

Original Article

The effect of general health on the psychological well-being of post-operative liver transplantation patients receiving immunosuppressants

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Abstract

Objectives: This study aims to examine the effect of general health status on the psychological well-being of liver transplant recipients receiving immunosuppressive therapy.

Methods: This descriptive and cross-sectional study was carried out with the participation of 116 liver transplant recipients at the organ transplant institute of a research and practice hospital. We used personal information form, general health questionnaire-12 (GHQ-12), and psychological well-being (PWB) scale to collect data and performed the data analysis using statistical packed for the social sciences 25.0 by IBM.

Results: Of the participants, 50% were women and between the ages of 51–64 and 52.6% had less income than their expenses; 75.9% of the recipients had a chronic disease, 33.6% had diabetes mellitus, and 25.9% had coronary artery disease. The GHQ-12 total score was high for psychiatric disorders, while the PWB scale score was moderate. There was a statistically significant, positive, and strong relationship between general health and PWB ($p < 0.05$, $r = 0.022$).

Conclusion: General health and PWB are two important factors that mutually affect each other. Recognizing the poor psychological state of liver transplant patients and improving their general health contributes to a good postoperative period. During the post-operative period, liver recipients should be carefully monitored, and their psychological state should be improved.

Keywords: General health; immunosuppressants; liver transplantation; psychological well-being; recipients.

If end-stage, liver failure and dysfunction cannot be treated with any medical method, an indication of transplantation surgery is inevitable.^[1-3] In general, the number of liver transplantation centers in the world and in Türkiye is increasing day by day, and post-operative survival has reached rates that can be considered ideal.^[4] During the 2-year period after liver transplantation, when immunosuppressive therapy continues, patients need more help financially, socially, and

spiritually. An increase in quality of life and comfort, as well as compliance with immunosuppressive and other treatment protocols, can be achieved primarily through financial convenience and comfort. Because, transplant patients need better care and rest, lots of rest. Unfortunately, the burdens of social status and insufficient financial means often prevent this. Poverty and low socioeconomic status have been associated with poor health outcomes in the literature. People

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living in poverty are at risk for cardiovascular disease,^[5] diabetes-related complications,^[6] and a higher prevalence of cancer and cancer-related mortality.^[7] Moreover, the average life expectancy of poor people is 7 years shorter than people of good socioeconomic status.^[8]

Common complications due to immunosuppressive treatments after transplantation surgery are neuropsychiatric, renal, endocrine disorders, blood and heart problems, gastrointestinal problems, edema, malignancy, infection, neurotoxicity, and nephrotoxicity. In addition, the prevalence of diabetes, hypertension, coronary artery disease, goiter, and chronic kidney disease after liver transplantation is quite high in the literature.^[9-11] Good care, nutrition, exercise, and psychological health are essential in combating these side effects and comorbid diseases. Financial problems significantly weaken psychological well-being (PWB).^[12]

There are many factors that negatively affect psychological well-being. Although there are no studies in which these are detailed, it is noted that PWB improves the clinical outcomes of liver recipients.^[13] In a study, it was determined that the side effects of immunosuppressive drugs weakened psychological resilience in patients who had undergone liver transplantation.^[11] Low PWB has been associated with mortality risk, longer hospital stays, and lower survival rates.^[14] Liver transplant recipients are at risk for psychiatric problems from the onset of organ failure to post-operative recovery, and it is very important that psychiatric nurses participate in the treatment and care process in all these stages.

Materials and Method

This study was conducted to investigate the general health and PWB of patients who received post-liver transplantation immunosuppression therapy.

Type of Research

The research conducted is a descriptive and cross-sectional study.

Research Questions

1. What is the general health status of liver transplant recipients receiving immunosuppressive therapy?
2. What is the PWB of liver transplant recipients receiving immunosuppressive therapy?
3. What is the relationship between the general health status and PWB of liver transplant recipients receiving immunosuppressive therapy?

