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Determining the Relationship Between Perceived Social Support and Fear of Death in Patients with Liver Transplantation: A Cross-Sectional Survey

Karaciğer Nakli Hastalarında Algılanan Sosyal Destek ile Ölüm Korkusu Arasındaki İlişkinin Belirlenmesi: Kesitsel Araştırma

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ABSTRACT Objective: This study was conducted to explore the relationship between perceived social support and death anxiety in patients with liver transplantation. **Material and Methods:** This is a cross-sectional and correlational study conducted with 140 liver transplant patients admitted to a liver transplant center of a university. Purposive sampling was employed for participant selection. The Personal Information Form, Multidimensional Scale of Perceived Social Support (MSPSS) and Death Anxiety Scale (DAS) were used in data collection. The data analysis was performed using IBM SPSS Statistics 25. **Results:** The mean DAS total score of the participants was 6.77±3.04, 26.4% had low, 53.6% had moderate and 20% had severe death anxiety. The mean MSPSS total score was 65.45±22.62, which indicates high perceived social support. An analysis of the relationship between the mean DAS and MSPSS scores of the participants showed no significant relationship between the total scale scores ($p>0.05$). A statistically significant difference was found between the mean DAS total score and gender, educational status and time since transplantation ($p<0.05$). Death anxiety was found to be higher in the participants who were female, had lower educational attainment, and were within the first ten days of transplantation. **Conclusion:** Severe levels of death anxiety were observed in the participants of our study. We believe that psychosocial care is important for patients to overcome death anxiety. For this reason, it is recommended that the effectiveness of psychosocial support programs, including spiritual support programs, be researched and implemented throughout the patient care process.

Keywords: Death; death anxiety; liver transplantation; perceived social support

ÖZET Amaç: Bu çalışma karaciğer transplantasyonu olan hastalarda algılanan sosyal destek ile ölüm kaygısı arasındaki ilişkinin belirlenmesi amacıyla yapılmıştır. **Gereç ve Yöntemler:** Bu çalışma bir üniversitenin karaciğer nakli merkezine yatırılan 140 karaciğer nakli hastasıyla gerçekleştirilmiş kesitsel ve korelasyonel bir çalışmadır. Katılımcıların seçimi için amaçlı örnekleme yöntemi kullanılmıştır. Verilerin toplanmasında Kişisel Bilgi Formu, Çok Boyutlu Algılanan Sosyal Destek Ölçeği [Multidimensional Scale of Perceived Social Support (MSPSS)] ve Ölüm Kaygısı Ölçeği (ÖKÖ) kullanılmıştır. Veri analizi IBM SPSS İstatistik 25 kullanılarak yapıldı. **Bulgular:** Katılımcıların ÖKÖ toplam puanı ortalaması 6,77±3,04 olup, %26,4'ü düşük, %53,6'sı orta ve %20'si şiddetli ölüm kaygısına sahiptir. Ortalama MSPSS toplam puanı 65,45±22,62 olup algılanan sosyal desteğin yüksek olduğunu göstermektedir. Katılımcıların ÖKÖ ortalamaları ile MSPSS puanları arasındaki ilişki incelendiğinde, toplam ölçek puanları arasında anlamlı bir ilişki olmadığı görüldü ($p>0,05$). Ortalama ÖKÖ toplam puanı ile cinsiyet, eğitim durumu ve nakilden bu yana geçen süre arasında istatistiksel olarak anlamlı fark bulundu ($p<0,05$). Kadın, eğitim düzeyi düşük ve nakil sonrası ilk 10 gün içinde olan katılımcılarda ölüm kaygısının daha yüksek olduğu belirlendi. **Sonuç:** Çalışmamıza katılanlarda ciddi düzeyde ölüm anksiyetesi gözlemlendi. Hastaların ölüm anksiyetesini yenebilmeleri için psikososyal bakımın önemli olduğuna inanıyoruz. Bu nedenle hasta bakım sürecine manevi destek programlarını da kapsayan psikososyal destek programlarının etkinliklerinin araştırılıp uygulanması önerilmektedir.

