

Original Article

Physical and mental health survey of hemodialysis patients with infectious diseases: a single-center study

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Abstract: Objective: To assess the quality of life (QOL) and mental health of hemodialysis (HD) patients with infectious diseases, to analyze the related factors, and to provide evidence for improving the QOL of these patients and guiding the direction of clinical intervention. Methods: This case-control study investigated 107 HD patients (57 with and 50 without infectious diseases) using questionnaires, including the Brief Version of World Health Organization Quality of Life (WHOQOL-BREF), Kidney Disease Quality of Life, self-rating depression scale (SDS), self-rating anxiety scale (SAS), and social support rating scale (SSRS). The data were analyzed using independent t-test, analysis of variance, chi-square test, and multiple linear regression analysis. Results: The differences in general characteristics between HD patients with and without infectious diseases were not significant. The differences in age, dialysis time, education level, and marital status were significant among HD patients with different infectious diseases. The AIDS/HIV HD patients had lower scores in the fields of psychology, social relations, and the environment in the WHOQOL-BREF and in the psychological field of the KDQOL-36 compared with the other two subgroups ($P < 0.05$). The utilization of support score in SSRS was lower in HD patients with AIDS/HIV than in those with syphilis ($P < 0.05$). Multiple linear regression analysis demonstrated a decrease in the WHOQOL-BREF scores in the AIDS/HIV subgroup compared with the noninfectious, hepatitis, and syphilis subgroups. Conclusion: Compared with HD patients without infectious diseases, HD patients with infectious diseases (including hepatitis B/C virus, syphilis, and AIDS/HIV), especially those with AIDS/HIV, had a lower QOL, more serious negative emotions (depression and anxiety), and a greater difficulty in obtaining social support.

Keywords: Hemodialysis, infectious disease, quality of life, social support rating scale

Introduction

Hemodialysis (HD) is an important method to treat patients with end-stage renal disease. In recent years, with the continuous improvements in modern blood purification technologies and prolonged survival of HD patients, the number of HD patients is increasing. Moreover, the number of HD patients with infectious diseases [hepatitis B/C virus, syphilis, and acquired immunodeficiency syndrome/human immunodeficiency virus (AIDS/HIV)] has been increasing year after year. Previous studies have shown that a poor quality of life (QOL), anxiety, depression, and other negative emotions were more prominent in HD patients compared with healthy individuals [1-5]. However, HD patients with infectious diseases are a spe-

cial group of patients who suffer more pressure from their family and society than do HD patients without infectious diseases. The question is whether this pressure would affect the treatment efficacy and QOL of HD patients. Studies on QOL, mental health, and treatment effects in HD patients with infectious diseases are reported rarely, and the conclusions drawn from only a few papers are inconsistent. According to Turkish researchers, HD patients with hepatitis B viral infection showed a poorer QOL and more prominent negative mood, such as depression, compared with HD patients without infectious diseases [6]. However, Iranian scholars concluded that the QOL of HD patients with hepatitis virus infection (including hepatitis B and C) was higher compared with HD patients without infectious diseases [7]. A

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study on QOL and emotion in HD patients with syphilis and HIV has not been reported. According to clinical observations, this study hypothesized that HD patients with infectious diseases had a poorer QOL and more prominent negative emotions, such as anxiety and depression, compared with HD patients without infectious diseases. In this study, a questionnaire survey approach was used to collect and compare data from 107 HD patients (57 with infectious diseases and 50 without infectious diseases) from the Blood Purification Center of the Sixth People's Hospital in the Xinjiang Autonomous Region. The QOL and mental health of these HD patients were assessed, and the possible relevant factors were analyzed. This provides reliable scientific evidence to further improve the QOL of these patients and to guide the direction of clinical intervention.