Research Design and Participants

We carried out this research at the organ transplantation unit of a research and practice hospital in Eastern Türkiye in November 2021. The calculation was the at least sample size based on $\alpha=0.05$ error margin, 0.95 power, was found as 94. The research sample consists of 116 patients who underwent liver transplantation and received immunosuppressive

What is presently known on this subject?

- Studies examining the general health status between psychological well-being of liver transplantation in recipients are limited.

What does this article add to the existing knowledge?

- Immunosuppressive drugs play a primary role in graft viability. Immunosuppressives can cause side effects that impair general health. Impaired general health can also impair psychological well-being.

What are the implications for practice?

- The importance of immunosuppressive therapy in the viability of the transplanted organ is obvious. Most importantly, psychological and emotional needs should be taken into account as well as physical needs and supportive care should be provided.

therapy. Data collection was done at a transplant hospital by the researchers. The inclusion and exclusion criteria are listed below.

Inclusion and Exclusion Criteria

Inclusion criteria included (i) To have a liver transplant, (ii) to be over 18 and receiving immunosuppressive therapy, (iii) to have no speech, communication, or language problems, and (iv) to agree to participate in the study. The exact opposite of the inclusion criteria the exclusion criteria.

Data Collection Method and Tools

General health questionnaire (GHQ)-12, PWB scale, and a personal information form, which was prepared with assistance from experts, were used in data collection. Further information about data collection tools is presented below.

Personal Information Form

It is a questionnaire in which demographics such as age, gender, marital status, work unit, and work experience in years were questioned. In addition to questions about personal characteristics, questions about transplantation surgery and immunosuppressive treatments were included in the study.

GHQ-12

The GHQ-12 is a self-administered scale that questions the mental symptoms of the past week, aiming to reveal mental disorders that may be present in the public and in participants in clinical settings other than psychiatry. It was developed by David Goldberg^[15] in 1972. It was translated into Turkish, and its validity and reliability study was performed by Kiliç (1996).^[16] Kiliç calculated the validity reliability as 0.74 and the specificity as 0.84. In this study, Cronbach's alpha reliability coefficient was found to be 0.84. There are 12 questions in GHQ-12. Each question has four options and questions symptoms over the past few weeks. The options are never (a), always (b), often (c), and very often (d). In the present study, 0-0-1-1 GHQ type scoring was used. Among the answers given to the survey questions, 0 points were assigned to options a and b, and 1 point to options c and d, and participants could get points between 0 and 12. Those who scored "2 and above" in the study were accepted as risky in terms of mental problems according to the GHQ-12 results. In the questionnaire, it is accepted that mental health worsens,

and the probability of psychiatric disorders increases with the increasing score. Values obtained by GHQ-type scoring indicate risk groups. Scores received over the 12 items are grouped as low, medium, and high. Those who score <2 on the scale are classified as low-risk, those with 2–3 points as medium-risk, and those with 4 or more points as high-risk for psychiatric problems.

PWB Scale

The PWB Scale was developed by Diener et al.^[17] as a seven-point Likert-type scale. It was adapted to Turkish by Telef.^[18] The score range is 8–56. A high total score from the scale indicates that the individual is psychologically resourceful and powerful. Its internal consistency is 0.80.^[18] In this study, the internal consistency coefficient was calculated as 0.87.

Statistical Analysis

SPSS v.25.0 was used to evaluate the data. Before starting the analysis, it was found using the Kolmogorov–Smirnov test that the data was not normally distributed. Frequency, %, mean, and standard deviation were used for data calculation. For group comparisons, t-test and one-way ANOVA were used for independent samples, and complementary post hoc analysis was used to determine differences. The results were evaluated at a 95% confidence interval, at the $p < 0.05$ significance level.

Ethics of the Research

Before the research, necessary legal and ethical permissions were obtained from the Ethics Committee of İnönü University Faculty of Medicine (Ethics Committee Decision No: 2021/2600) and the chief physician of Turgut Özal Research and Application Hospital. In line with the declaration of Helsinki, participants who underwent liver transplantation were handed a volunteer information form by the researcher to inform them about the study. Patients who volunteered to participate in the study (recipients) were included in the study after their informed consent was obtained.