Anahtar Kelimeler: Ölüm; ölüm anksiyetesi; karaciğer nakli; algılanan sosyal destek

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Liver transplantation (LT) is considered the gold standard treatment for individuals with end-stage liver disease, providing prolonged survival and an improved quality of life.[1-3] However, strict protocols in organ transplantation lead to several complexities, including acute and chronic rejection, tumors, life-threatening infections, recurring organ dysfunction, and mortality.[4] Therefore, it is essential to initiate treatments immediately following any organ transplantation to promote ideal graft and patient longevity.[5] Immunosuppressive therapy involves drugs to help prevent immunologic rejection of grafts following LT.[6,7] Immunosuppressive therapy inhibits the host's immune system, preventing an excessive and harmful response to the foreign organ after transplantation, thereby facilitating the host's acceptance of the organ.[8] However, immunosuppressive therapy can lead to serious infections and increased morbidity and mortality rates as it suppresses the immune system.[9-11]

One of the challenges associated with both LT and the immunosuppressive regimen employed to forestall graft rejection post-transplantation is death.[4] A survey of existing literature indicates a paucity of research on the fear of mortality among liver transplant recipients.[11,12] Fear of mortality, coupled with feelings of powerlessness, engenders significant anxiety in patients.[13]

Both immunosuppressive therapy and postoperative complications are associated with increased postoperative anxiety and depression, prolonged wound healing, extended hospital stays, and reduced adherence to immunosuppressive therapy in patients.[14-17]

Social support provided after LT plays a crucial role in promoting recovery and facilitating the reintegration into social life.[18,19]

Patients experience social isolation due to immunosuppressive therapy, which makes it difficult for them to receive psychosocial and social-environmental support.[20] Studies have shown that high perceived social support is associated with reduced psychiatric symptoms and high quality of life in Human Immunodeficiency Virus-positive patients before and after stem cell transplantation, LT and kidney transplantation.[21-24] While there exists a restricted body of research in the literature concerning the fear of mortality among liver transplant recipients.[11,12] The existing literature includes several studies on the presence of death anxiety in the post-LT period; however, research comprehensively examining its relationship with social support remains limited. Additionally, it is well established that immunosuppressive therapy and potential complications following transplantation can lead to adverse clinical outcomes, such as anxiety, depression, prolonged hospital stays, and reduced treatment adherence. From a nursing perspective, addressing these psychosocial challenges is essential to promoting holistic patient well-being. While social support has been suggested as a potential protective factor in mitigating these negative effects, its role in post-transplant care remains insufficiently explored. This study aims to examine the relationship between social support levels and death anxiety in individuals who have undergone LT, providing valuable insights for enhancing patient care and developing psychosocial support strategies in clinical practice.

Study Hypotheses

H_0: Perceived social support has no effect on death anxiety in patients with LT.

H_1: Perceived social support has an effect on death anxiety in patients with LT.

MATERIAL AND METHODS

This study is descriptive and cross-sectional. The study aimed to investigate the correlation between perceived social support and fear of death among liver transplant recipients.

RESEARCH DESIGN AND PARTICIPANTS

The study involved liver transplant recipients admitted to the Liver Transplant Institute of a university hospital in Türkiye, subsequent to receiving approval from an ethics committee. The study population consisted of 140 patients who underwent LT between September 2022 and January 2023. Purposive sampling was employed for participant selection. All individuals who were accessible during the specified time frame were included in the study. In the "post hoc" power

analysis [G*Power 3.1.9.7 (Heinrich Heine University Düsseldorf; Düsseldorf, Germany)] performed on the study data, the effect size was 0.38, the alpha value was 0.05 and the minimum power of the study was 0.95. The data were gathered via in-person interviews. The researcher verbally presented the data gathering form to the participants, and their responses were transcribed and documented on the form.

Inclusion criteria

- Patients who have undergone a liver transplant;
- Age≥18;
- Able to communicate in Turkish;
- Participants should not have any severe, ongoing psychiatric conditions
- Participants do not have cognitive impairments;

Exclusion criteria

- Not speaking Turkish or having obstacles to communication.

DATA COLLECTION TOOLS

The research data were collected using the Demographic and Disease Characteristics Form, which includes participants' demographic characteristics, medical information, and questions related to LT, as well as the Multidimensional Scale of Perceived Social Support (MSPSS) and the Death Anxiety Scale (DAS).

