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Mental Health Support for Heart Transplant Recipients and Candidates: Nurturing Well-Being Beyond Surgery

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Abstract

Background/Objectives: Heart transplantation is a life-saving procedure for patients with end-stage heart failure, yet it involves significant psychological and emotional challenges throughout its various stages. International guidelines recommend a multi-professional approach to the care of these patients and a psycho-social assessment for listing. The recommendations focus on content aspects, but not on the psychometric measure to be administered to patients as part of the assessment. Therefore, the purpose of this study is to provide the preliminary results of administering the protocol used by our center, measuring coping strategies, cognitive functioning, quality of life, and psychological distress in a sample of patients who are candidates for and undergo cardiac transplantation, and to observe any variations after the procedure. Methods: We conducted a comprehensive psychological-clinical assessment involving 40 patients, focusing on psychosocial functioning, cognitive reserves, mental health, and coping strategies. Tools such as the Stanford Integrated Psychosocial Assessment for Transplantation (SIPAT), Beck Depression Inventory-II (BDI-II), Montreal Cognitive Assessment (MoCA), General Anxiety Disorder 7 (GAD-7), and Medical Outcomes Survey Short Form 36 (SF-36) were employed to evaluate readiness for transplantation and post-transplant adaptation. Results: Results showed high levels of clinical anxiety (52.5%) and low perceived physical health (98%) before the transplant, while post-operative evaluations indicated reduced anxiety (13.51%) and depressive symptoms (10.81%), along with improved psychological well-being and reintegration into daily life. Conclusions: These results show improvement in physical and cognitive levels, accompanied by a state of enhanced psychological well-being after transplantation. A longitudinal psychological approach, from pre-transplant screening to post-discharge follow-up, is needed to address distress, improve coping mechanisms, and promote treatment adherence. This integrative strategy is critical to improving the quality of life and long-term outcomes for heart transplant recipients.

Keywords: heart transplantation; psychological support; psychosocial assessment; coping strategies; quality of life

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1. Introduction

Heart failure has been defined as a global pandemic, with approximately 64.3 million people suffering from it worldwide in 2017 [1]. Its prevalence is expected to increase due to improved survival following a heart failure diagnosis associated with the availability of

life-saving, evidence-based treatments and the overall longer life expectancy of the general population. Living with heart failure can be seen as a condition that shakes the patient's well-being, both physically, due to the clinical symptoms, and psychologically, due to the emotional burden.

The emotional, cognitive, and behavioral responses to the marked existential changes imposed by heart disease make coping with the new condition even more difficult for the patient. After the diagnosis, patients may experience a spectrum of emotions. Indeed, people with heart disease report the occurrence of psychopathological conditions with a frequency of 20% to 40% [2]. Statistical data show that 70–80% of patients develop anxiety symptoms after a cardiovascular event [3], and anxiety is commonly recognized because of such episodes due to impaired cardiac function, unpleasant physiological sensations, limitations in performing daily activities, and the perception of the disease as a set of unpredictable events. These factors have important repercussions on patients' quality of life and predispose them to experience prolonged states of anxiety [4]. The path that a patient must go through for inclusion in the transplant waiting-list is a complex process in which psychophysical stress and psychosocial difficulties can compromise the patient's adaptation, not only with the dual life/death perspective, but with the fear that the organ may not arrive in time: according to some studies, this is described by patients as the most stressful period ever experienced [5].

The multi-professional approach to heart disease patients' care is highly recommended by international guidelines, and in Italy, the importance of psychological interventions in this area has been highlighted through the volume "Interventi Psicologici in Cardiologia: Indicazioni Per La Pratica Professionale" by the national board of psychologists in 2024 [6]. However, the psychosocial assessment of candidates for treatment of advanced heart failure remains largely subjective [7]. There are recommendations that focus on the content and process aspects of the psychosocial assessment, but not on the instruments or psychometric measures that may be chosen. Therefore, the recommendations were developed to be flexible enough to adapt to the unique characteristics of each patient and transplant program [8]. Therefore, the purpose of this study is to provide the preliminary results of administering the protocol used by our center, measuring coping strategies, cognitive functioning, quality of life, and psychological distress in a sample of patients who are candidates for and undergo cardiac transplantation, and to observe any variations after the procedure.