Findings

Table 1 represents the demographics and mean GHQ-12 and PWB scores of the liver recipients.

According to Table 1 of the liver recipients participating in the study, 50% are women and between the ages of 51 and 64, 94% are married, 52.6% have less income than their expenses, and 30.2% are high school graduates; 75.9% of the recipients had a chronic disease, 33.6% had diabetes mellitus, and 25.9% had coronary artery disease. 50% of the recipients were determined to have received immunosuppressive drug treatment between 181 days and 1 year. When we examined the most commonly used immunosuppressants, we found that 82.7% used mycophenolate mofetil, 80.17% corticosteroid, 62.1% azathioprine, and 55.18% used tacrolimus. It was determined that the age group with the lowest PWB was between the ages of 18 and 35 ($p = 0.004$), and general

health was at high risk in all age groups. General health and PWB did not change according to gender, marital status, or educational status. PWB and general health in comorbid chronic diseases did not change according to the type of chronic disease, but the general health status of those with chronic diseases was at higher risk and their PWB was weaker than those without any chronic diseases ($p < 0.05$). General health was determined to worsen when the duration of immunosuppressive treatment was prolonged. PWB was found to be lowest in those receiving treatment between 181 days and 1 year, and highest in those receiving treatment for more than 1 year. There was no statistically significant difference between the immunosuppressive agent and PWB and general health (Table 1).

GHQ-12 and PWB scores of liver transplant recipients are shown in Table 2. When the mean GHQ-12 and PWB scores were examined, it was found that the total GHQ-12 score was 10.03 ± 2.01 (a score of 4 and above indicates high-level psychiatric disorder), and the PWB score was 31.17 ± 7.63 (intermediate).

Table 3 presents the correlation between GHQ-12 and PWB. Accordingly, there is a statistically significant, positive, and strong relationship between general health and PWB ($p < 0.05$, $r = 0.022$).

Figure 1 shows the relationship between GHQ-12 and PWB. Here, it can be seen that the general health of individuals with moderate and low PWB is also impaired.

Discussion

The main purpose of transplantation surgery is to prevent mortality in advanced-stage organ failure and to offer a higher-quality life to the recipient. There is evidence in the literature that quality and longevity of life are not only affected by physiological but also psychological/psychiatric parameters.^[19,20] A significant relationship was found between PWB and longevity.^[21] Therefore, it is very important to develop strategies for measuring and raising PWB. It has been stated that satisfaction from life and having positive emotions reduce mortality, increase general health, and lead to a longer life span.^[22] It is inevitable for several parameters such as the burdens of surgery and post-care and treatment after liver transplantation, social inadequacies, and financial problems to affect PWB. There are no studies in optimal number or quality that investigate the PWB of liver recipients. In this regard, academicians working in the field of psychiatric nursing have important roles and responsibilities.

In our study, the PWB of all recipients was at high risk and their general health was not in good condition, regardless of their sociodemographic background, the type of immunosuppressive drug they used, and the comorbid chronic disease. Furthermore, recipients between the ages of 18 and 35 had the lowest PWB compared to other age groups. In the literature, PWB was found to be moderate after liver transplantations.^[11,23] In this

Table 1. Demographics and mean GHQ-12 and PWB scores of the liver recipients (n=116)