Characteristic Information Questionnaire

The questionnaire consists of 13 items investigating medical diagnosis, age, marital status, educational level, gender, organ donor type, place of residence, employment status, presence of chronic illness, time elapsed since transplantation, history of surgery, immunosuppressive medication use, and associated drug side effects.[13]

The MSPSS

The MSPSS was created by Zimet et al., and its validation and reliability assessment for Türkiye were performed by Eker and Arkar.[25,26] The instrument comprises 12 items, divided into 3 sets of 4 items each, corresponding to different sources of support. The rating is made on a 7-point Likert-style scale ranging from 1 "Very Strongly Disagree" and 7 "Very Strongly Agree". The scale consists of 3 subscales including family (items 3, 4, 8 and 11), significant other (items 1, 2, 5 and 10) and friends (items 6, 7, 9 and 12). The subscale score is determined by adding the scores of the 4 items within each subscale, while the total score is obtained by summing all the subscale scores. A higher score signifies a greater level of perceived social support. The Cronbach's Alpha value of the scale was found to be 0.80-0.95.[26] In this study, the scale exhibited a Cronbach's Alpha coefficient of 0.94.

The DAS

The instrument was formulated by Templer et al. and employed to gauge the extent of mortality apprehension.[27] In the study, the Cronbach's Alpha value of the scale was found to be 0.70. The study investigating the validity and reliability of the Turkish translation of the scale by revising it for different groups in Turkish norms was conducted by Akça and Köse.[28] The instrument comprises 15 statements, which are evaluated using a binary Likert-style scale with options for "true" or "false". The total score, obtained by summing the points assigned to each statement, reflects the level of death anxiety experienced. A maximum score of 15 is achievable, with higher scores indicating greater death anxiety. Scoring between 0-4 points indicates a "low" level, 5-9 points suggests a "moderate" level, 10-14 points indicates a "severe" level of death anxiety, while 15 points denotes a state of "panic-level" death anxiety.[28]

ETHICS

Before the research, the ethical approvals were obtained from Turgut Özal Medical Center Liver Transplant Institute and Malatya Turgut Özal University Ethics Committee (date: July 1, 2022, no: 2022/119). Following participants' comprehension of the voluntary aspect of their responses, the study's objectives, and the utilization of its outcomes, their consent, in accordance with the principle of informed consent, was obtained verbally and through written affirmation. The patients participating in the study were informed that their personal information would not be disclosed to anyone else and the "principle of confidentiality" would be complied with. Data were

collected in the patient's hospital room under standard clinical conditions. This ensured patient comfort and minimised external influences. The research adhered to the guidelines outlined in the Helsinki Declaration.

STATISTICAL ANALYSIS

Following the coding of the data by the researchers, analysis was conducted utilizing IBM SPSS (IBM Corp., Armonk, NY) Statistics 22 (SPSS Authorization Code: 794f5c72bc41572d732f). Descriptive statistical methods were employed for data analysis. The Kruskal-Wallis test and Mann-Whitney U test were used to investigate the relationship between the scales and descriptive characteristics. Student t-test and one way analysis of variance were applied to the parametric data. Tukey test was used to reveal the group that caused the difference in the parameters that were found to be significant as a result of the analysis. The scale's reliability coefficient was assessed using Cronbach's Alpha. When interpreting the results, consideration was given to a 95% confidence interval and significance levels below 0.05.

RESULTS

72.1% of the participants were male, 60% were under 58 years of age, 87.9% were married, 39.3% were primary school graduates and 90.7% were unemployed (Table 1). Additionally, 77.1% had a family member as donor, 40% had another chronic disease, 34.3% had Hepatitis B Virus as the reason for transplantation, 52.1% had previous operations, and 59.3% experienced adverse effects due to the drugs used (Table 1).

The mean DAS total score of the participants was 6.77±3.04, the mean MSPSS family subscale score was 26.32±5.32, the mean MSPSS friends subscale score was 20.35±10.49, the mean MSPSS significant other subscale score was 18.77±10.32, and the mean MSPSS total score was 65.45±22.62 (Table 2). Low death anxiety was found in 26.4% of the participants, moderate in 53.6% and severe in 20% (Table 2).

