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Prevalence of Depression, Anxiety, Stress, and Quality of Life among Individuals with Hemodialysis

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ABSTRACT

Hemodialysis was filtering the blood of a person whose kidneys were not working normally. **Objective:** To investigate the prevalence of depression, anxiety, stress, and quality of life among individuals with hemodialysis. **Methods:** A total of 134 patients were taken from the hospitals of Lahore. The participant's age ranges were between 20-60 years. A purposive sampling technique was used to collect the data. The following measures were used to assess the findings i.e., Demographic, Depression Anxiety Stress Scale (DASS), and World Health Organization Quality of Life Brief (WHOQOL). **Results:** The analyses revealed that the high prevalence of depression, anxiety, and stress in hemodialysis patients and significantly poor quality of life in hemodialysis patients. **Conclusions:** It was concluded that hemodialysis, the most common treatment for end stage renal disease, was a risk factor for psychological illnesses such as depression and anxiety. So, there was a need to develop a treatment strategy, including therapeutic invitations that eventually, improve quality of life.

INTRODUCTION

A patient with CKD has the following complications such as elevated blood pressure, anemia (low blood count), brittle bones, inadequate nourishment, and nerve damage could occur in the patient. Moreover, heart and blood vessel diseases are more likely to develop in those with kidney illness [1]. Diabetes, high blood pressure, and other conditions can lead to chronic kidney disease. In this disease, the kidneys lose their capacity to filter and eliminate waste and excess fluid from the body as a result of acute kidney injury and chronic kidney disease (also known as acute renal failure) [2]. Hemodialysis is a phrase that means filtering the blood. It accomplishes this by circulating a few ounces of blood through a filter to remove waste materials and excess fluid [3]. Psychosocial concerns are an understudied but significant concern in the overall health of hemodialysis patients. Stress is a byproduct of chronic illness and its treatment, and it can have significant effects on psychological and physical results [4]. Depression is the most common psychological complication that has a significant impact on the quality of life of patients and their careers, negatively affecting their social, economic, and psychological well-being [5]. Extreme nervousness and anxiety [6]. Renal failure patients may have somatic symptoms such as shortness of breath, palpitations, chest pain, sweating, and fear of death. Many times, these symptoms are unrelated to any stimuli and can arise suddenly. However, there are numerous reasons why anxiety may emerge. The dialysis process, as well as a slew of potential medical consequences, cause the patient to be concerned and

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anxious [7]. Depression has an important role in the evolution of chronic medical conditions. People suffering from depression lose hope and give up on life. Depression is the most significant and prevalent psychological condition among ESRD patients [8]. Depression in dialysis patients has an impact not only on mortality but also on hospitalization rates and dialysis withdrawal [9]. On the other hand, anxiety is also widespread in hemodialysis patients, with a 27% incidence among 70 urban HD patients, slightly higher than the 18% reported in a nationwide survey [10]. Health-related Quality of Life (QOL) is an important assessment of how a condition impacts patients' life. Physical, psychological, and social functioning, as well as overall life satisfaction, are among the dimensions of quality of life [11]. Depression is closely associated with lower health-related QOL, particularly in mental dimensions. Furthermore, multiple studies have found that individuals with inferior QOL had a higher prevalence of worry and weariness, as well as increased mortality over time [12].

Hence, the current study aimed to explore the prevalence of depression, anxiety, stress, and quality of life among individuals with hemodialysis