Descriptive statistics	n	%	GHQ-12	PWB
Age (years)				
18–35 (1)	13	11.2	10.76±1.92	25.61±5.57
36–50 (2)	20	17.2	10.70±2.22	30.95±6.67
51–64 (3)	58	50	10.39±2.03	33.72±7.57
65 and over (4)	25	21.6	10.16±1.90	31.39±7.87
Test and value			KW=1.855, p=0.395	KW=11.294, p=0.004**
<i>Post hoc</i>				3>4>2>1
Gender				
Female	58	50	30.70±7.60	10.24±1.90
Male	58	50	31.63±7.69	10.63±2.11
Test and value			U=1.477, p=0.242	U=1.513, p=0.352
Marital status				
Single	7	6	10.14±1.95	27±7.63
Married	109	94	10.45±2.02	31.44±7.58
Test and value			U=368.50, p=0.876	U=276.50, p=0.223
Income level				
Income less than expenses	61	52.6	11.02±2.13	31.11±6.79
Income equal to expenses	52	44.8	10.34±1.61	33.16±5.71
Income more than expenses	3	2.6	10.11±2.12	32.51±4.56
Test and value			KW=0.327, p=0.030*	KW=2.351, p=0.212
Education level				
Primary school	27	23.3	10.44±2.02	30.48±7.31
Middle school	28	24.1	10.46±2.23	34.10±8.47
High school	35	30.2	10.37±2.15	29.97±6.78
Bachelor's degree and above	26	22.4	10.50±1.63	30.34±7.68
Test and value			KW=0.143, p=0.705	KW=3.323, p=0.068
Presence of a chronic disease				
No	28	24.1	10.85±2.35	29.28±7.48
Yes	88	75.9	11.30±1.88	31.77±7.62
Test and value			U=1.101, p=0.032*	U=1.000, p=0.013*
Chronic disease(s) *				
GI problems	28	24.1	10.85±2.35	29.28±7.48
Diabetes mellitus	39	33.6	10.38±2.14	31.25±7.97
Hypertension			10.13±1.47	32.56±7.74
Coronary artery disease	30	25.9	9.88±0.92	34.55±7.56
Goiter	9	7.8	11.40±3.13	27.60±3.33
Kidney problems	5	4.3	10.40±2.07	30.20±7.01
Test and value			KW=0.294, p=0.99	KW=3.544, p=0.471
Past surgical experience				
Yes	21	18.1	10.23±1.94	31.52±6.96
No	95	81.9	10.48±2.03	31.09±7.80
Test and value			U=9.165, p=0.548	U=9.875, p=0.943
Duration of immunosuppressants usage				
Less than a month (1)	20	17.2	10.15±1.76	31.94±8.25
1–6 months (2)	28	24.1	10.42±2.13	30.53±6.81
181 days to 1 year (3)	58	50	10.95±2.11	28.65±6.81
More than 1 year (4)	10	8.6	11.10±2.72	33.50±7.04
Test and value			KW=1.994, p=0.014*	KW=3.952, p=0.027*
<i>Post hoc</i>			4>3>2>1	4>1>2>3
Immunosuppressive drugs used				
Proliferation inhibitor	6	5.2	10.16±1.90	32.72±7.57
Mycophenolate mofetil	96	82.7	10.24±2.11	30.16±8.13
Tacrolimus	64	55.18	10.51±2.08	31.86±7.04
Azathioprine	72	62.1	10.02±1.65	29.65±6.99
Calcineurin Inhibitors	38	32.8	11.16±2.48	29.50±8.58
Corticosteroid	93	80.17	11.14±2	28.51±7.55
Test and value			KW=3.096, p=0.213	KW=2.694, p=0.260

*Patient may belong to more than 1 option; KW: Kruskal Wallis test, U: Mann Whitney U test, *p<0.05; **p<0.01, GHQ: General health questionnaire, PWB: Psychological wellbeing.

Table 2. Mean GHQ-12 and PWB scores (n=116)

Overall scale and sub-scales	Items	Number of items	Score range	Min., Max.	X \pm SD
GHQ-12 ^a	1–12	12	0–12	8, 12	10.03 \pm 2.01
PWB ^b	1–8	8	8–56	17, 48	31.17 \pm 7.63

^aScore <2, low levels of psychiatric disorder; Score=2–3, medium levels of psychiatric disorder; Score >2, high levels of psychiatric disorder; ^bPsychological well-being increases with score; GHQ: General health questionnaire; PWB: Psychological wellbeing, SD: Standard deviation.