Materials and methods

Subjects

Data from 107 HD patients were collected from the Blood Purification Center of the Sixth People's Hospital in the Xinjiang Autonomous Region and included in this case-control study, including 57 patients with infectious diseases (23 cases of hepatitis B/C virus, 23 cases of syphilis, and 11 cases of AIDS/HIV) and 50 patients without infectious diseases. The inclusion criteria were as follows: age ≥ 18 years, HD time ≥ 3 months, and a willingness to participate in the survey. The exclusion criteria were as follows: HD time < 3 months or unwillingness to participate in the survey. All patients involved in this study were informed of the survey regimen, and this survey was approved by the hospital ethics committee. The survey was performed in the Blood Purification Center of the Sixth People's Hospital in the Xinjiang Autonomous Region from March 20, 2015 to April 20, 2015.

Survey method

The study method was by questionnaire, which was explained in unified interpreted languages by the investigator (the HD specialist), and the patients were instructed to complete the questionnaire. A total of 107 questionnaires were distributed, and all were returned, giving an effective response rate of 100%.

Questionnaire

World health organization quality of life-brief version (WHOQOL-BREF) [8]: The scale comprises 26 items. The scale included four factors covering the fields of physiology, psychology, social relations and the environment; the higher the score the better the QOL in a particular field. The internal consistency reliability (Cronbach's α) of the scale was 0.775 in this survey.

Kidney disease quality of life (KDQOL-36) [9]: The scale comprises 36 items, including burden, symptoms, influence of kidney diseases, and the fields of physiology and psychology. Higher scores in the first three fields indicated less influence of kidney diseases on the patients (burden, symptoms and influence), while higher scores in the last two fields indicated a better QOL in different fields. The internal consistency reliability (Cronbach's α) of the scale was 0.850 in this survey.

Self-rating depression scale (SDS) [10]: The scale comprises 20 items (including 10 reverse score items), which represent 20 symptoms; the lower the score, the better the mental state. The internal consistency reliability (Cronbach's α) was 0.778 in this survey.

Self-rating anxiety scale (SAS) [11]: The scale comprises 20 items (including five reverse score items), which represent 20 symptoms; the lower the score, the better the mental state. The internal consistency reliability (Cronbach's α) was 0.781 in this survey.

Social support rating scale (SSRS) [12]: The scale comprises 10 items, which are divided into three dimensions: objective support (3 items), subjective support (4 items), and utilization of social support (3 items). The internal consistency reliability (Cronbach's α) was 0.779 in this survey.

Statistical analyses

SPSS 17.0 software (IBM, Armonk, NY, USA) was used for data entry and statistical analysis. The measurement data were presented as means \pm standard deviation. For numerical variables, the independent sample t-test was used to compare differences between two groups, and analysis of variance was used to

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Table 1. General information of HD patients with and without infectious diseases

Item	HD patients without infectious diseases (n = 50)	HD patients with infectious diseases (n = 57)	P values
Age (year)	52.5 ± 14.1	49.9 ± 14.7	0.352
Sex			0.091
Male	32 (64.0%)	45 (80.0%)	
Female	18 (36.0%)	12 (20.0%)	
Primary disease			0.661
Chronic glomerulonephritis	23 (46.0%)	21 (36.8%)	
Hypertension	16 (32.0%)	23 (40.4%)	
Diabetes	7 (14.0%)	10 (17.5%)	
Others	4 (8.0%)	3 (5.3%)	
Hemodialysis time (year)	4.8 ± 3.5	2.9 ± 2.9	0.453
< 3 years (number of cases)	15 (30.0%)	24 (42.1%)	0.192
≥ 3 and < 5 years (number of cases)	16 (32.0%)	9 (15.8%)	
≥ 5 and < 10 (number of cases)	13 (26.0%)	19 (33.3%)	
≥ 10 years (number of cases)	6 (12.0%)	5 (8.8%)	
Education level			0.221
Primary education and below	27 (54.0%)	33 (58.0%)	
High school/Technical secondary school	17 (34.0%)	12 (21.0%)	
University and above	6 (12.0%)	12 (21.0%)	
Marital status			0.932
Unmarried	8 (16.0%)	8 (14.0%)	
Married	31 (62.0%)	35 (61.4%)	
Divorced/Separated/Widowed	11 (22.0%)	14 (24.6%)	
Occupation			0.102
Workers/Farmers	35 (70.0%)	29 (50.9%)	
Administrative Personnel/Intellectuals	11 (22.0%)	23 (40.4%)	
Others/Unemployed	4 (8.0%)	5 (8.7%)	