METHODS

In this research, a cross-sectional study was chosen to explore the prevalence of depression, anxiety, stress, and quality of life among individuals with hemodialysis. The sample size was calculated using G-Power software with effect size = 0.35, using α=0.05, and power = 0.90 (https://www.highyieldmed.org/sample-size-calculation-2/) structured sample of 129 and 134 participants were taken in this study. A purposive sampling technique was used to collect the data from hospitals in Lahore through a purposive sampling technique from September 2023 to March 2024. The inclusion criteria involved only adults aged 20-60 years who have been diagnosed with ESRD and were receiving regular hemodialysis treatment and had been on this treatment for a minimum duration, such as three months, to ensure stability and adaptation. Patients were taken from only the middle-class income group. Patients with medical and psychiatric comorbidity, and physical and intellectual disability were excluded. Patients with mild, moderate, and severe rage were taken but extremely severe cases were excluded. Personal Demographic sheet, personal information form comprised items related to the participant's name (optional), age, education, working/non-working, marital status, family structure, range of total family income, and duration of dialysis and comorbidities. The Depression Anxiety Stress Scale was developed by Lovibond PF and Lovibond SH in 1995 [13]. It consists of 42 items and has three subscales, depression, anxiety, and stress. Each subscale was based on 14 items. The questionnaire was a 4-point ranting scale. Response categories range from 0 does not apply at all, to 3 applies very strongly and all items were positively worded. Scoring categories for depression, 28+, for anxiety 20+ for stress 34+ were extremely severe. WHO's WHOQOL-BREF questionnaire (1997) was used to assess QOL in ESRD patients. The improved and clinically appropriate variant was designated WHOQOL-BREF. It has organized into four domains: physical, psychological, social relationships, and environment. The reliability ranged from .67 to .86 for all the domains of the instrument. A translation of WHOQOL-BREF in Urdu was carried out which established that it was a reliable (α = 0.86) and valid version for the Pakistani population. It consisted of 26 items which were scored on a 5-point scale that ranged from extremely satisfied to extremely dissatisfy [5, 1]. The study protocol was first submitted to the Ethical Research Committee (ERC) for review. After that, it received clearance from the Board of Studies (BOS). Finally, on 18-9-2023, the Institutional Review Board (IBR) (Reference Number: IHT/ADM/30) granted its final approval. The researcher provided a concise explanation to the participants regarding the study's objective. After taking informed consent, participants were requested to carefully review and sign it to indicate their willingness to participate in the study. It was guaranteed that the information you received would be kept confidential, and you would have the right to withdraw from the study at any time if you experienced any discomfort. All statistical computations were calculated by using Statistical Package for the Social Sciences (SPSS) version 27.0. Qualitative variables were presented with mean ± SD and qualitative variables were presented with frequency and percentage. One Way ANOVA was applied to see the WHO quality of life score in relation to anxiety depression and stress status of patients. Multiple comparison test Tukey (HSD) was applied to see the difference of WHO-QOL score in relation to anxiety, Depression and Stress status. P-value ± 0.05 was considered statistically significant

RESULTS

Table 1 shows that the sample included 13.4% of individuals in the age range 18 to 28 years, 14.2% 29 to 38 years, 22.4% 39 to 49 years, 50.0% of participants were age range 50 and above years 9.0% in participants were illiterate, 29.1% participants were under matric education level, 32.8% participants were matriculation, 17.2% participants had intermediate education level, 6.7% participants were bachelor and 5.2% did M.A and above of the participants, 82.8% were married, 11.9% were single, and 5.2% were widowed. Regarding family structure, 30.6% of the patients belonged to joint families, while 69.4% were part of nuclear families. Among the participants, 11.9% were employed, 32.1% were unemployed, 49.3% were housewives, 5.2% were retired, and 1.5% were students.

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Participants had monthly income in a range of 15,000 to 30,000 18.7%, and 56.0% had a range of 30,000 to 45,000. A total of 31.3% of participants had been undergoing dialysis for 6 months to 1 year, 17.2% had been on dialysis for 2 to 3 years, and 51.5% had been on dialysis for more than 3 years. Additionally, 32.1% of participants had diabetes as a comorbidity, 51.1% had hypertension, and 22.4% were affected by hepatitis B or C.

Table 1: Frequency and Percentage of Demographic Sample

Variables	N (%)
Gender	
Male	71 (53.0%)
Female	63 (47.0%)
Age	
20-30	18 (13.4%)
30-40	19 (14.2%)
40-50	30 (22.4%)
50-60	67 (50.0%)
Marital Status	
Married	16 (11.9%)
Unmarried	111 (82.8%)
Widow	7 (5.2%)
Education Level	
Illiterate	12 (9.0%)
Under Matric	39 (29.1%)
Matriculation	44 (32.8%)
Intermediate	23 (17.2%)
Bachelor	9 (6.7%)
MA and Above	7 (5.2%)
Family System	
Joint	41 (30.6%)
Nuclear	93 (69.4%)
Total Income	Total Income
15,000-30,000	25 (18.7%)
30,000-45,000	75 (56.0%)
45,000 and Above	34 (25.4%)
Employment Status	
Employed	16 (11.9%)
Unemployment	43 (32.1%)
Housewives	66 (49.3%)
Retired	7 (5.2%)
Student	2 (1.5%)
Average Year of Hemodialysis	
6 Months - 1 Year	42 (31.3%)
2 Years - 3 Years	23 (17.2%)
3 Years and Above	69 (51.5%)
Comorbidities	
Diabetes	43 (32.1%)
Hypertension	69 (51.5%)
Hypothesis B/C	30 (22.4%)

