

Effect of Hepatitis C Viral Infections on Quality of Life in Patients Undergoing Hemodialysis: A Comparative Study

Mithal Yaseen Abed^{1*}, Dr. Fatma Makee²

¹Nursing Collage, University of Kerbela, Iraq

² Professor, Adult Nursing, Nursing College, Karbala University, Iraq

ABSTRACT

Background: Hemodialysis patients are more susceptible to infections due to decreased immune responses. In dialysis patients, chronic hepatitis C leads to viral hepatitis. Patients on hemodialysis face many challenges that can reduce their overall health and quality of life. **Methods:** Patients on hemodialysis participated in the design of this comparative study. Each individual in each of the 100 samples (50 positive study groups and 50 negative groups) Patients participated in the research by completing a specific questionnaire between October 2023 and August 2024. Information was collected and evaluated using statistical criteria. People in the holy city of Karbala who frequently use hemodialysis facilities were the subjects of the research. Subjects participated in the study after being individually recruited, and questionnaires were developed. An opportunity randomly selected by the researcher using his or her own experiences and data from previous investigations. The first part of the questionnaire inquired about patients' demographics and social situations, while the second part asked about their quality of life according to WHO standards. SPSS version 26 was used for the purpose of analyzing and interpreting the data. **Results:** The mean total score of health-related quality of life among the study sample (viral hepatitis positive) was (61.08 ± 5.813) . The mean total score of health-related quality of life among the study sample with viral hepatitis negative was 84.30 ± 10.436 . There was a significant association between the differences in health-related quality of life for viral hepatitis positive and negative, with p values of 0.001 and 0.05, respectively. showed that (56.32) physical, (59.68) psychological, (30) social –relationship, (82.48) environmental, (61.08) overall health related quality of life in positive viral hepatitis while Negative Viral Hepatitis was (92.4) physical, (83.6) psychological, (33.92) social –relationship, (99.68) environmental, (84.3) overall health related quality of life. No significant association was observed between viral hepatitis and factors such as marital status, educational levels, occupation, and duration of dialysis treatment, except for age. Economic status showed a significant chi-square value of 11.50 with 4 degrees of freedom and a p-value of 0.021, while another chi-square value of 6.61 with 2 degrees of freedom had a p-value of 0.037. **Conclusions:** The study found that viral hepatitis significantly affects the quality of life of individuals undergoing dialysis. It suggested developing a comprehensive health education program aimed at enhancing patients' knowledge and awareness regarding the prevention and transmission of viral hepatitis. This initiative can be effectively communicated through various channels, including media, leaflets, in hemodialysis centers.

Keywords: End-Stage Renal Disease, Hemodialysis, Viral Hepatitis, Health-Related Quality of Life

INTRODUCTION

Hemodialysis is an arduous and ongoing medical procedure associated with severe lifestyle restrictions, annoying side effects, and even fatal consequences [1]. Dietary restrictions, medications, and dialysis are the mainstays of End-Stage Renal Disease (ESRD) treatment plans aimed at maximizing recovery of kidney function. Any number of diagnostic and therapeutic procedures may be performed to confirm the functional status of the kidneys. These tests are collectively known as kidney function tests. In order to monitor cardiovascular problems, dialysis users should be monitored frequently [2]. Symptoms like nausea, nocturia, decreased appetite, and weakness can occur in patients whose Glomerular Filtration Rate (GFR) is less than 60 mL/min. dangerous waste products, mainly urea, building up in the blood [3]. Circulatory problems are a frequently occurring complication in individuals undergoing HD, when fluid is removed by HD or ultrafiltration (UF), blood pressure often falls. Twenty to thirty percent of individuals undergoing routine HD experience intradialytic hypotension [4]. Chronic hemodialysis (HD) patients are particularly vulnerable to infection because treatment requires continuous vascular access. Simultaneous administration of dialysis to a large number of patients increases the risk of transmission of infectious diseases via contaminated instruments, supplies, surfaces, and hands of medical personnel, The risk of nosocomial infection is higher in HD

