved greatly, their psychologic well-being (mood disorders and emotional states) remained unchanged. These researchers addressed the need to implement a standardized approach to assess and treat (i.e., pharmacologic interventions) psychologic distress immediately after transplant surgery and during the recovery phase.²

There was a strong association between hope, mood states and MCS measures of QOL in the current study. A similar study in the heart transplant literature documented the association of hope (or positive expectations) with good mood, adjustment to illness and QOL, even in patients who experienced health setbacks.²² Both our study and the study by Leedham and colleagues²² are similar to existing research, which supports that those who are hopeful experience improved psychologic well-being. Therefore, interventions that foster hope among heart transplant recipients may be the key to improved psychosocial adaptation and better QOL. Likewise, interventions, including pharmacologic therapies that improve mood states, may also enhance hope.

Hope and mood states were not associated with the PCS measures of QOL in our study. Similarly, Dew and colleagues⁴ reported the lack of association between functional abilities and disease severity and psychologic adjustment after heart transplantation. This suggests that improvements in functional ability may not necessarily result in higher levels of perceived hope or a decrease in mood disorders. More importantly, our findings imply that better functional status may not necessarily result in better psychologic adaptation.

Suggestions for future research would be to include subjects from varied ethnic backgrounds and to recruit subjects randomly from various heart transplant clinics. This sampling approach will increase the generalizability of the findings. Likewise, a comparative study that includes a sample of post-transplant men is also needed to examine gender differences in feelings of hope, mood states and psychologic assessment after surgery. If the results of this study are confirmed with a larger and more diverse sample, an intervention study designed to foster hope in heart transplant recipients would be an important next step to clarify the role of hope and mood states on patients' QOL. We also need to examine other factors that may potentially affect mood states and QOL in this high-risk patient population, including pre-transplant psychiatric his-

tory, longer hospitalization, more impaired physical functional status and lower social support from caregiver and family in the peri-operative period. Similarly, an assessment of other factors that could potentially influence hope, including illness-related factors and environmental factors, will also be needed to provide a more comprehensive understanding of hope in heart transplant recipients. Finally, additional exploratory studies are needed to examine whether hope contributes to effective coping after heart transplantation.

In summary, a growing body of evidence supports the notion that hope, or having an optimistic outlook, has a positive effect on individuals dealing with illness or an illness event.²³ Our study supports this notion and provides valuable information to support the need to develop and test interventions that foster hope as a means to improve mood states and QOL in female heart transplant patients. Psychosocial interventions that enhance perceptions of hope could improve both the QOL and survival of female heart transplant patients, especially those with high levels of psychologic distress.

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