Note: f=frequency and %=Percentage

Table 2 showed that the greatest proportion of patients experience extreme severity in depression (35.8%) and severe stress (35.1%), with mean scores of 72.15 and 74.28, respectively. Anxiety was most widespread in the moderate group (35.1%), with an average score of 73.38. The table demonstrates the tremendous psychological burden in this patient population, with a high proportion of patients in the severe and extremely severe categories for all three illnesses.

Table 2: Frequency Distribution Mild to Extreme Severity of Depression, Anxiety and Stress among Patients with Hemodialysis

Variables	Categories	Mean ± SD	N (%)
Depression	Mild	88.722 ± 7.969	18 (13.4%)
	Mod	75.625 ± 9.640	24 (17.9%)
	Severe	70.545 ± 8.638	44 (32.8%)
	Extremely Severe	72.145 ± 7.682	48 (35.8%)
Anxiety	Mild	69.694 ± 15.036	36 (26.9%)
	Mod	73.383 ± 8.208	47 (35.1%)
	Severe	76.920 ± 4.725	25 (18.7%)
	Extremely Severe	80.692 ± 3.121	26 (19.4%)
Stress	Mild	68.400 ± 5.253	10 (7.5%)
	Mod	67.475 ± 6.332	40 (29.9%)
	Severe	74.276 ± 7.216	47 (35.1%)
	Extremely Severe	83.918 ± 10.523	37 (27.6%)

Table 3 displayed the mean and standard deviation of scores across the four dimensions of the World Health Organization Quality of Life BREF (WHOQOL), which were provided on a 4-20 and 0-100 scale. The Environmental domain has the greatest average score of 13.57 (60.06 on the 0-100 scale), while the Physical domain has the lowest average of 11.4 (44.68 on the 0-100 range). The Psychological and Social domains were in the middle, indicating differing levels of reported quality of life in many parts of patient's lives.

Table 3: Mean and Standard Deviation of Scores on World Health Organization Quality of Life BREF (WHOQOL)

Categories	Transformed (4-20) Mean ± SD	Transformed (0-100) Mean ± SD
Physical	11.4 ± 2.508	44.68 ± 15.499
Psychological	12.66 ± 2.152	54.21 ± 13.428
Social	12.49 ± 3.188	53.01 ± 19.963
Environmental	13.57 ± 2.140	60.06 ± 13.372

Note: Mean ± SD = Standard Deviation

Table 4 showed the findings of a one-way ANOVA comparing Quality of Life (QOL) across patients with varied degrees of depression, anxiety, and stress. There were significant variations across all three variables. Patients with mild depression had the highest mean QOL (M = 88.72), whereas those with severe and extremely severe depression had considerably lower QOL ratings (M = 70.55 and M = 72.15, respectively), with a f value of 21.78 and P =0.001. For anxiety, QOL dropped as severity rose, from light (M = 69.69) to extremely severe (M = 80.69), with substantial variation (f = 7.47, P <0.001). Stress had the greatest influence, with QOL scores ranging from 68.40 in

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mild situations to 83.92 in really severe cases, as indicated by a f value.

Table 4: One-Way ANOVA on the variable of Quality of Life with Mild to Extreme Severity of Depression, Anxiety and Stress among Patients with Hemodialysis