About the relationship between the mean DAS and MSPSS scale and subscale scores of the partici-

TABLE 1: Participants' demographic and disease characteristics (n=140)

Variable	Category	n	%
Age	18-37 years	20	14.3
	38-57 years	64	45.7
	58-85 years	56	40
Gender	Female	39	27.9
	Male	101	72.1
Marital status	Married	123	87.9
	Single	17	12.1
Education	Illiterate+literate	19	13.6
	Primary school graduate	55	39.3
	Middle school	20	14.3
	High school graduate	27	19.3
	University and above	19	13.6
Residence area	Within the province	13	9.3
	Outside the city	127	90.7
Donor	Family	108	77.1
	Relative	21	15
	Foreign	8	5.7
	Cadaver	3	2.1
Employment	Yes	13	9.3
	No	127	90.7
Chronic illness	Yes	56	40
	No	84	60
Existing chronic diseases	DM	17	12.1
	HT	15	10.7
	Other	8	5.7
	DM and HT	16	11.4
Reason for transplant	HBV	48	34.3
	HCC	11	7.9
	Cryptogenic	37	26.4
	Ethanol	8	5.7
	Wilson	5	3.6
	Autoimmune	10	7.1
	HBV+HCC	8	5.7
	Toxic Hepatitis	3	2.1
	Other (Hemochromatosis-Fulminant Hepatitis-Hemangioma-Cirrhosis-Hydatid Cyst-Budd Chari Syndrome)	10	7.1
Time after transplant	1-10 day	21	15.0
	11-21 day	22	15.7
	22-32 day	7	5.0
	33 day or more	90	64.3
History of surgery	Yes	73	52.1
	No	67	47.9
Side effect of drugs	No	57	40.7
	Neuropsychiatric	17	12.1
	Infection	36	25.7
	Other (GIS, vision, sleep, renal problems)	30	21.5

DM: Diabetes mellitus; HT: Hypertension; HBV: Hepatitis B virus; HCC: Hepatocellular carcinoma; GIS: Gastrointestinal system

TABLE 2: Descriptive data for death anxiety, social support and scores

	$\bar{X}$	SD	Minimum	Maximum
MSPSS family support	26.3286	5.32463	4	28
MSPSS friend support	20.3571	10.49431	4	28
MSPSS significant other support	18.7714	10.32239	4	28
MSPSS total	65.4571	22.62213	12	84
DAS	6.77	3.04	0	14
DAS levels	n		%	
Mild	37		26.4	
Intermediate	75		53.6	
Heavy	28		20.0	
Total	140		100.0	

SD: Standard deviation; MSPSS: Multidimensional Scale of Perceived Social Support; DAS: Death Anxiety Scale

pants, no significant correlation was found between the mean DAS total score and the mean MSPSS subscale and total scores ($p>0.05$) (Table 3).

Regarding the relationship between the mean DAS and MSPSS scale and subscale scores of the participants, no significant relationship was found between the mean DAS total score and the mean MSPSS subscale and total scores ($p>0.05$) (Table 4).

The mean scale scores were compared in terms of the sociodemographic characteristics of the participants, and a statistically significant difference was found between the mean DAS total score and gender, educational status, and time since transplantation ($p<0.05$). Death anxiety was found to be higher in the participants who were female, had lower educational attainment, and were within the first ten days of transplantation. Perceived social support was found to be higher in participants who were 22-32 days post-transplantation (Table 4).

DISCUSSION

The correlation between perceived social support and fear of death in patients with LT was discussed in line with the relevant literature. Despite being challenging and complex, organ transplantation is generally the most effective single treatment option for end-stage organ failure.

In the United Kingdom, NHS Blood and Transplant documented 5,090 solid organ transplants solely in 2017, with kidneys, livers, lungs, and hearts being the most frequently transplanted organs. Given the expanding count of individuals on the active transplant roster, a global surge in solid organ transplants is anticipated.[29,30]

Khun et al. describe the situation of liver disease patients as a "dance with death". Patients face a terminal illness requiring continuous medical care and are in search of donors.[12] Surgical improvements after organ transplantation have revolutionized patient care; however, strict organ transplantation practices still cause a number of complications such as acute and chronic rejection, malignancies, life-threatening infection, recurrent organ failure and mortality.[4,30] Immunosuppressive therapy used to prevent immunologic rejection of the graft after transplantation can lead to inhibition of the immune system in the patient and increase the risk of death by exposure to different infectious agents.[8] In this study, it was de-