compare differences among multiple groups. The chi-square test was used for categorical variables. The multivariate linear regression analysis was performed using sex, age, and infectious disease groups (noninfectious diseases, hepatitis B/C virus, syphilis and HIV/AIDS) as the independent variables (X) and the score of psychological scale as the dependent variable (Y). Statistical significance was set a priori at 0.05.

Results

General information of the subjects

The differences in age, sex, primary disease, dialysis time, education level, marital status, and occupation between HD patients with and without infectious diseases showed no significance ($P > 0.05$) (**Table 1**).

When comparing HD patients with different infectious diseases (**Table 2**), the differences in

sex, primary disease, and occupation showed no significance ($P > 0.05$).

HD patients with syphilis were older ($P < 0.05$), and had significantly lower educational levels ($P < 0.05$) compared with those with hepatitis and AIDS/HIV. However, the dialysis time of HD patients with hepatitis was longer than that of the other two subgroups ($P < 0.05$). There was a significant difference in marital status among the three subgroups ($P < 0.05$).

WHOQOL-BREF score of HD patients with and without infectious diseases

The differences in the WHOQOL-BREF scores between HD patients with and without infectious diseases were not significant (**Table 3**).

Among the three subgroups with infectious diseases, the scores of HD patients with AIDS/HIV were lower than those of the other two subgroups in the fields of psychology, social rela-

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Table 2. General information of HD patients with different infectious diseases

Item	Hepatitis B/C virus (n = 23)	Syphilis (n = 23)	AIDS/HIV (n = 11)	Inter-group P values	Inner-group P values		
					*	†	‡
Age (year)	47.3 ± 11.9	56.5 ± 14.5*†	41.4 ± 15.4‡	0.008	0.03	0.004	0.004
Sex				0.800			
Male	18 (78.3%)	19 (82.6%)	8 (72.7%)				
Female	5 (21.7%)	4 (17.4%)	3 (27.3%)				
Primary disease				0.780			
Chronic glomerulonephritis	10 (43.5%)	6 (26.1%)	5 (45.5%)				
Hypertension	9 (39.1%)	11 (47.8%)	3 (27.3%)				
Diabetes	3 (13.0%)	5 (21.7%)	2 (18.2%)				
Others	1 (4.3%)	1 (4.3%)	1 (9.1%)				
Hemodialysis time (year)	6.4 ± 3.4	3.0 ± 2.4*	2.5 ± 2.1*	< 0.001	< 0.001		
< 3 years (number of cases)	3 (13.0%)	13 (56.5%)	8 (72.7%)	0.013			
≥ 3 and < 5 years (number of cases)	4 (17.4%)	3 (13.0%)	2 (18.2%)				
≥ 5 and < 10 (number of cases)	11 (47.8%)	7 (30.4%)	1 (9.1%)				
≥ 10 years (number of cases)	5 (21.7%)	0 (0.0%)	0 (0.0%)				
Education level				0.001			
Primary education and below	9 (39.1%)	20 (87.0%)	4 (36.4%)				
High school/Technical secondary school	6 (26.1%)	3 (13.0%)	3 (27.3%)				
University and above	8 (34.8%)	0	4 (36.4%)				
Marital status				0.040			
Unmarried	3 (13.0%)	1 (4.3%)	4 (36.4%)				
Married	14 (60.9%)	18 (78.3%)	3 (27.3%)				
Divorced/Separated/Widowed	6 (26.1%)	4 (17.4%)	4 (36.4%)				
Occupation				0.231			
Workers/Farmers	12 (52.2%)	11 (47.8%)	6 (54.5%)				
Administrative Personnel/Intellectuals	8 (34.8%)	12 (52.2%)	3 (27.3%)				
Others/Unemployed	3 (13.0%)	0 (0.0%)	2 (18.2%)				

*Versus hepatitis B/C virus subgroup. †Versus AIDS/HIV subgroup. ‡Versus syphilis subgroup.