Grade	N	Mean ± SD	SE	95% CI		F	p-Value
				Lower Bound	Upper Bound		
Depression							
Mild	18	88.722 ± 7.969	1.878	84.759	92.685	21.78	0.001
Moderate	24	75.625 ± 9.640	1.967	71.554	79.695		
Severe	44	70.545 ± 8.638	1.302	67.919	73.171		
Extreme	48	72.145 ± 7.682	1.108	69.915	74.376		
Anxiety							
Mild	36	69.694 ± 15.036	2.506	64.606	74.782	7.47	0.001
Moderate	47	73.383 ± 8.208	1.197	70.973	75.792		
Severe	25	76.920 ± 4.725	0.945	74.969	78.870		
Extreme	26	80.692 ± 3.121	0.612	79.431	81.953		
Stress							
Mild	10	68.400 ± 5.253	1.661	64.641	72.158	29.77	0.001
Moderate	40	67.475 ± 6.332	1.001	65.449	69.500		
Severe	47	74.276 ± 7.216	1.052	72.157	76.395		
Extreme	37	83.918 ± 10.523	1.730	80.410	87.427		

Table 5 showed the findings of a Tukey-HSD post-hoc analysis that compared the quality of life (QOL) scores of patients with varying degrees of depression, anxiety, and stress. For depression, mild instances had considerably higher QOL scores than moderate, severe, and extremely severe cases ($P < 0.001$). However, there were no statistically significant differences between moderate, severe, or extremely severe instances. In terms of anxiety, light cases had significantly higher QOL scores than severe and extremely severe cases, while moderate cases had greater QOL than extremely severe cases, demonstrating a constant reduction in QOL as anxiety intensity increased. There were considerable changes in stress between mild and extremely severe.

Table 5: Tuckey-HSD Comparison Among Mild to Extreme Severity of Depression, Anxiety, And Stress On the Variable of Quality of Life Among Patients with Hemodialysis

(I) > (J)	Mean Difference (I-J)	SE	95% Confidence Interval		p-Value
			Lower Bound	Upper Bound	
Depression					
Mild > Moderate	13.097*	2.623	6.270	0.000	19.923
Mild > Severe	18.176*	2.353	12.051	0.000	24.302
Mild > Extreme	16.576*	2.325	10.525	0.000	22.627
Moderate > Severe	5.079	2.134	-0.476	0.086	10.635
Moderate > Extreme	3.479	2.103	-1.994	0.352	8.952
Severe > Extreme	-1.600	1.755	-6.169	0.799	2.969
Anxiety					
Mild > Moderate	-3.688	2.109	-9.178	0.303	1.801
Mild > Severe	-7.225*	2.479	-13.678	0.022	-0.772
Mild > Extreme	-10.997*	2.451	-17.377	0.000	-4.618
Moderate > Severe	-3.537	2.357	-9.672	0.440	2.598
Moderate > Extreme	-7.309*	2.327	-13.367	0.011	-1.251
Severe > Extreme	-3.772	2.667	-10.715	0.493	3.170
Stress					
Mild > Moderate	0.925	2.807	-6.380	0.988	8.230
Mild > Severe	-5.876	2.764	-13.072	0.151	1.3193
Mild > Extreme	-15.518*	2.829	-22.883	0.000	-8.154
Moderate > Severe	-6.801*	1.707	-11.246	0.001	-2.356
Moderate > Extreme	-16.443*	1.810	-21.157	0.000	-11.730
Severe > Extreme	-9.642*	1.744	-14.183	0.000	-5.101

DISCUSSION

The finding of the present research showed a high Prevalence of depression, anxiety, and stress in hemodialysis patients. In the present study, 42.5% were severe levels of depression. 26.5% of patients were found in extremely severe levels of depression 67.2% of patients had extremely severe levels of anxiety.18.7% of patients were found in severe levels of anxiety. 48.5% of patients reported severe levels of stress. 32.1%patients reported moderate levels of stress. Additionally, another study showed a prevalence incidence of 26.6% for depression and 45% for anxiety was found in individuals who were diagnosed with ESRD [14, 15]. On the other hand, the study found that the prevalence rate for anxiety was 45.7% and the prevalence rate for depression was 29% among patients with ESRD [16]. These findings highlight the significant burden of mental health concerns that persons who were having therapy for ESRD confront. Increased levels of psychological distress may be a result of the difficulties that were involved with the management of a chronic illness such as ESRD, which necessitates continuing medical interventions such as transplantation or dialysis [17]. This patient population may be more susceptible to developing melancholy and anxiety or experiencing an exacerbation of these conditions, due to many factors, including the impact of symptoms, changes in lifestyle, financial strain, and uncertainty about the future [18]. Additionally, the present study also indicates that patients with poor quality of life will have high levels of depression and anxiety. The ANOVA analysis supports this hypothesis, showing significant associations between depression and three out of the four domains of quality of life: physical health, psychological well-being, and the environment. Patients experiencing poor physical health often report feelings of helplessness and despair, which were core components of depression. Similarly, poor psychological well-being, characterized by negative emotions and cognitive dysfunction, is inherently linked to depressive symptoms. These findings were consistent with numerous studies that have documented the reciprocal relationship between poor quality of life and depression. For instance, Feijão and Freitas investigated depression in 150 hemodialysis patients and stated that non-adherence to medicine could be a possible explanation for high levels of depression, stress, and