patients due to immunosuppression, frequent hospitalizations, and surgery [5]. Patients undergoing hemodialysis face an elevated risk of hepatitis C virus (HCV) infection compared to the general population, influenced by geographic factors [6]. Hepatitis C virus (HCV) causes parenteral infection that can progress to chronic active hepatitis, cirrhosis, and primary liver cancer. Because of the large variations in the nucleotide sequence of the viral genome, there are many genotypes and subtypes of hepatitis C virus worldwide [7]. Hepatitis C infection is more common in people with a history of blood transfusions, in patients who receive frequent medical care, and in anyone who may come into contact with contaminated patients or equipment. A long course of dialysis treatment may be associated with an increased risk of HCV transmission [8]. Dialysis patients with poor physical function have been found to have shorter survival rates than those with better physical condition. Anxiety and sadness are associated with decreased physical performance and daily physical activity. Evidence indicates disparities in health quality of life status among hemodialysis patients across different racial and ethnic groups [9]. The concept of quality of life (QoL), is broad and multifaceted, typically including subjective assessments of both positive and negative aspects of life [10]. According to the World Health Organization, an individual's assessment of his or her place in the world is influenced by his or her

cultural background, values, aspirations, standards, and problems. The assessment of the general health and future prospects of hemodialysis patients increasingly depends on their quality of life [11]. While HD has been shown to improve clinical outcomes, patients may experience hemodynamic and metabolic changes due to various factors such as disease-related disorders, treatment side effects, daily activities, and social changes. These changes have a significant impact on people's quality of life [12], new study suggests that reduced quality of life may be a contributing factor to higher mortality among patients infected with (HCV) [13]. Several studies conducted in Iraq have shown among hemodialysis patients, the incidence of hepatitis C virus infection was 6.6% in Karbala Governorate, 5.66% in Diwaniyah City, 9.2% in Kurdistan Region, 46.36% in Al-Kindi Teaching Hospital Center in Baghdad, and 20% in Mosul Region [14].

Physical variables include blood urea nitrogen (BUN), hematocrit, hemoglobin, albumin, calcium, and phosphorus, as well as duration of dialysis treatment and presence of chronic comorbidities [15]. Patients on dialysis are at increased risk of hepatitis C infection due to frequent blood transfusions, hospital stays, and contaminated units. The life expectancy of dialysis patients is significantly affected by hepatitis C virus and its side effects. The mortality rate in dialysis patients infected with hepatitis C virus was higher than in uninfected patients [16].

Methods

Study Design

To fulfill the objectives of this study, A comparative study, aimed to evaluate the impact of viral infection on health-related quality of life in patients undergoing hemodialysis by comparing two groups of samples (positive and negative) infected with viral hepatitis. The study started between October 2023 and January 2024.

Study Instruments

Questionnaires are a great way to get the information we need to conduct the study and get the results we want. To achieve this goal, the researcher carefully designed this questionnaire to clarify the objectives and importance of the study. Initial inquiries for the study are systematically collected in order to do this. The questionnaire is divided into two parts, each designed to collect data from research participants in the most effective way. Sociodemographic information are collected in the first part. Quality of life and health were assessed using the final component of the WHOQOL-BREF. Responses ranged from “not always” to “great extent”. This health-related questionnaire, the WHOQOL-BREF, was developed specifically to assess quality of life in people diagnosed with end-stage renal disease (ESKD). The 26-item assessment examines four main aspects of quality of life: interpersonal relationships, physical and mental well-being, and environmental concerns.

Result

Study Sitting

This study was conducted in Imam Hussein Medical City and in two centers: Adel Al-Sabah Center for the positive group and Habib Bin Mazaher Center for the negative group, which treats kidney dialysis patients.

Validity

To improve the validity of the instrument, an expert panel of 9 study areas examined it. Professional reviewers added and removed items from the study instruments. The tool is considered legitimate after taking into account the opinions and recommendations of experts

Pilot Study

perform a pilot study prior to collecting data in order to evaluate reliability of study instruments. It was conducted in the Habib Ibn Mazahir Center and the Adel Sabah Center in the period from (January 21 to 28), 2024 on a pilot study sample consisting of (10) patients who were not included in the study's initial sample.