Table 3. Comparison of WHOQOL-BREF scores between HD patients with and without infectious diseases

Item	Physiological field	Psychological field	Social relations field	Environmental field
HD patients without infectious diseases (n = 50)	11.4 ± 2.7	12.3 ± 2.5	12.4 ± 2.2	12.2 ± 1.8
HD patients with infectious diseases (n = 57)	11.2 ± 2.4	11.6 ± 2.4	12.1 ± 2.9	12.0 ± 2.0
P values	0.606	0.257	0.598	0.558

tions, and the environment ($P < 0.05$) but did not differ from those in the physiological field. These results suggested that despite suffering from an infectious disease, the QOL of HD patients with AIDS/HIV was significantly lower than that of HD patients with hepatitis and syphilis (**Table 4**).

KDQOL-36 score of HD patients with and without infectious diseases

The differences in the KDQOL-36 score between HD patients with and without infectious diseases were not significant ($P > 0.05$) (**Table 5**).

The difference in the score in terms of the symptoms and effects of kidney diseases and the physiological field was not significant among the three subgroups of HD patients with infectious diseases ($P > 0.05$); however, the score in the psychological field was lower in HD patients with AIDS/HIV compared with the other two subgroups ($P < 0.05$). These findings indicated that despite suffering from an infectious disease, QOL was still significantly lower in HD patients with AIDS/HIV than in those with hepatitis and syphilis, especially in the psychological field; HD patients with AIDS/HIV had more problems (**Table 6**).

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Table 4. Comparison of WHOQOL-BREF scores among HD patients with different infectious diseases

Item	Physiological field	Psychological field	Social relations field	Environmental field
Hepatitis B/C virus (n = 23)	11.6 ± 2.2	12.5 ± 2.1*	13.0 ± 2.8*	12.4 ± 1.8*
Syphilis (n = 23)	11.2 ± 2.5	12.0 ± 1.4*	12.4 ± 2.7*	12.3 ± 1.9*
AIDS/HIV (n = 11)	10.0 ± 2.3	9.7 ± 2.4 ^{†‡}	9.7 ± 2.2 ^{†‡}	10.4 ± 1.7 ^{†‡}
F values	1.706	8.330	6.024	5.276
Inter-group P values	0.191	0.001	0.004	0.008
Inner-group P values	*	In hepatitis B/C virus subgroup, P < 0.001; in syphilis subgroup, P = 0.002	In hepatitis B/C virus subgroup, P = 0.001; in syphilis subgroup, P = 0.008	In hepatitis B/C virus subgroup, P = 0.004 in syphilis subgroup, P = 0.005
	†	< 0.001	0.001	0.004
	‡	0.002	0.008	0.005

*Versus AIDS/HIV subgroup. [†]Versus hepatitis B/C virus subgroup. [‡]Versus syphilis subgroup.

Table 5. Comparison of the KDQOL-36 score between HD patients with and without infectious diseases

Item	HD patients without infectious disease (n = 50)	HD patients with infectious disease (n = 57)	P values
Symptoms of kidney disease	72.96 ± 18.27	68.60 ± 19.95	0.532
Influence of kidney disease	58.50 ± 27.45	54.33 ± 22.58	0.158
Burden of kidney disease	17.25 ± 11.19	19.85 ± 12.13	0.567
Psychological field	36.39 ± 11.38	33.90 ± 7.99	0.010
Psychological field	43.13 ± 8.38	42.24 ± 8.42	0.980

The SDS and SAS scores of HD patients with and without infectious diseases

Table 7 shows that the differences in the SDS and SAS scores were not significant in the infectious group compared with the noninfectious group ($P > 0.05$).