2. Materials and Methods

Our heart transplant center includes professional psychologists within the multidisciplinary team involved in the program. Psychologists are linked to assessment work for suitability for transplantation, assistance, and psychological support for the patient and the family members who assist him during the entire process. Therefore, this figure is present throughout the three phases of the program:

1. Pre-transplant phase;
2. Post-transplant;
3. Post-discharge.

During the pre-transplant phase, all patients with end-stage heart failure who are screened for inclusion on the transplant waitlist undergo a psychological evaluation that includes a comprehensive survey of their psychosocial functioning to ascertain their suitability for transplantation [9]. This assessment can be performed in inpatient or outpatient settings, according to the patient's clinical condition. In fact, some patients were excluded from the study due to critical clinical conditions or intensive care unit stay that did not allow for a comprehensive psychosocial assessment. Therefore, in the first phase, the study

sample consisted of 40 patients: 18 patients were evaluated during ordinary hospitalization, and 22 were evaluated on an outpatient basis. During the psychosocial assessment, the following aspects are considered:

- Acknowledgment and awareness of the disease state, transplant process, and willingness to undergo the treatment.
- Personality profile and cognitive state.
- Recognition of coping strategies.
- Evaluation of the social support system.

Patients are called to undergo a psychological interview in which they express their experiences related to their state of health and various emotional reactions due to the challenge of accepting the new organ and life. It is important to note that in the Italian transplantation guidelines, there are currently no established assessment procedures for performing an accurate pretransplant psychosocial assessment [10]. The presence of adverse psychosocial factors before transplant has been found to be associated with unfavorable postsurgical outcomes and nonadherence to treatment. These factors include severe mental disorders, substance and alcohol abuse, active suicidal ideation, social and behavioral dysfunction, and lack of therapeutic compliance [5]. Therefore, monitoring the identified risk factors and, if necessary, the postponement of listing is recommended until these are satisfactorily addressed. If these factors persist, the procedure is not recommended. In order to improve the prediction of the medical and psychosocial outcomes of post-transplant patients, the use of the Stanford Integrated Psychosocial Assessment for Transplant (SIPAT) [10] is recommended. It is a screening tool that includes 18 psychosocial factors, grouped into 4 domains that evaluate the following:

1. The patient's level of readiness and disease management;
2. The level of readiness of the social support system;
3. Psychological stability and psychopathology;
4. The effect of substance use.

To obtain a complete overview of the patient's psychosocial functioning, also for the purposes of using the SIPAT, information was collected through psychological interviews and cognitive and psychodiagnostic tests, including the following:

- Montreal Cognitive Assessment (MoCA) [11]: a cognitive status screening tool that evaluates the following domains: attention and concentration, executive function, memory, language, visual–constructive skills, abstraction, calculation, and orientation. The MoCA has excellent test–retest reliability, and the internal consistency on the items in the MoCA is reported as 0.83 [11].
- Cognitive Reserve Index questionnaire (CRIq) [12]: provides a standardized and psychometrically controlled measure of cognitive reserve. It is short and easy to administer, and thus can be easily included in standard assessments without an effort for the subject in terms of time and cognitive resources [12].
- Beck Depression Inventory-II (BDI-II) [13]: 21-item self-administered instrument to detect the severity of depression in adults and adolescents from the age of 13 and older. It is based on the criteria for the diagnosis of depressive disorders listed in the fourth version of the American Psychiatric Association's Diagnostic and Statistical Manual of Mental Disorders (DSM-IV) (1994). It is designed as an improvement and update of the first version of the Beck Depression Inventory (BDI-I). Internal consistency was found to be $\alpha = 0.92$; the test–retest correlation of 0.93 was significant. It has excellent psychometric characteristics, further improved from previous versions [14].

- General Anxiety Disorder 7 (GAD-7) [15]: a 7-item self-report instrument for screening generalized anxiety disorder. It is one of the most important instruments for measuring anxiety symptoms [15]. It has adequate validity and reliability [16].
- Brief Cope [17]: shortened version (28 items) of the COPE self-report questionnaire that investigates reactions to stressful events. The Brief COPE has been shown to demonstrate sufficient internal consistency among heart disease patients [18].
- Medical Outcomes Survey Short Form 36 (SF-36) [19]: a 36-item self-report instrument that assesses perceived levels of physical and mental health and related quality of life. It is a valid and reliable instrument that meets the standards suggested in the literature in terms of feasibility, psychometric testing, and interpretability.

The information obtained through psychological interviews and administration of cognitive and psychodiagnostic tests must be considered to complete the SIPAT and obtain a total score that suggests the extent to which the patient is an acceptable candidate for listing. This score ranges from a minimum of 0 to a maximum of 120 and is interpreted based on different levels of acceptability.

For an "Excellent Candidate", it is recommended to list without reservations; for a "Good Candidate", it is recommended to list, although monitoring of identified risk factors may be required. Instead, for a "Minimally Acceptable Candidate", listing and identified risk factors must be satisfactorily addressed before a second consideration. For a "Poor Candidate," deferral is recommended, while the identified risks are satisfactorily addressed. For a "high-risk candidate", surgery is not recommended while identified risk factors continue to be present.