Reliability of the Questionnaire

The reliability of the study tool was evaluated using Cronbach's alpha coefficients. The test results showed satisfactory as shown below for the format of the structured questionnaire that was conducted on a sample of (100), which constitutes 10% of the total population

Sample of the Study

A purposive study will involve a purposeful sample of 100 patients, who will be divided into two groups. There are two types of hepatitis infections: viral and non-viral.

Criteria for Sample Selection

Inclusion Criteria

- Who were diagnosed with infection and receiving medical care at the hemodialysis unit.
- A specialized test was used to obtain diagnosis.

Exclusion Criteria

- Patients undergoing dialysis for less than 6 months.
- Patients who refused to participate in the study.
- Participants who were included in the pilot study.

Data Collection Methods

The implementation phase extended from for the period from (10 April to May 12, 2024.

Data Analysis

Statistical Analysis of Data the Statistical Package for the Social Sciences (SPSS), version 26, was used to evaluate and interpret the data.

Table 1(A): Summery Statistics of the Health – Related Quality of Life among Study Sample (Positive and Negative Hepatitis)

Main Studied Domains	Mean	Std. Deviation	Range	Minimum	Maximum
Positive Viral Hepatitis					
Physical	56.32	7.221	32	44	76
Psychological	59.68	9.208	40	36	76
Social-Relationship	30.00	8.010	36	12	48
Environmental	82.48	9.103	40	64	104

Table 1(b): Summery Statistics of the Health – Related Quality of Life among Study Sample (Positive and Negative Hepatitis)

Main Studied Domains	Mean	Std. Deviation	Range	Minimum	Maximum
Overall, Health Related Quality of Life	61.08	5.813	23	50	73
Negative Viral Hepatitis					
Physical	92.40	16.107	72	48	120
Psychological	83.60	11.606	60	44	104
Social-Relationship	33.92	9.467	36	16	52
Environmental	99.68	17.02	40	64	104
Overall Health Related Quality of Life	84.30	10.436	51	51	102

Minimum and maximum values are indicated by M. Mean Total Score, Standard Deviation Standard Deviation of Total Score. The data in Table 1 show the health-related quality of life of the study sample participants with hepatitis positive and negative. The mean health-

related quality of life score among the study samples (viral hepatitis positive) was 61.08 ± 5.813 . The mean health-related quality of life score among the study sample (viral hepatitis negative) was 84.30 ± 10.436 , with a standard deviation of 10.436.

Table 2: Statistical Difference in Health-Related Quality of Life between Positive and Negative Viral Hepatitis

Main Studied Domains	Viral Hepatitis	N	Mean Rank	Sum of Ranks	Mann-Whitney U	p-Value
Physical	Yes	50	26.92	1346.00	71	0.001 Significant
	No	50	74.08	3704.00		
	Total	100				
Psychological	Yes	50	28.58	1429.00	154	0.001 Significant
	No	50	72.42	3621.00		
	Total	100				
Social-Relationships	Yes	50	44.91	2245.50	970.5	0.05 Significant
	No	50	56.09	2804.50		
	Total	100				
Environmental	Yes	50	36.00	1800.00	525	0.001 Significant
	No	50	65.00	3250.00		
	Total	100				
Overall, Health – Related Quality of Life	Yes	50	27.39	1369.50	94.5	0.001 Significant
	No	50	73.61	3680.50		
	Total	100				

Table 2 shows that there is significant association Health-Related Quality of Life between Positive and Negative Viral Hepatitis at p- value =0.001, 0.05) respectively.