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anxiety in hemodialysis patients [19]. However, the researchers found that adherence or non-adherence to the treatment regimen did not significantly correspond to quality of life across the two groups [20]. According to numerous studies, people confronted with challenges or coping with chronic conditions frequently experience a decline in their mental well-being. Some of the factors that might lead to feelings of sadness, stress, and anxiety include the burden of managing physical health conditions, living with pain or discomfort, and navigating complex healthcare systems [21]. Additionally, the influence that these disorders have on day-to-day functioning, social relationships, and general life satisfaction further exacerbates the effects of psychological discomfort [22]. An early diagnosis of depression in patients who were waiting for a kidney transplant, according to, may contribute to an increase in the quality of life of those patients[23].

CONCLUSIONS

Hemodialysis, the most common treatment for end-stage renal disease, was a risk factor for psychological illnesses such as depression, stress, anxiety, and poor QOL. There was a need to develop a treatment strategy, including therapeutic invitations that eventually, improve quality of life.

Authors Contribution

Conceptualization: ASH
Methodology: AU
Formal analysis: AU
Writing, review and editing: MS

All authors have read and agreed to the published version of the manuscript.

Conflicts of Interest

The authors declare no conflict of interest.

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REFERENCES

[1] Zhou Y and Yang J. Chronic kidney disease: Overview. Chronic kidney Disease: Diagnosis and Treatment. 2020 Jan; 3-12. doi: 10.1007/978-981-32-9131-7_1.

[2] Chen TK, Sperati CJ, Thavarajah S, Grams ME. Reducing kidney function decline in patients with CKD: core curriculum 2021. American Journal of Kidney Diseases. 2021 Jun; 77(6): 969-83. doi: 10.1053/j.ajkd.2020.12.022.

[3] Yan Z, Wang G, Shi X. Advances in the progression and prognosis biomarkers of chronic kidney disease. Frontiers in Pharmacology. 2021 Dec; 12: 785375. doi: 10.3389/fphar.2021.785375.

[4] Nagy E, Tharwat S, Elsayed AM, Shabaka SA, Nassar MK. Anxiety and depression in maintenance hemodialysis patients: prevalence and their effects on health-related quality of life. International Urology and Nephrology. 2023 Nov; 55(11): 2905-14. doi: 10.1007/s11255-023-03556-7.

[5] Shahzadi M and Mahmood K. Level of Depression, Criminogenic Cognition, Relapse Risk, and Quality of Life among Patients with Substance Use Disorders: Level of Depression, Criminogenic Cognition and QoL. Pakistan Journal of Health Sciences. 2023 Sep: 112-8. doi: 10.54393/pjhs.v4i09.1030.

[6] Rich KL, Johnson RJ, Cousino MK. Psychosocial Adjustment and Adherence to Prescribed Medical Care of Children and Adolescents On Dialysis. Pediatric Dialysis. 2021: 665-79. doi: 10.1007/978-3-030-66861-7_35.

[7] Mushtaque I, Awais-E-Yazdan M, Zahra R, Anas M. Quality of life and illness acceptance among end-stage renal disease (ESRD) patients on hemodialysis: The Moderating Effect of Death Anxiety During COVID-19 Pandemic. OMEGA-Journal of Death and Dying. 2024 Jun; 89(2): 567-86. doi:10.1177/00302228221075202.

[8] Jain N and Hedayati SS. Depression and Other Psychological Issues in CKD. InManagement of Chronic Kidney Disease: A Clinician's Guide. 2023 Nov; 367-380. doi: 10.1007/978-3-031-42045-0_25.