If elements of psychological distress are present, related to and caused by the poor quality of life that the condition entails, psychological support interviews are provided to promote better coping skills and mental well-being for the purposes of transplantation. For candidates with minimal and/or poor acceptability, recommendations are provided to modify problematic behaviors (e.g., use of alcohol, nicotine, and/or illicit substances; denial or ambivalence about transplantation) and correct deficiencies to promote better adherence to treatment and an optimal condition for listing. If the conditions are still suboptimal, a recommendation should be made for the patient to be removed from the transplant list.

The post-transplant phase can be divided into two stages. The first is the post-operative course in the intensive care unit, where the patient experiences a condition of notable regression and vulnerability due to the biological and mental stress suffered: reception and containment by the treating team are fundamental. The second moment is represented by the stay in the ward, where the psychologist, through clinical interviews, provides psychological support if any moments of emotional difficulties are noticed. Thoughts about the deceased donor may be encountered, with both feelings of gratitude and guilt, long hospital stay, either before or after the transplantation, as well as any possible complication that may affect an already present condition of stress and suffering. This can promote greater treatment compliance (e.g., engagement in physiotherapy exercises, effective collaboration with medical staff) and mental well-being so that patients are motivated and proactively involved in their own care during the postoperative course.

It is important to conduct a psychological interview before discharge to evaluate the state of psycho-physical well-being and ability to adapt to a new lifestyle [10].

The post-discharge phase is the one in which patients return to their socio-family context and adapt to life after transplant, which involves dealing with aspects such as after-effects of the hospital stay and side effects of pharmacological therapies [10]. For these reasons, follow-up psychological evaluations in outpatient settings, scheduled at 1 month, 6 months, and 1 year after transplantation, are considered appropriate. These evaluations include an initial clinical interview to investigate treatment compliance and

adaptation to the new lifestyle, and a psychometric part, administered as a re-test (MOCA, GAD-7, BDI-II, SF-36). This allows for monitoring the patient's progress by comparing the pre-transplant status with the current one and identifying any distressing situations that require psychological assistance. In this study, 37 out of 40 patients received evaluation after 1 month, 2 patients are awaiting transplantation, and 1 has died. In addition, only 21 out of 40 patients received evaluation after 6 months because the time for retesting had not yet elapsed.

In addition to psychological and cognitive assessments, demographic data were collected for all participants. These included age, sex, and years of education. Descriptive statistics were used to analyze and report these variables to provide a comprehensive overview of the sample's baseline characteristics.

For the pre-transplant evaluation analyses, all patients placed on the transplant waiting list (n = 40) were considered (Table 1). Of these 40 patients, 37 underwent transplantation and subsequently received a post-transplant psychological evaluation (either at 1 month or 6 months after surgery) (Table 2). For the descriptive analyses of the post-transplant assessments, 3 patients from the original group were excluded: 2 had not yet undergone transplantation, and 1 had died following the transplant. Among the 37 transplanted patients who completed a psychological evaluation 1 month after surgery, 21 also underwent a second evaluation 6 months post-transplant (Table 3). In total, 21 of the 40 patients completed a psychological assessment at 6 months after surgery. Patients assessed more than 1 year after transplantation were not included in the data collection or results, as the appropriate time frame for psychological evaluation had not yet elapsed. Data were collected between March and December 2024 and covered both the pre-transplant and post-transplant phases. Of the total sample (N = 40), 38 patients underwent transplantation between March and November 2024. Among them, 37 received a psychological evaluation one month after transplantation, while one patient was not evaluated due to death. Of the 37 transplanted patients, 21 were transplanted between March and June 2024, making it possible to conduct both the 1-month and 6-month post-transplant psychological assessments. The remaining 16 patients were transplanted between July and November 2024 and have completed the 1-month psychological evaluation, but the time required for the 6-month assessment has not yet elapsed.

Table 1. Percentages of 40 patients' test results in pre-transplant phase.

Psychological Assessment	Percentage of Test Results
SIPAT	
Excellent candidate	17.5%
Good candidate	80%
Minimally Acceptable candidate	2.5%
Poor candidate	-
High-risk candidate	-
MOCA	
Impaired	17.5%
Borderline	42.5%
Normal	40%

Table 1. *Cont.*

Psychological Assessment	Percentage of Test Results
CRIq	
High	5%
Medium-high	20%
Medium	62.5%
Medium-low	12.5%
Low	-
BRIEF-COPE	
Approach	52.5%
Acceptance	90%
Active Coping	90%
Positive restructuring	70%
Avoidance	19.35%
Self-distraction	42.5%
BDI-II	35%
GAD-7	52.5%
SF-36	
Physical health index	98%
Mental health index	48%

Table 2. Percentages of patients (*n* = 37) with altered test results in post-transplant phase.