TABLE 3: Correlation between death anxiety and social support

		MSPSS family support	MSPSS friend support	MSPSS significant other support	MSPSS total
MSPSS family support	r value	1	0.389**	0.357**	0.579**
	p value		0.000	0.000	0.000
MSPSS friend support	r value	0.389**	1	0.849**	0.943**
	p value	0.000		0.000	0.000
MSPSS significant other support	r value	0.357**	0.849**	1	0.934**
	p value	0.000	0.000		0.000
DAS	r value	-0.129	0.072	0.030	0.077
	p value	0.129	0.401	0.724	0.364

**Dependent variables; MSPSS: Multidimensional Scale of Perceived Social Support; DAS: Death Anxiety Scale

TABLE 4: Distribution of patient characteristics according to death anxiety and multidimensional perceived social support level scores

Variable	Category	DAS X̄±SD	p value	MSPSS X̄±SD	p value
Age	18-37 years	6.55±3.73	p= 0.877	67.70±22.09	p=0.173
	38-57 years	6.90±2.87		68.64±22.55	
	58-85 years	6.69±3.00		61.01±22.54	
Sex	Female	8.46±2.95	**p<0.001**	62.28±25.22	p=0.304
	Male	6.11±1.91		66.68±21.54	
Marital Status	Married	6.76±3.04	p=0.940	65.71±22.60	p=0.495
	Single	6.82±3.14		63.58±23.34	
Education	Literate	9.00 ±3.19	**p=0.005**	68.68 ±23.85	p=0.785
	Primary school graduate	6.70±3.07		63.43±23.68	
	Middle school	6.45±2.30		64.85±22.56	
	High school graduate	5.62±3.02		64.37±23.06	
	University and above	6.68±2.60		70.26±18.52	
Residence area	Within the province	5.69±2.81	p=0.180	62.00±24.86	p=0.688
	Outside the city	6.88±3.05		65.81±22.45	
Donor	Family	6.69±3.03	p=0.775	65.85±23.45	p=0.929
	Relative	6.76±2.73		63.90±19.45	
	Foreign	7.87±3.87		67.75±22.83	
	Cadaver	6.66±4.16		56.00±18.33	
Employment	Yes	7.07±2.69	p=0.705	69.76±23.10	p=0.470
	No	6.74±3.08		65.01±22.61	
Chronic illness	Yes	6.51±2.83	p=0.423	65.50±22.54	p=0.985
	No	6.94±3.17		65.42±22.80	
Existing chronic diseases	DM	5.82±3.08	p=0.749	59.88±24.44	p=0.351
	HT	6.80±3.16		69.00±21.03	
	Other	7.00±2.26		75.00±16.66	
	DM+HT	6.75±2.59		63.43±24.15	
Reason for transplant	HBV	7.16±3.34	p=0.151	65.70±23.25	p=0.666
	HCC	5.72±2.24		67.90±26.09	
	Cryptogenic	7.29±2.96		67.40±19.07	
	Ethanol	4.37±3.33		58.62±27.36	
	Wilson	4.40±1.81		72.60±20.82	
	Autoimmune	7.10±2.16		69.70±20.90	
	HBV+HCC	6.75±3.28		69.37±16.55	
	Toxic Hepatitis	5.66±2.51		56.00±38.57	
	Other (Hemochromatosis-Fulminant Hepatitis-Hemangioma-Cirrhosis-Hydatid Cyst-Budd Chari Syndrome)	7.20±2.65		51.70±27.29	
Time after transplant	1-10 days	7.09±3.74	**p=0.003**	62.28±22.57	**p=0.044**
	11-21 days	4.77±2.42		69.45±19.17	
	22-32 days	5.57±2.37		84.00±0.00	
	33 days or more	7.27±2.85		63.77±23.70	
History of surgery	Yes	6.94±3.32	p=0.483	66.42±21.53	p=0.968
	No	6.58±2.70		64.40±23.86	
Side effect of drugs	Yes	7.00±3.03	p=0.285	64.80±23.98	p=0.962
	No	6.43±3.05		65.90±21.77	

*p<0.05; DAS: Death Anxiety Scale; MSPSS: Multidimensional Scale of Perceived Social Support; DM: Diabetes mellitus; HT: Hypertension; HBV: Hepatitis B virus; HCC: Hepatocellular carcinoma

termined that approximately 73.6% of the participants had moderate to severe levels of death anxiety based on their DAS total scores (Table 2). There are a limited number of studies investigating death anxiety in organ transplant recipients, and our findings are consistent with the existing literature.[11,12] Fear of death causes severe depression, anxiety and delayed wound healing in patients.[31] Spiritual care plays a crucial role in mitigating the fear of death experienced by patients, which can adversely affect disease progression. It is therefore recommended that transplant patients be included in spiritual support programmes and provided with psychosocial support to improve the quality of care they receive.