Table 8 shows that the differences in the SDS and SAS scores in HD patients among the three infectious subgroups were not significant ($P > 0.05$), suggesting similar symptoms of depression and anxiety between HD patients with and without infectious diseases.

The SSRS scores of HD patients with and without infectious diseases

Table 9 shows that the difference in the SSRS score between HD patients with and without infectious diseases was not significant ($P > 0.05$). **Table 10** shows that, in terms of utilization of support, HD patients with AIDS/HIV had the lowest score, which was significantly different than that in HD patients with syphilis ($P < 0.05$). The results suggested that, although suffering from an infectious disease, HD patients with AIDS/HIV had more difficulty obtaining

social support than did HD patients with hepatitis and syphilis.

Multiple linear regression analysis

The multiple linear regression analysis showed that compared with patients without infectious diseases, the WHOQOL-BREF scores including the scores in

the fields of physiology, psychology, social relations, and the environment, the score of support utilization, and the SSRS total score in the AIDS/HIV subgroup decreased by 1.820, 2.644, 2.959, 1.704, 9.008, 1.782, and 7.194, respectively, after adjusting for age and sex. Compared with the hepatitis B/C virus subgroup, the WHOQOL-BREF scores in the fields of physiology, psychology, social relations, and the environment in the AIDS/HIV subgroup decreased by 2.263, 2.963, 1.772, and 9.621, respectively. Compared with the syphilis subgroup, the WHOQOL-BREF scores in the fields of physiology, psychology, social relations, and the environment in the AIDS/HIV subgroup decreased by 2.769, 3.439, 1.772, and 9.621, respectively (**Table 11** for the corresponding β and P -values; P -values > 0.05 are not listed).

Discussion

To date, no large-scale epidemiological survey data exist on the incidence and treatment of HD patients with infectious diseases. However, with continuous improvement in the level of modern blood purification technology and the extended survival time of patients, the number

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Table 6. Comparison of KDQOL-36 scores among HD patients with different infectious diseases

Item	Hepatitis B/C virus (n = 23)	Syphilis (n = 23)	AIDS/HIV (n = 11)	F values	Inter-group P values
Symptoms of kidney disease	68.39 ± 19.93	70.65 ± 20.87	64.77 ± 19.26	0.318	0.729
Influence of kidney disease	59.65 ± 21.07	50.54 ± 24.35	51.14 ± 21.57	1.075	0.349
Burden of kidney disease	25.82 ± 12.00	20.38 ± 13.70	16.25 ± 9.50	2.492	0.092
Psychological field	35.29 ± 7.99	34.17 ± 8.07	30.42 ± 7.47	1.426	0.249
Psychological field	44.53 ± 8.84 [†]	43.13 ± 7.78 [†]	35.57 ± 5.38 ^{*‡}	5.078	0.009

*Versus hepatitis B/C virus subgroup, $P = 0.004$. [†]Versus AIDS/HIV subgroup, $P = 0.004$ in hepatitis B/C virus subgroup, and $P = 0.007$ in syphilis subgroup. [‡]Versus syphilis subgroup, $P = 0.007$.

Table 7. Comparison of SDS and SAS scores between HD patients with and without infectious diseases and the Chinese norm

	SDS	SAS
HD patients without infectious diseases (n = 50)	45.1 ± 5.1	37.2 ± 5.6
HD patients with infectious diseases (n = 57)	45.8 ± 8.2	38.5 ± 7.7
P values	0.600	0.225

Table 8. Comparison of SDS and SAS scores among HD patients with different infectious diseases

	SDS	SAS
Hepatitis B/C virus (n = 23)	45.3 ± 6.6	41.0 ± 9.0
Syphilis (n = 23)	45.5 ± 8.9	37.0 ± 6.6
AIDS/HIV (n = 11)	47.6 ± 9.8	37.9 ± 6.9
F values	0.330	1.076
P values	0.720	0.348

of these patients has increased gradually. Compared with HD patients without infectious diseases, HD patients with infectious diseases comprise a special group who bear more pressure from family and society, which also directly affects their QOL.