Psychological Assessment	Percentage of Test Results
MOCA	
Impaired	13.51%
Borderline	40.54%
Normal	45.95%
BDI-II	10.81%
GAD-7	13.51%
SF-36	
Physical health index	91.89%
Mental health index	24.32%

Table 3. Percentages of patients (*n* = 21) with altered test results in post-discharge phase.

Psychological Assessment	Percentage of Test Results
MOCA	
Impaired	9.52%
Borderline	28.57%
Normal	61.91%
BDI-II	9.52%
GAD-7	14.29%

Table 3. *Cont.*

Psychological Assessment	Percentage of Test Results
SF-36	
Physical health index	57.14%
Mental health index	33.33%

3. Results

Demographic Characteristics of the Sample

The study sample consisted of 40 patients undergoing psychological assessment prior to heart transplantation. The demographic profile is as follows:

- Mean age: 59 years (SD = 0.81);
- Sex: 35 male patients (88%), 5 female patients (12%);
- Education level: Median years of schooling was 10 (SD = 4.18).

These data reflect a predominance of middle-aged males with medium educational attainment, consistent with the demographic distribution typically observed among heart transplant candidates.

In this observational study, because of the small number of patients included, data were analyzed by descriptive analyses, such as mean, standard deviation, and frequency distributions. The above psychometric tests were administered to 40 patients: 35 patients (88%) were male and 5 patients (12%) were female. The mean age was 59 years (SD = 0.81), and the median educational qualification was 10 years (SD = 4.18). Using the SIPAT as a guiding tool for patient psychosocial assessment, it was found that 80% of our sample was in the "good candidate" range and 17.5% were within the range of "excellent candidate." Only 2.5% of our patients fell into the "minimally acceptable candidate" range. As for cognitive reserve, measured by CRIq, our sample is made up as follows: 62.5% have a "medium" cognitive reserve index, 20% a "medium-high" index, 12.5% a "medium-low" index, and only 5% show a "high" cognitive reserve index. There are no patients with a "low" cognitive reserve index. The analysis of the scores obtained on the screening tool MOCA, for the assessment of cognitive status, shows that the mean score of the total sample is 24.6 (SD = 3.29): in fact, 42.5% are in a borderline level of cognitive function, 40% have a cognitive level in the normal range, and only 17.5% have a compromised level.

It is observed that the most used coping strategies in our sample are approach strategies (52.5%), more so than avoidance strategies (19.35%). Specifically, the analysis of Brief-Cope shows that the most frequently used approach strategies are acceptance (90%), active coping (90%), and positive restructuring (70%). Self-distraction is the avoidance strategy with the highest percentage (42.5%).

Regarding quality of life, physical health (ISF) and mental well-being (ISM) scores given by the SF-36 were studied. Thirty-nine patients showed low levels of perceived physical health status (98%), while 19 patients had below normal levels of perceived mental health (48%).

GAD-7 and BDI-II were used for the assessment of psychological distress; it emerged that 52.5% of our sample had clinical anxiety, while only 35% had depression.

A total of 37 of 40 patients were evaluated 1 month after transplantation. It is possible to observe that the mean score on the cognitive screening tool MOCA was 25.24 (SD = 3.21) and that 45.95% had a cognitive level in the normal range, 40.54% were in the borderline level of cognitive function, and 13.51% had a compromised level. The SF-36 questionnaire showed that 34 patients had low levels of perceived physical health status (91.89%), while 9 patients had below normal levels of perceived mental health (24.32%). Furthermore,

the assessment of psychological distress reported low rates of both anxiety (10.81%) and depressive (13.51%) symptoms.

Of 40 patients, 21 underwent the psychological evaluation 6 months after surgery. The mean score on the cognitive screening tool MOCA was 25.38 (SD = 2.92), with 61.91% showing a cognitive level in the normal range, 28.57% in the borderline level, and 9.52% with a compromised level. The SF-36 questionnaire showed that 12 patients had low levels of perceived physical health status (57.14%), while 7 patients had below normal levels of perceived mental health (33.33%). Furthermore, the assessment of psychological distress reported low rates of both anxiety (14.29%) and depressive (9.52%) symptoms.

4. Discussion

Transplantation guidelines emphasize that the psychologist should routinely evaluate all patients selected for heart transplantation before they are placed on the waiting list by conducting a psychosocial assessment [6]. Organ transplantation is a highly complex procedure that can result in significant changes for patients with terminal failure, physically, emotionally, and socially. The evaluation of transplant candidates includes potential clinical, ethical, and social factors. Therefore, an accurate and standardized psychosocial assessment process should include a thorough investigation of cognitive, behavioral, psychological, and social risk factors that may affect the transplantation process and post-transplant phase [10]. In this regard, Maldonado et al. pointed out that psychosocial inclusion criteria are less standardized than medical criteria, which, in contrast, are well defined for each organ [20]. Therefore, in our transplant center, we decided to use the SIPAT as a guiding tool for the psychosocial assessment of patients: it was found that most of our sample had positive scores for transplant list placement. In fact, the two prevalent ranges were "good candidate" (80%) and "excellent candidate" (17.5%).