The mean MSPSS total score of the participants was high (Table 2). The highest score was obtained from the family subscale of the MSPSS scale. Since patients with LT are both in need of care and mentally exhausted, perceived social support is of great importance.[13] Post-transplant patients need an ideal level of perceived social support to adapt to immunosuppressive therapy.[32] Weak social support may lead to morbidity and mortality.[13] However, previous studies have reported low social support scores in heart and liver transplant patients.[13]

In our study, no significant relationship was found between the participants' mean DAS scores and MSPSS total or subscale scores (Table 3). A review of the literature revealed that perceived social support positively impacts post-traumatic growth, psychological resilience, self-care, physical health and resilience in transplant patients.[13,18] But not important correlation was found between perceived social support and death anxiety in the present study. It was found that the patients' perceived social support was high; however, their level of death anxiety was also high. One study in the literature found a significant association between death anxiety and depression in cancer patients and highlighted perceived social support as a protective factor.[33] Death anxiety is a very intense emotion and many different components are believed to play a role in coping. Strong social support alone is believed to be insufficient in coping with fear of death. Severe fear of death jeopardizes resilience and may cause patients to feel lonely, helpless, sad and abandoned. As a consequence, patients may display increased major depression, non-adherence to immunosuppressive drug therapy and suicidal conduct due to severe fear of death. Another study suggests that multicomponent interventions should be developed to effectively manage death anxiety.[34] In the study, death anxiety was found to be higher in the participants who were female, had lower educational attainment, and were within the first 10 days of transplantation ($p<0.05$). A study examining the impact of education on survival after heart transplantation found that patients with a high school education or higher demonstrated better medication adherence and follow-up, which positively influenced survival outcomes. Bülbüloğlu et al. discovered no association between gender and apprehension of death, whereas they reported that fear of death was higher in participants with lower educational attainment and within the first 21 days post-transplantation.[11,35]

LIMITATIONS

The findings of this current investigation are constrained to individuals who underwent LT at a solitary facility within a defined timeframe.

CONCLUSION

The findings of this study underscore the significant impact of death anxiety among liver transplant recipients, particularly in individuals with lower educational attainment, female patients, and those in the early postoperative period. Despite high levels of perceived social support, the absence of a significant correlation between perceived social support and death anxiety suggests that additional psychosocial interventions are necessary. Addressing death anxiety through comprehensive care approaches, including psychological counseling and spiritual support, may enhance patient outcomes and overall well-being. Based on these findings, it is recommended that multidisciplinary interventions be developed to address both medical and psychological challenges faced by liver transplant recipients. Healthcare providers should integrate psychological screening and support into post-transplant care to mitigate the adverse effects of death anxiety. Additionally, targeted educational programs may improve patient resilience,

medication adherence, and postoperative recovery. The establishment of structured support groups could also foster a sense of belonging and reduce feelings of isolation experienced by patients. Furthermore, given that the highest levels of perceived social support were reported from family members, it is essential to involve families in patient care actively. Training family caregivers on psychological coping mechanisms and stress management strategies may further enhance their ability to provide meaningful support. Future research should explore alternative coping strategies and examine the long-term effects of psychological interventions on transplant recipients' mental health and quality of life. By integrating these recommendations, a holistic care model can be established to optimize both physical and psychological well-being in liver transplant patients.

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Conflict of Interest

No conflicts of interest between the authors and / or family members of the scientific and medical committee members or members of the potential conflicts of interest, counseling, expertise, working conditions, share holding and similar situations in any firm.