In terms of the general characteristics of the patients, no significant differences were found in age, sex, primary disease, dialysis time, education level, marital status, or occupation between HD patients with and without infectious diseases ($P > 0.05$). However, the subgroup analysis of HD patients with infectious diseases showed that HD patients with syphilis were older with lower education levels. The might be because of the increased survival rate of patients with syphilis due to the treatment of the disease in China, resulting in prolonged life and less suffering from other chronic diseases. However, the low education level of these patients resulted in a lack of general under-

standing of health and awareness of sexually transmitted diseases, resulting in more suffering from syphilis. In addition, this study found that compared with HD patients with AIDS/HIV or syphilis, the hepatitis subgroup had a longer survival time, which might be because hepatitis is a non-sexually transmitted disease.

Therefore, compared with the other two subgroups, the hepatitis subgroup was capable of receiving more social support and achieving better QOL.

Both WHOQOL-BREF and KDQOL-36 scales are QOL scales. KDQOL-36 is specifically designed for dialysis patients. In addition, this study also performed a quantitative analysis of the aspects of emotion and social support. Although HD treatment is capable of saving the lives of patients with end-stage renal disease, the inconvenience caused by HD itself, owing to frequent visits to the hospital for dialysis, high cost of treatment, and strict diet control seriously affect the QOL of patients in the fields of physiology and psychology. Patients undergoing treatment need assistance from medical staff and support from relatives. However, the dependence on relatives, friends, and medical personnel is passive. These patients need much more social concern and help than the general population, which may affect their social relationship and lead to serious negative emotions.

Patients with infectious diseases had even worse scores in terms of QOL, emotions and social support, especially those with AIDS/HIV. In addition, the results of multiple linear regression analysis also suggested that patients with AIDS/HIV had a lower score in the psychological

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Table 9. Comparison of SSRS scores between HD patients with and without infectious diseases and the Chinese norm

Item	Subjective support score	Objective support score	Utilization of support	Total score
HD patients without infectious diseases (n = 50)	19.7 ± 5.4	8.7 ± 2.6	7.0 ± 2.1	35.4 ± 8.2
HD patients with infectious diseases (n = 57)	19.7 ± 6.1	7.9 ± 3.1	6.1 ± 1.7	33.7 ± 9.5
P values	0.999	0.189	0.103	0.318

Table 10. Comparison of SSRS scores among HD patients with different infectious diseases

Item	Subjective support score	Objective support score	Utilization of support	Total score
Hepatitis B/C virus (n = 23)	20.8 ± 6.1	8.1 ± 5.0	6.0 ± 1.7	34.9 ± 11.0
Syphilis (n = 23)	20.3 ± 5.7	8.0 ± 2.7	6.7 ± 1.7*	35.0 ± 8.1
AIDS/HIV (n = 11)	16.2 ± 6.4	7.2 ± 2.1	5.1 ± 1.4 [†]	28.5 ± 7.9
F values	2.384	0.269	3.315	2.151
Inter-group P values	0.102	0.765	0.044	0.126

*Versus AIDS/HIV subgroup, P = 0.013. [†]Versus syphilis subgroup, P = 0.013.