Assessment of cognitive function is included in the SIPAT checklist because it has been found in the literature that cognitive dysfunction is common in patients with HF [21]. Indeed, the scientific literature supports the view that cardiac dysfunction leads to impaired cerebral blood flow and chronic regional hypoperfusion of brain areas that predispose to cognitive decline [22]. Indeed, when we analyzed the global MOCA test score of our sample, we found that 60% of the patients had abnormal scores: 42.5% were in the borderline range of cognitive functioning, and 17.5% had an impaired level. Thus, these preliminary results seem to be in line with previous studies indicating that patients with end-stage heart failure have a significant decline in cognitive function [23]. In the transplantation process, among the psychosocial domains to be assessed, physical functioning and consequent quality of life have a distinct importance. Indeed, pre-transplant quality of life may be hampered by worsening symptoms, leading to difficulties in performing activities of daily living and associated emotional impairment [24]. Only a few studies have focused on the psychological findings and psychic discomfort of these patients in the pre-transplant phase [25,26]. The emotional, cognitive, and behavioral responses to these changes make it even more difficult for the patient to cope with the new living condition and the course of the disease. In fact, people with heart disease report the onset of psychopathological conditions in 20–40% of cases [1,2]. Depression and anxiety are common psychological comorbidities, often associated with poor clinical outcomes; their recognition, however, is not always straightforward, mainly because of the overlap between cardiac and psychological pathology. The data we have today indicate comorbidity with depressive symptoms in about 20% of patients with heart failure and comorbidity with anxiety symptoms as high as 40% [6].

In our preliminary study, it was found that in the pre-transplant phase, 52.5% of the sample had clinical anxiety symptoms, 35% had depressive symptoms, and 98% had low

levels of perceived physical health, in line with what is found in the literature. Another aspect evaluated in our study is coping. Traditionally, coping has been defined as a special category of adaptation elicited in normal individuals by unusually challenging circumstances [27]. Patients' coping strategies may be particularly relevant in heart failure, as it is a chronic and severe condition that requires vigilance over fluctuating physical symptoms and adherence to a complicated treatment regimen [28]. Therefore, not only can they help cope with the burden and restrictions imposed by the disease, but also positively influence the course of chronic conditions. It is observed that the coping strategies most used by our sample were approach coping (52.5%), compared to avoidance coping (19.35%). It is observed in the literature that anxious patients with heart failure vary in the degree to which they adopt avoidant coping strategies [28]. Although about half of our sample presents with anxious symptoms, approach coping strategies such as acceptance (90%), active coping (90%), and positive restructuring (70%) appear prevalent. In fact, active coping and acceptance have a positive relationship with psychophysical well-being and a negative relationship with stress, so they can be considered adaptive or functional strategies [29]. Considering the data obtained from our study, it would be possible to hypothesize, therefore, that a long duration of heart disease leads the patient to develop an adaptation to the required lifestyle and a greater determination and motivation in facing transplantation as the only possible therapeutic solution.

Most studies show that quality of life improves significantly after transplantation and remains unchanged for a long time, including both an overall improvement and in the physical domain and greater psychological well-being [30,31]. Analyzing the frequency distribution of our sample after transplant, we observe that 91.89% of patients still have low levels of perceived physical health after 1 month. After 6 months, there is a reduction in the percentage of patients with low levels of physical functioning (57.14%). Similarly, while at the pre-transplant stage we observed that most of the sample had abnormal MOCA scores, after 6 months we observed an increase in the number of patients with normal cognitive functioning (61.91%).

In the pre-transplant phase, patients experience distress and nonspecific subclinical symptoms that generally reflect anxious, depressive, and somatic symptoms: the degree of these complaints is high before surgery and decreases soon after [30,32]. An improvement in psychological distress is observed during the post-transplant phase. The literature shows that the prevalence rates of depressive and anxious symptoms decrease to 15–17% in the first year after transplantation [30]. Indeed, in our study, the number of patients with anxious (10.81%) and depressive (13.51%) symptoms after 1 month decreases, maintaining a stability of psychological well-being even after 6 months. In the post-transplant phase, although most of the sample did not report psychological distress, 9.52% of patients had depressive symptoms and 14.29% anxious symptoms. In these cases, the literature recommends cognitive–behavioral psychotherapeutic interventions and relaxation techniques to reduce the state of psychological distress and promote the improvement of patients' quality of life [6]. These preliminary results, in agreement with previous studies, allow us to hypothesize that after transplantation, there is improvement at the physical and cognitive levels, accompanied by a state of greater psychological well-being. The reduction in anxiety and depressive symptoms over time suggests that psychological distress may decrease as patients regain stability in their daily lives. In addition, new post-transplant cardiac function generates not only improved physical condition and quality of life, but also tends to normalize cognitive function due to improved cerebral reperfusion. This observational study can serve as the basis for a future prospective study with the goal of expanding the sample size and following patients long-term. This would allow for more

in-depth statistical analysis and further exploration of factors influencing psychological and cognitive adjustment after transplantation.