Authorship Contributions

Idea/Concept: *Kübra Kayaoğlu;* ***Design:*** *Kübra Kayaoğlu;* ***Control/Supervision:*** *Kübra Kayaoğlu;* ***Data Collection and/or Processing:*** *Hatice Çakır;* ***Analysis and/or Interpretation:*** *Kübra Kayaoğlu, Hatice Çakır;* ***Literature Review:*** *Kübra Kayaoğlu, Hatice Çakır;* ***Writing the Article:*** *Kübra Kayaoğlu;* ***Critical Review:*** *Kübra Kayaoğlu;* ***References and Fundings:*** *Kübra Kayaoğlu, Hatice Çakır;* ***Materials:*** *Kübra Kayaoğlu, Hatice Çakır.*

REFERENCES

1. Dąbrowska-Bender M, Kozaczuk A, Pączek L, Milkiewicz P, Słoniewski R, Staniszewska A. Patient quality of life after liver transplantation in terms of emotional problems and the impact of sociodemographic factors. Transplant Proc. 2018;50(7):2031-8. [Crossref] [PubMed]
2. Martín-Rodríguez A, Pérez-San-Gregorio MA, Domínguez-Cabello E, Fernández-Jiménez E, Bernardos-Rodríguez Á. Funcionamiento biopsicosocial entre pacientes cirróticos en distintas etapas del proceso de trasplante y su comparación con trasplantados hepáticos. Anales De Psicología. 2013;30(1):83-92. [Crossref]
3. O'Carroll RE, Turner F, Flatley K, McGregor LM, Hayes PC. Functional outcome following liver transplantation - a pilot study. Psychol Health Med. 2008;13(2):239-48. [Crossref] [PubMed]
4. Sen A, Callisen H, Libricz S, Patel B. Complications of solid organ transplantation: cardiovascular, neurologic, renal, and gastrointestinal. Crit Care Clin. 2019;35(1):169-86. [Crossref] [PubMed]
5. Hampson FA, Freeman SJ, Ertner J, Drage M, Butler A, Watson CJ, et al. Pancreatic transplantation: surgical technique, normal radiological appearances and complications. Insights Imaging. 2010;1(5-6):339-47. [Crossref] [PubMed] [PMC]
6. Rodríguez-Perálvarez M, De la Mata M, Burroughs AK. Liver transplantation: immunosuppression and oncology. Curr Opin Organ Transplant. 2014;19(3):253-60. [Crossref] [PubMed] [PMC]
7. Moini M, Schilsky ML, Tichy EM. Review on immunosuppression in liver transplantation. World J Hepatol. 2015;7(10):1355-68. [Crossref] [PubMed] [PMC]
8. Dougan C, Ormerod I. A neurologist's approach to the immunosuppressed patient. J Neurol Neurosurg Psychiatry. 2004;75 Suppl 1(Suppl 1):i43-9. [Crossref] [PubMed] [PMC]
9. Kinnunen S, Karhapää P, Juutilainen A, Finne P, Helanterä I. Secular trends in infection-related mortality after kidney transplantation. Clin J Am Soc Nephrol. 2018;13(5):755-62. [Crossref] [PubMed] [PMC]
10. Geissler EK. Post-transplantation malignancies: here today, gone tomorrow? Nat Rev Clin Oncol. 2015;12(12):705-17. [Crossref] [PubMed]
11. Bulbuloglu S, Kapikiran G. The effect of immunosuppressive therapy after liver transplantation on activities of daily living and fear of death during the COVID-19 pandemic. Transpl Immunol. 2021;69:101470. [Crossref] [PubMed] [PMC]
12. Testoni I, Milo V, Ronconi L, Feltrin A, Zamperini A, Rodelli M, et al. Courage and representations of death in patients who are waiting for a liver transplantation. Cogent Psychology. 2017;4(1):1294333. [Crossref]
13. Bülbüloğlu S, Demir B. The effect of perceived social support on psychological resilience in liver transplant patients receiving immunosuppression therapy. Transpl Immunol. 2021;69:101475. [Crossref] [PubMed]
14. Zieger M, Schwarz R, König HH, Härter M, Riedel-Heller SG. Depression and anxiety in patients undergoing herniated disc surgery: relevant but underresearched - a systematic review. Cent Eur Neurosurg. 2010;71(1):26-34. [Crossref] [PubMed]
15. Christian LM, Graham JE, Padgett DA, Glaser R, Kiecolt-Glaser JK. Stress and wound healing. Neuroimmunomodulation. 2006;13(5-6):337-46. [Crossref] [PubMed] [PMC]
16. Stirling L, Raab G, Alder EM, Robertson F. Randomized trial of essential oils to reduce perioperative patient anxiety: feasibility study. J Adv Nurs. 2007;60(5):494-501. [Crossref] [PubMed]
17. Morales JM, Varo E, Lázaro P. Immunosuppressant treatment adherence, barriers to adherence and quality of life in renal and liver transplant recipients in Spain. Clin Transplant. 2012;26(2):369-76. [Crossref] [PubMed]