[9] Roy B, Akter MK, Anowar MN, Rehana J. Depression among chronic kidney disease patients at a tertiary level hospital in Bangladesh. Journal of Psychiatry and Psychiatric Disorders. 2021; 5(2): 31-40. doi: 10.26502/jppd.2572-519X0130.

[10] Meng Y, Wu HT, Niu JL, Zhang Y, Qin H, Huang LL et al. Prevalence of depression and anxiety and their predictors among patients undergoing maintenance hemodialysis in Northern China: a cross-sectional study. Renal Failure. 2022 Dec; 44(1): 933-44. doi: 10.1080/0886022X.2022.2077761.

[11] Butt MD, Ong SC, Butt FZ, Sajjad A, Rasool MF, Imran I *et al.* Assessment of health-related quality of life, medication adherence, and prevalence of depression in kidney failure patients. International Journal of Environmental Research and Public Health. 2022 Nov; 19(22): 15266. doi: 10.3390/ijerph192215266.

[12] Etxeberria I, Urdaneta E, Galdona N. Factors associated with health-related quality of life (HRQoL): differential patterns depending on age. Quality of Life Research. 2019 Aug; 28(8): 2221-31. doi: 10.1007/s11136-019-02182-0.

[13] Lovibond SH and Lovibond PF. Manual for the depression anxiety stress scales. Sydney: Psychology Foundation. 1995. doi: 10.1037/t01004-

DOI: https://doi.org/10.54393/pjhs.v5i08.1856

000.
[14] Whoqol Group. Development of the World Health Organization WHOQOL-BREF quality of life assessment. Psychological Medicine. 1998 May; 28(3): 551-8. doi: 10.1017/S0033291798006667.
[15] Kamel RA, Fouad M, Goda TM. Anxiety and depression among hemodialysis patients in Egypt. Zagazig University Medical Journal. 2022 May; 28(3): 594-604. doi: 10.21608/zumj.2021.98028.2361.
[16] Bopaeda MM. Prevalence of Anxiety and Depression in Kidney Failure Patients Undergoing Hemodialysis. Journal of Medical and Health Studies. 2022 Jan; 3(1): 77-94. doi: 10.32996/jmhs.2022.3.4.6.
[17] Crowe K, Quinn TJ, Mark PB, Findlay MD. "Is It Removed During Dialysis?"-Cognitive Dysfunction in Advanced Kidney Failure-A Review Article. Frontiers in Neurology. 2021 Dec; 12: 787370. doi: 10.3389/fneur .2021.787370.
[18] Neumann D, Lamprecht J, Robinski M, Mau W, Girndt M. Social relationships and their impact on health-related outcomes in peritoneal versus haemodialysis patients: a prospective cohort study. Nephrology Dialysis Transplantation. 2018 Jul; 33(7): 1235-44. doi: 10.1093/ndt/gfx361.
[19] Cardoso da Cunha A, dos Santos-Neto ET, Martins CA, Salaroli LB. Leisure practices of individuals on hemodialysis and the social determinants of health. Journal of Human Behavior in the Social Environment. 2023 Nov: 1-1. doi: 10.1080/10911359.2023.2281968.
[20] Cardol CK, Meuleman Y, van Middendorp H, van der Boog PJ, Hilbrands LB, Navis G *et al.* Psychological distress and self-management in CKD: a cross-sectional study. Kidney Medicine. 2023 Oct; 5(10): 100712. doi: 10.1016/j.xkme.2023.100712.
[21] Van Wilder L, Pype P, Mertens F, Rammant E, Clays E, Devleesschauwer B *et al.* Living with a chronic disease: insights from patients with a low socioeconomic status. BMC Family Practice. 2021 Dec; 22: 1-1. doi: 10.1186/s12875-021-01578-7.
[22] Picardi A, Lega I, Tarsitani L, Caredda M, Matteucci G, Zerella MP *et al.* A randomised controlled trial of the effectiveness of a program for early detection and treatment of depression in primary care. Journal of Affective Disorders. 2016 Jul; 198: 96-101. doi: 10.1016/j.jad.2016.03.025.
[23] Akman B, Uyar M, Afsar B, Sezer S, Nurhan Ozdemir F *et al.* Adherence, depression and quality of life in patients on a renal transplantation waiting list. Transplant International. 2007 Aug; 20(8): 682-7. doi: 10.1111/j.1432-2277.2007.00495.x.