Discussion

For patients receiving hemodialysis, hepatitis C virus infection is a serious risk. This comorbidity is the most serious and can significantly reduce their quality of life. Viral Hepatitis study groups respectively are at the age group of 50-59 years old, 28.0% and 30.0% respectively are in the age group more of 60. Research believed that older individuals have less physical ability compared to younger people. Compared to other age groups, the higher prevalence of chronic health problems among this group led to higher levels of pain and suffering, which had a significant impact on their overall quality of life. In terms of sex, it reveals that 58.0% of members in the positive groups are significantly male. One of the most important of these is the effect of sex hormones on gene expression, including the immune system, and how this affects the disparity in prevalence rates between males and females, which may contribute to these disparities. Estrogens have a different effect on the immune system compared to androgens, as they enhance their activity. Immunosuppression refers to suppressing or weakening the immune system.

After menopause, the effect of sex on HCV disease decreases due to a significant decrease in estrogen levels. There are significantly more urbanites in group (positive), respectively (62.0%). Urban patients were able to obtain medical treatment more quickly and efficiently than rural residents, as for the educational level, most of the study 50.0% of the positive study group had primary school, and 22.0% of group had middle school. The importance of an

individual's educational background in understanding the hemodialysis process, pursuing health education about meal restriction and fluid restriction schedules, and following a specific hemodialysis schedule. The terms economic status, 48.0% of the positive group is medium. Table 4-1 shows the quality of life of the study sample is positive. According to the findings, It appears that, the dialysis patient's quality of life was affected by viral he that, the average for the study sample (viral hepatitis positive) was 61.08 ± 5.813 . Consistent with study Raju, R., & Latha, S [17], the Most dialysis patients, 68.3% to be exact, report an average quality of life. Consistent with the study by Pompe et al. 2019. Overall quality of life was good at 1 year, with a mean of 82.54 (SD = 11.63). Consistent with study Tayea et al. [14] that average total quality of life was seen in 85% of the studied negative hepatitis patients. Table (4-2) shows There is a notable relationship between disparities in (HRQOL) between individuals with positive, negative viral hepatitis at p- value =0.001, 0.05) respectively difference in health-related quality of life between positive viral hepatitis and negative viral hepatitis showed the study found that the environment provides the highest levels of quality of life, while social relationships provide the lowest level of quality in both the viral hepatitis positive and negative groups. that physical (56.32), psychological (59.68), social – relationship (30) , environmental (82.48), overall health related quality of life (61.08) in positive viral hepatitis while Negative Viral Hepatitis was physical (92.4) psychological (83.6), social – relationship (33.92), environmental (99.68), overall health related quality of life (84.3). Supporting the findings of Yonata et al.[18] found that the majority of patients reported a high quality of life (84 out of 67.7%), while a small proportion (32.3% to be precise) reported a low quality of life. Poor quality of life has also been linked to comorbidities such as depression and hunger, as well as increased

mortality. Factors that can affect results include anemia, age, duration of dialysis, comorbidities, and drug use, associated with HRQoL individuals in dialysis Yonata et al. [18]. Not consistent with the study Pretto CR et al (2020), the HRQoL ratings are poor on the dimensions of the physical component, the mental component, with greater value related to assistance with the dialysis team. These results indicate that the health of dialysis patients is at risk due to their physical, psychological and emotional state, and the difficulty of continuing to work, and that support is a vital tool in coping with this situation. according to Pretto CR et al. [19] Hospitalization and infections reduce healthy quality of life, but can be managed with health-promoting preventive and therapeutic treatments. Disagree with the study, Malleshappa P [20] social support indicated excellent quality of life in dialysis patients. Good social support is crucial to maintaining a positive quality of life in these individuals. Disagree with results of Shahrin's et al. study, individuals performed worse physically than mentally. The total score for the physical component was 33.89 ± 11.83 , while the total score for the mental component was 50.23 ± 8.88 . According to Barreto et al. [12], disagree with the study found that mental health provided the highest quality of life, while physical health provided the lowest. These data are supported by component summaries, which show that the mental component is superior to the physical component, with the lowest scores being physical performance (26.78) and the highest scores being mental health (72.16).