18. Yıldız E, Demir B, Sarıtaş S. Perceived social support associated with post-traumatic growth in liver transplant recipients: a cross-sectional study. Transpl Immunol. 2022;72:101562. [Crossref] [PubMed]
19. Maldonado JR. Why it is important to consider social support when assessing organ transplant candidates? Am J Bioeth. 2019;19(11):1-8. [Crossref] [PubMed]
20. Burra P, Ferrarese A, Feltrin G. Quality of life and adherence in liver transplant recipients. Minerva Gastroenterol Dietol. 2018;64(2):180-6. [Crossref] [PubMed]
21. Helgeson VS. Social support and quality of life. Qual Life Res. 2003;12 Suppl 1:25-31. [PubMed]
22. Lim JW, Zebrack B. Social networks and quality of life for long-term survivors of leukemia and lymphoma. Support Care Cancer. 2006;14(2):185-92. [Crossref] [PubMed]
23. Smith SK, Crespi CM, Petersen L, Zimmerman S, Ganz PA. The impact of cancer and quality of life for post‐treatment non‐Hodgkin lymphoma survivors. Psycho‐Oncology. 2010;19(12):1259-67. [Crossref]
24. Ordin YS, Karayurt Ö. Effects of a support group intervention on physical, psychological, and social adaptation of liver transplant recipients. Experimental and Clinical Transplantation. 2016;14(3): 329-37. [Crossref]
25. Zimet GD, Dahlem NW, Zimet SG, Farley GK. The multidimensional scale of perceived social support. Journal of Personality Assessment. 1988;52(1):30-41. [Crossref]
26. Eker D, Arkar H. Factorial structure, validity, and reliability of revised form of the multidimensional scale of perceived social support. Turkish Journal of Psychiatry. 2001;12(1):17-25. [Link]
27. Templer DI. The construction and validation of a Death Anxiety Scale. J Gen Psychol. 1970;82(2d Half):165-77. [Crossref] [PubMed]
28. Akça F, Köse İA. Ölüm kaygısı ölçeğinin uyarlanması: geçerlik ve güvenirlik çalışması [Adaptation of Death Anxiety Scale (DAS): Validity and Reliability Studies]. Klinik Psikiyatri Dergisi. 2008;11(1):7-16. [Link]
29. Mahillo B, Carmona M, Alvarez M, Marco J, Nuñez JR, López-Fraga M, et al. Worldwide distribution of solid organ transplantation and access of population to those practices. Transplantation. 2018;102:71-2. [Crossref]
30. Cajanding R. Immunosuppression following organ transplantation. Part 1: mechanisms and immunosuppressive agents. British Journal of Nursing. 2018;27(16):920-7. [Crossref]
31. Goldenberg JL. A body of terror: denial of death and the creaturely body. In: Shaver PR, Mikulincer M, eds. Meaning, Mortality, and Choice: The Social Psychology of Existential Concerns. Washington DC: American Psychological Association; 2012. p. 93-110. [Crossref]
32. Cajanding R. Immunosuppression following organ transplantation. Part 2: complications and their management. British Journal of Nursing. 2018;27(18):1059-65. [Crossref]
33. Shahzadi K, Mazhar S. Death anxiety and depression among cancer patients: role of perceived social support. Journal of Professional&Applied Psychology. 2024;5(1):68-81. [Crossref]
34. Huang Y, Guan Z, Yan F, Wiley JA, Reynolds NR, Tang S, et al. Mediator role of presence of meaning and self-esteem in the relationship of social support and death anxiety. Front Psychol. 2022;13:1018097. [Crossref] [PubMed] [PMC]
35. Zaver S, Ravi Y, Copeland LA, Zaver H, Raines TI, Emani S, et al. Education and its impact on post-heart transplant survival? The Journal of Heart and Lung Transplantation. 2022;41(4):S246. [Link]