Table 3. Correlation analysis between GHQ-12 and PWB (n=116)

Correlations	Psychological well-being
Spearman's rho	
General Health	
Correlation coefficient	0.022
Sig. (2-tailed)	0.017*
N	116

*p<0.05; GHQ: General health questionnaire; PWB: Psychological wellbeing.

study, recipients with chronic disease constituted 75.9% of the sample group and had worse general health and poorer PWB than the others. Research results supporting the data we obtained in our study are available in the literature.^[11,13,24]

One of the most striking results of our study is the finding that general health worsens as the duration of immunosuppressive treatment is prolonged. Another important result is that PWB is lowest in those receiving treatment between 181 days and 1 year, and highest in those receiving treatment for more than 1 year. This may be associated with reduced immunosuppressive therapy after 1 year, or it may sometimes be associated with a decrease in the patient's compliance with immunosuppressive therapy. A high rate of depression was found in liver recipients after transplantation.^[25]

Immunosuppressive treatment practices are the basis of the problems that threaten PWB after liver transplantation. In this context, it is a known fact that the use of immunosuppressive drugs can result in central nervous system toxicity.^[26] The

prevalence of neurotoxicity in organ transplantation can vary considerably depending on the immunosuppressive agent used. On the other hand, corticosteroids and calcineurin inhibitors have been associated with higher levels of central nervous system problems.^[14] However, no statistically significant difference was found between the immunosuppressive agent used in our current study and PWB and general health. This may be the result of the frequently changing treatment protocol.

Although the negative effects of immunosuppressive drug use are known, drug therapies that can replace immunosuppressants have not been developed yet. Effective immunosuppression plays a key role in organ viability after transplantation. Effective immunosuppressive therapy depends on good management of its complications. In our study, impairment of PWB and poor general health were determined to be possible problems after liver transplantation.

Limitations

We cannot generalize the results obtained in the study to the general population. Our study is single-center. Because it was a self-evaluation study, patients may have expressed it differently than they did. The patients were not evaluated individually in terms of psychopathology objectively. The aforementioned issues were accepted as the limitations of the study.

Conclusion

The burdens of the surgery and treatment protocol after liver transplantation may endanger the general health and PWB of the recipients, and many unexpected problems may cause disturbances in the physiological state. Post-operative care and treatment of liver transplant recipients should be carefully monitored to avoid iatrogenic effects. In addition to surgical nurses, psychiatric nurses should also take part in the perioperative process of liver transplant recipients. In the post-operative period, the patients should be allowed to express themselves to plan interventions to elevate PWB and general health. Non-drug interventions that support mental health, relaxing activities, and social organizations can be arranged, and emotional and financial support can be provided. Side effects of immunosuppressive agents should be detected early and managed well. The findings of our study will add value to the care to be offered to liver recipients and will be a guide when planning health care.

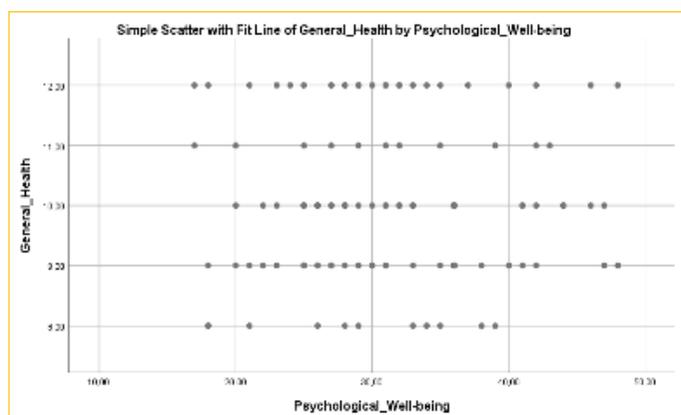


Figure 1. Relationship between GHQ-12 and PWB (n=116).

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