In contrast to what was found in the study, psychological quality of life had the highest rating ($M = 62.83$, $SD = 14.80$), but physical health had the lowest rating. most surprising parts of the report were the sections on social relations (100) and the environment (94). Hemoglobin levels greater than 11 g/dL inhibit physiological responses associated with anemia including cardiac hypertrophy, decreased cardiac output, vasodilation, and increased venous return [21]. Research believed that ability to maintain one's physical health within optimal limits is an essential element of this disease that enables patients to maintain their quality of life. According to

Afsar et al. [22] in HD patients, hepatitis C virus results in decreased health of quality of life, especially in the area of mind. Cognitive impairment in hepatitis C patients infected with HCV may be exacerbated by the presence of mild encephalopathy. Cognitive impairment, also called "mild encephalopathy," is known to be frequently present in patients with cirrhosis even in the absence of clinical encephalopathy. There may be an association between increased prevalence of depression and lower MCS in HD patients infected with HCV, which may be explained by the effect of infection on cognitive function.

Conclusions

Compared to the number of female participants in the study, the majority of male participants in the sample were aged between 55 and 59 years. Sociodemographic factors such as age, gender and economic status were significantly associated with the presence of viral hepatitis in patients. The p-values of 0.021 and 0.037 suggest that the quality of life of chronic hemodialysis patients should be improved, and specialized nurses should conduct awareness campaigns or courses in centers to provide excellent health education about viral hepatitis infection, diet, medications and lifestyle modifications, as well as dialysis treatment.

Acknowledgments

The researchers would like to thank all the hemodialysis patients who participated in this study. The researchers also thank the members of the Ethics Committee of the College of Nursing, University of Karbala, for their guidance and support. We are very grateful for the wonderful support and cooperation provided by the dialysis centers and the Directorate of Health of the Holy Karbala.

Disclosure of Financial Information

There is no funding for this research. This research was conducted as part of a Master's thesis in Nursing approved by the College of Nursing, University of Karbala, Iraq.

References

- [1] A. Alshraifeen, M. McCreddie, and J. M. Evans, "Quality of life and well-being of people receiving haemodialysis treatment in Scotland: A cross-sectional survey," *International journal of nursing practice*, vol. 20, no. 5, pp. 518–523, 2014.
- [2] B. A. J. Al-Ani and F. M. Mahmood, "Assessment Of Hemodialysis Patient's Compliance To The Treatment And Follow Up In Baghdad Teaching Hospitals," *Kufa Journal for Nursing sciences*, vol. 4, no. 2, pp. 128–137, 2014.
- [3] W. Dwi Nurbadiyah, N. Nursalam, I. Yuni Widayati, and A. Wahyu Kurniawan, "Factors associated with quality of life among patients undergoing hemodialysis in Indonesia," 2023.
- [4] A. A. LUBIS and R. A. NASUTION, "PHARMACEUTICAL CARE IMPROVED THE QUALITY OF LIFE OF PATIENT WITH HEMODIALYSIS," *International Journal of Current Pharmaceutical Research*, vol. 11, no. 6, 2019.
- [5] H. A. A. Athbi and W. K. Mohammed, "Effect of Infection Control Education Program on Nurses Staff's Knowledge in Hemodialysis Units in Baghdad Teaching Hospitals," in *Tenth National Scientific Conference*, 2012, pp. 529–550.
- [6] S. K. Khalaf and A. A. Hussein, "Detecting and genotyping of HCV among hemodialysis patients in Diyala governorate," in *AIP Conference Proceedings*, 2022, vol. 2398, no. 1: AIP Publishing LLC, p. 040010.
- [7] W. Sievert *et al.*, "A systematic review of hepatitis C virus epidemiology in Asia, Australia and Egypt," *Liver international*, vol. 31, pp. 61–80, 2011.
- [8] H. A. Athbi and N. A. Jasim, "Prevalence and Risk Factors for Hepatitis C and B Viruses Infection among Hemodialysis Patients in Holy Karbala, Iraq," *Kufa Journal for Nursing Sciences*, vol. 5, no. 3, p. 4, 2015.
- [9] J. Lee *et al.*, "Impact of health-related quality of life on survival after dialysis initiation: a prospective cohort study in Korea," *Kidney research and clinical practice*, vol. 39, no. 4, p. 426, 2020.
- [10] K. Kalantar-Zadeh and M. Unruh, "Health related quality of life in patients with chronic kidney disease," *International urology and nephrology*, vol. 37, no. 2, pp. 367–378, 2005.
- [11] S. Alshelleh, H. Alhawari, A. Alhourri, B. Abu-Hussein, and A. Oweis, "Level of depression and anxiety on quality of life among patients undergoing hemodialysis," *International journal of general medicine*, pp. 1783–1795, 2023.
- [12] M. A. Barreto, M. Cattafesta, A. C. d. Cunha, M. P. C. P. Paixão, E. T. d. Santos Neto, and L. B. Salaroli, "Relationship between quality of life and sociodemographic, clinical and lifestyle characteristics of patients undergoing hemodialysis," *Journal of Human Growth and Development*, vol. 33, no. 3, pp. 444–469, 2023.