The demographic characteristics of our sample, particularly the predominance of males and the mean age of 59 years, are consistent with those reported in other national and international studies on heart transplant candidates. These factors may influence coping strategies and psychological responses to transplantation. Future studies with larger and more diverse samples will allow us to explore the influence of demographic variables such as sex and age on psychological outcomes in greater detail.

5. Limitations

Since this was an observational study with a small sample size, it was not possible to perform more in-depth statistical analyses, only descriptive ones. Another limitation is the timing between test–retest evaluations: in our study, there are patients who have an evaluation at the pre-transplant stage because they are on the list but not yet transplanted; other patients do not have an evaluation at 6 months because the necessary time has not yet elapsed. Another limitation is the clinical conditions of the patients: in the pre-phase, patients are often admitted to critical care settings (e.g., intensive care unit, intubated) and cannot have a full evaluation because of the unstructured setting for the interview and unstable physical condition. In the post-stage, complications occurring after surgery and/or death interfere with data collection to obtain a homogeneous sample. However, this work lays the foundation for a future prospective study with the goal of expanding the sample, obtaining all test–retest assessments for each patient, and presenting a statistically significant pre-post analysis of psychological and quality-of-life variables during the transplantation process.

6. Conclusions

Heart transplantation is a highly complex medical procedure that imposes profound physical, psychological, and social challenges. Our preliminary findings emphasize the critical role of a longitudinal and integrated psychological–clinical support process throughout the transplant journey. The observed improvements in anxiety, depression, cognitive functioning, and perceived quality of life after transplant highlight the potential benefits of structured psychosocial assessment and support protocols. These findings are consistent with the existing literature and suggest that early and continuous psychological intervention may contribute positively to post-operative outcomes and patient well-being.

However, these results must be interpreted with caution due to the limited sample size and the descriptive nature of the data analysis. Further research with a larger and more diverse population, longer follow-up periods, and inferential statistical methods is essential to validate these preliminary trends and explore potential moderating factors such as sex, age, and cognitive reserve.

In conclusion, integrating psychological care within a multidisciplinary transplant team is not only feasible but also potentially beneficial. Personalized psychological interventions, continuous follow-up, and broader use of psychometric tools should be considered key components of transplant programs aimed at optimizing both clinical and psychosocial outcomes.

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Institutional Review Board Statement: The study was conducted in accordance with the Declaration of Helsinki, and approved by the Institutional Review Board of Territorial Ethics Committee-Azienda Ospedaliero-Universitaria "Consorziale Policlinico" of Bari (protocol code: Study No. 7835 - Prot. No. 0038211/07.05.2024; date: 24 April 2024), the data from March 2024 derive from a retrospective review of existing clinical records, for which our institution's standard practice already allowed such analysis under institutional governance.

Informed Consent Statement: Informed consent was obtained from all participants involved in the study.

Data Availability Statement: The data of this research are available upon request to interested parties.

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Conflicts of Interest: The authors declare no conflicts of interest.

Abbreviations

The following abbreviations are used in this manuscript:

BDI-II.	Beck Depression Inventory-II
CRIq	Cognitive Reserve Index Questionnaire
DiMePRe-J	Department of Precision and Regenerative Medicine and Ionian Area
GAD-7	General Anxiety Disorder-7
MoCA	Montreal Cognitive Assessment
SF-36	Medical Outcomes Survey Short Form-36
SIPAT	Stanford Integrated Psychosocial Assessment for Transplantation