field of WHOQOL-BREF than did patients without any infectious diseases and patients with hepatitis or syphilis. Through interview analysis, it was found that patients with infectious diseases had more severe emotional problems compared with those without infectious diseases, and they were usually confused about their future and had nervous apprehension, worry and fear, exposure to panic, personality disorder, and changeable characteristics. The positive HIV test result significantly affected the mental and physical state of patients with AIDS/HIV. The pressure of the high cost of clinical treatment, discrimination from society and family, death, and lifestyle changes led to a series of adverse reactions in them, such as regret, guilt, loss, despair, strong fear, and even suicidal tendencies. These have made it difficult for patients with AID/HIV to accept the reality of the infection, leading to many psychological problems. However, anxiety and depression are themselves bad moods that cause fatigue and other negative feelings, resulting in deterioration of the physical health of patients. Moreover, the state of anxiety and depression often make patients pay excessive attention to somatic symptoms, thereby strengthening the pain of symptoms and affecting their QOL. Previous studies [13-15] also showed that the anxiety and depression scores of the patients were negatively correlated with the scores in different fields of QOL. These results showed

that the more serious the negative emotions of the patient, the worse the QOL. The negative emotions had a wide range of negative impacts on the QOL of patients and were related to all areas of their lives.

Therefore, this study suggested that helping HD patients with infectious diseases to become social

is an important way to improve their QOL, through government assistance, social care, family support, psychological counseling, and other means to improve the living environment of these patients. Medical staff should actively and positively communicate with these patients with kindness and sympathy, answer their questions timely and clearly, and provide them with effective guidance. They should also allow the patients to talk and cry, alleviate their remorse and shame, advocate nondiscrimination from the family and society, and help them release their tension and anxiety and overcome psychological depression. In addition, they should encourage patients to take the initiative to seek effective social support and understanding, make full use of social support, alleviate negative emotions, improve psychological and social adaptability, and help them build up confidence to live and integrate into mainstream society. On this basis, governments and relevant departments should pay attention to patients with infectious diseases, especially the economic source and life support for patients with AIDS/HIV. When providing psychological counseling, governments and relevant departments should reduce the economic pressure and burden of patients with infectious diseases as far as possible and provide psychological care to ameliorate their psychological anxiety and depression. Through effec-

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Table 11. Multiple linear regression analysis of the psychological score and the grouping of different infectious diseases (after adjusting for age and sex)

		Physiological field	Psychological field	Social relations field	Environmental field	WHOQOL-BREF score	Support utilization	SSRS total score
3 vs. 0	B	-1.820	-2.644	-2.959	-1.704	-9.008	1.782	-7.194
	95% CI	-3.489, -0.152	-4.115, -1.172	-4.595, -1.322	-2.935, -0.473	-15.057, -2.959	-3.047, -0.516	-13.160, -1.229
	P-value	0.0349	0.0006	0.0006	0.0078	0.0043	0.0069	0.0200
3 vs. 1	B		-2.263	-2.963	-1.772	-9.621	-	-
	95% CI		-3.914, -0.612	-4.799, -1.127	-3.153, -0.390	-16.409, -2.833		
	P-value		0.0084	0.0021	0.0135	0.0065		
3 vs. 2	B		-2.769	-3.439	-1.772	-9.621	-	-
	95% CI		-4.357, -1.180	-5.206, -1.673	-3.153, -0.390	-16.409, -2.833		
	P-value		0.0009	0.0002	0.0135	0.0065		

0, Noninfectious diseases; 1, hepatitis B/C virus; 2, syphilis; 3, HIV/AIDS.

tive psychological support and behavioral intervention, helping patients regain confidence in life and promoting better coordination of treatment and care can effectively improve their QOL.

However, this study was a single-center survey with only a few cases, leading to a certain degree of bias. Therefore, further studies are needed to assess the QOL and mental health of HD patients with infectious diseases, providing a reliable scientific basis for further improving the QOL of such patients and guiding the direction of clinical intervention.

In conclusion, this study found that, compared with HD patients without infectious diseases, HD patients with infectious diseases (including hepatitis B/C virus, syphilis, and AIDS/HIV), especially patients with AIDS/HIV, had a lower QOL, much more serious negative emotions (depression and anxiety), and difficulty in obtaining social support.

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Disclosure of conflict of interest

None.

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