- [13] M. Y. Abed and F. Makee, "The Differences in Quality of Life according to Demographic Characteristics in Patients Undergoing Hemodialysis," *Central Asian Journal of Medical and Natural Science*, vol. 5, no. 4, pp. 93–100, 2024.
- [14] K. Tayea, M. Hussein, B. Khalil, and S. El Wasif, "Effect of hemodialysis long life program on the quality of life of patients with end stage renal disease," *Egyptian Journal of Health Care*, vol. 13, no. 2, pp. 857–871, 2022.
- [15] E. N. Yilmaz, C. Bal, S. M. Harbali, Z. Sağlam, and Z. Koç, "The relationship between quality of life and dietary fluid restriction non-adherence in hemodialysis patients. New Trends and Issues Proceedings on Humanities and Social Sciences," vol. 10, no. 2, 2023.
- [16] S. Akhtar, J. A. Nasir, M. Usman, A. Sarwar, R. Majeed, and B. Billah, "The prevalence of hepatitis C virus in hemodialysis patients in Pakistan: A systematic review and meta-analysis," *Plos one*, vol. 15, no. 5, p. e0232931, 2020.
- [17] R. Raju and S. Latha, "A Correlational Study On Quality Of Life And Coping Strategy Among Dialysis Patients In Selected Hospital At Mangalore," *Journal of Health and Allied Sciences NU*, vol. 2, no. 04, pp. 08–11, 2012.
- [18] A. Yonata, N. Islamy, A. Taruna, and L. Pura, "Factors affecting quality of life in hemodialysis patients," *International Journal of General Medicine*, vol. 15, p. 7173, 2022.
- [19] C. R. Pretto, E. R. Winkelmann, L. M. Hildebrandt, D. A. Barbosa, C. d. F. Colet, and E. M. F. Stumm, "Quality of life of chronic kidney patients on hemodialysis and related factors," *Revista latino-americana de enfermagem*, vol. 28, p. e3327, 2020.
- [20] P. Malleshappa, "Coping strategies and quality of life in patients receiving chronic hemodialysis," *Türk Nefroloji Diyaliz ve Transplantasyon Dergisi*, vol. 27, no. 2, pp. 146–149, 2018.
- [21] S. Sutrisno, A. Fawzi, and M. S. Dwiangimawati, "The Different of Quality of Life Between Patient with Kidney Failure Undergoing Hemodialysis and Continous Ambulatory Peritoneal Dialysis (CAPD)," *STRADA: Jurnal Ilmiah Kesehatan*, vol. 8, no. 1, pp. 28–33, 2019.
- [22] B. Afsar, R. Elsurur, S. Sezer, and N. F. Ozdemir, "Quality of life in hemodialysis patients: hepatitis C virus infection makes sense," *International urology and nephrology*, vol. 41, no. 4, pp. 1011–1019, 2009.



This is an open-access article distributed under the terms of the Creative Commons Attribution License.