References

1. Bragazzi, N.L.; Zhong, W.; Shu, J.; Abu Much, A.; Lotan, D.; Grupper, A.; Younis, A.; Dai, H. Burden of heart failure and underlying causes in 195 countries and territories from 1990 to 2017. *Eur. J. Prev. Cardiol.* **2021**, *28*, 1682–1690. [CrossRef]
2. Sommaruga, M.; Angelino, E.; Della Porta, P.; Abatello, M.; Baiardo, G.; Balestroni, G.; Bettinardi, O.; Callus, E.; CiracÃ, C.; Omodeo, O.; et al. Best practice in psychological activities in cardiovascular prevention and rehabilitation: Position Paper. *Monaldi. Arch. Chest Dis.* **2018**, *88*. [CrossRef]
3. Kubzansky, L.D.; Kawachi, I.; Weiss, S.T.; Sparrow, D. Anxiety and coronary heart disease. A synthesis of epidemiological, psychological, and experimental evidence. *Ann. Behav. Med.* **1998**, *20*, 47–58. [CrossRef]
4. Wang, Z.; Qin, H.; Chen, G.; Dai, Y.; Cai, Y.; Cheng, X.; Qian, Y.; Chu, M.; Lu, X. Anxiety is associated with increased risk for atrial cardiopathy. *Acta Neurol. Belg.* **2020**, *120*, 1383–1388. [CrossRef] [PubMed]
5. Lovera, G.; Basile, A.; Bertolotti, M.; Comazzi, A.M.; Clerici, C.A.; Gandione, M.; Mazzoldi, M.; Rupolo, G.; Feltrin, A.; Ponton, P. L'assistenza psicologica nei trapianti d'organo. *Ann. Dell'istituto Super. Di. Sanità* **2000**, *36*, 225–246.
6. Consiglio Nazionale Ordine degli Psicologi. Interventi psicologici in cardiologia: Indicazioni per la pratica professionale e per un nuovo approccio normativo. *Quad. Consult. Naz. Soc. Sci.* **2024**, 1–50.
7. Bui, Q.M.; Allen, L.A.; LeMond, L.; Brambatti, M.; Adler, E. Psychosocial Evaluation of Candidates for Heart Transplant and Ventricular Assist Devices: Beyond the Current Consensus. *Circ. Heart Fail.* **2019**, *12*, e006058. [CrossRef]
8. Dew, M.A.; Di Martini, A.F.; Dobbels, F.; Grady, K.L.; Jowsey-Gregoire, S.G.; Kaan, A.; Kendall, K.; Young, Q.R.; Abbey, S.E.; Butt, Z.; et al. The 2018 ISHLT/APM/AST/ICCAC/STSW Recommendations for the Psychosocial Evaluation of Adult Cardiothoracic Transplant Candidates and Candidates for Long-term Mechanical Circulatory Support. *Psychosomatics* **2018**, *59*, 415–440. [CrossRef]
9. Rocco, M.; Campagna, E.; Barucco, T.; Ceresa, L. La valutazione psicologica nel pre- e nel post-trapianto. *Atti Della Accad. Lancisiana* **2019**, *63*, 165–167.
10. Bottesi, G.; Granziol, U.; Forza, G.; Volpe, B.; Feltrin, A.; Battermann, F.; Cavalli, C.; Cillo, U.; Gerosa, G.; Fraiese, A.; et al. The Psychosocial Assessment of Transplant Candidates: Inter-Rater Reliability and Predictive Value of the Italian Stanford Integrated Psychosocial Assessment for Transplantation (SIPAT). *Psychosomatics* **2020**, *61*, 127–134. [CrossRef]

11. Nasreddine, Z.S.; Phillips, N.A.; Bédirian, V.; Charbonneau, S.; Whitehead, V.; Collin, I.; Cummings, J.L.; Chertkow, H. The Montreal Cognitive Assessment, MoCA: A Brief Screening Tool For Mild Cognitive Impairment. *J. Am. Geriatr. Soc.* **2005**, *53*, 695–699. [CrossRef] [PubMed]
12. Nucci, M.; Mapelli, D.; Mondini, S. Cognitive Reserve Index questionnaire (CRIq): A new instrument for measuring cognitive reserve. *Aging Clin. Exp. Res.* **2012**, *24*, 218–226. [CrossRef] [PubMed]
13. Ghisi, M.; Montano, A.; Sanavio, E.; Sica, C. *Beck Depression Inventory*, 2nd ed.; Adattamento Italiano: Manuale; Organizzazioni Speciali: Florence, Italy, 2006.
14. Montano, A.; Flebus, G.B. Presentazione del Beck Depression Inventory-Seconda edizione (BDI-II): Conferma della struttura bifattoriale in un campione di popolazione italiana. *Psicoter. Cogn. E Comport.* **2006**, *12*, 67–82.
15. Spitzer, R.L.; Kroenke, K.; Williams, J.B.; Löwe, B. A brief measure for assessing generalized anxiety disorder: The GAD-7. *Arch. Intern. Med.* **2006**, *166*, 1092–1097. [CrossRef]
16. Bolgeo, T.; Di Matteo, R.; Simonelli, N.; Dal Molin, A.; Lusignani, M.; Bassola, B.; Vellone, E.; Maconi, A.; Iovino, P. Psychometric properties and measurement invariance of the 7-item General Anxiety Disorder scale (GAD-7) in an Italian coronary heart disease population. *J. Affect Disord.* **2023**, *334*, 213–219. [CrossRef]
17. Carver, C.S. You want to measure coping but your protocol's too long: Consider the brief COPE. *Int. J. Behav. Med.* **1997**, *4*, 92–100. [CrossRef]
18. Shen, B.J.; McCreary, C.P.; Myers, H.F. Independent and mediated contributions of personality, coping, social support, and depressive symptoms to physical functioning among patients in cardiac rehabilitation. *J. Behav. Med.* **2004**, *27*, 39–62. [CrossRef]
19. Apolone, G.; Mosconi, P. The Italian SF-36 health survey: Translation, validation and norming. *J. Clin. Epidemiol.* **1998**, *51*, 1025–1036. [CrossRef]
20. Maldonado, J.R. The Psychosocial Evaluation of Transplant Candidates. In *Psychosocial Care of End-Stage Organ Disease and Transplant Patients*; Sher, Y., Maldonado, J., Eds.; Springer: Cham, Switzerland, 2019.
21. Alagiakrishnan, K.; Mah, D.; Dyck, J.R.; Senthilselvan, A.; Ezekowitz, J. Comparison of two commonly used clinical cognitive screening tests to diagnose mild cognitive impairment in heart failure with the golden standard European Consortium Criteria. *Int. J. Cardiol.* **2017**, *228*, 558–562. [CrossRef]
22. Ovsenik, A.; Podbregar, M.; Fabjan, A. Cerebral blood flow impairment and cognitive decline in heart failure. *Brain Behav.* **2021**, *11*, e02176. [CrossRef]
23. Mapelli, D.; Bardi, L.; Mojoli, M.; Volpe, B.; Gerosa, G.; Amodio, P.; Daliento, L. Neuropsychological profile in a large group of heart transplant candidates. *PLoS ONE* **2011**, *6*, e28313. [CrossRef]
24. Helito, R.A.B.; Branco, J.N.R.; D'Innocenzo, M.; Machado, C.R.; Buffolo, E. Qualidade de vida dos candidatos a transplante de coração. *Braz. J. Cardiovasc. Surg.* **2009**, *24*, 50–57. [CrossRef] [PubMed]
25. Langenbach, M.; Pietsch, D.; Köhle, K. Emotional stress and subjective body experience of heart transplantation candidates. *Transpl. Proc.* **2006**, *38*, 735–736. [CrossRef] [PubMed]
26. Cavalli, C.; Tarzia, V.; Marini, M.; Gregori, D.; Casella, S.; Bottio, T.; Toscano, G.; Fraiese, A.P.; Gambino, A.; Volpe, B.; et al. A comparison of quality of life and psychological distress in heart transplantation patients at adult and pediatric ages. *Clin. Transplant.* **2019**, *33*, e13335. [CrossRef]
27. Costa, P.T., Jr.; Somerfield, M.R.; McCrae, R.R. Personality and Coping: A Reconceptualization. In *Handbook of Coping: Theory, Research, Applications*; Zeidner, M., Endler, N.S., Eds.; John Wiley & Sons: New York, NY, USA, 1996; pp. 44–61.
28. Eisenberg, S.A.; Shen, B.J.; Schwarz, E.R.; Mallon, S. Avoidant coping moderates the association between anxiety and patient-rated physical functioning in heart failure patients. *J. Behav. Med.* **2012**, *35*, 253–261. [CrossRef]
29. García, F.E.; Barraza-Peña, C.G.; Wlodarczyk, A.; Alvear-Carrasco, M.; Reyes-Reyes, A. Psychometric properties of the Brief-COPE for the evaluation of coping strategies in the Chilean population. *Psicol. Reflex. Crit.* **2018**, *31*, 22. [CrossRef]
30. Catania, C.G.; Petrucci, L.; Martinelli, V.; Politi, P.; Pellegrini, C.; Klersy, C.; Berwick, D.; Monteleone, S. Qualità di vita e disturbo ansioso-depressivo dopo trapianto cardiaco. Valutazione di due coorti di pazienti a breve e lunga distanza dall'intervento. *Boll. Soc. Med. Chir. Pavia* **2013**, *126*, 583–592.
31. Grady, K.L.; Lanuza, D.M. Physical Functional Outcomes After Cardiothoracic Transplantation. *J. Cardiovasc. Nurs.* **2005**, *20*, s43–s50. [CrossRef]
32. Karapolat, H.; Eyigor, S.; Durmaz, B.; Yagdi, T.; Nalbantgil, S.; Karakula, S. The relationship between depressive symptoms and anxiety and quality of life and functional capacity in heart transplant patients. *Clin. Res. Cardiol.* **2007**, *96*, 593–599. [CrossRef]

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