Perceptions Toward the Importance of Adherence to Hemodialysis Treatment Modalities among Patients with End Stage Renal Failure: evaluated study

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المستخلص:

الهدف: يهدف هذا البحث لتقويم فاعلية برنامج ارشادي حول تصورات مرضى الفشل الكلوي في المرحلة النهائية عن مدى التزامهم بعلاج الغسيل الكلوي.

المنهجية: أجريت تجربة عشوائية محكومة شبه تجريبية على 106 مريض يعانون من الفشل الكلوي في المرحلة النهائية ويخضعون لغسيل الكلى، وتم تقسيمهم عشوائياً إلى مجموعات الدراسة والسيطرة عن طريق أخذ عينات عشوائية في مركز غسيل الكلى في مستشفى الصدر التعليمي في عام ٢٠٢٤. البيانات تم جمعها باستخدام استبيان الالتزام بمرض الكلى ESRD–AQ في نهاية المرحلة .وتم استخدام الإحصاء الوصفي والاستنتاجي في تحليل البيانات.

النتائج: أظهرت النتائج وجود فروق ذات دلالة إحصائية بين (مجموعة الدراسة والمجموعة الضابطة) فيما يتعلق بالالتزام بالعلاج بالغسيل الكلوي بين مرضى الفشل الكلوي في المرحلة النهائية بعد تلقي برنامج ارشادي.

الاستنتاج: استنتجت الدراسة إلى أن البرنامج الارشادي له تأثير في تحسين الالتزام بغسيل الكلى

التوصيات: نظرًا لضعف الإدراك بين مرضى الفشل الكلوي في المرحلة النهائية حول الالتزام بالجوانب العلاجية المختلفة، أوصت هذه الدراسة بتوفير برنامج تعليمي لمرض الكلى في المرحلة النهائية يتم تطبيقه خلال فترة ما قبل غسيل الكلى لتعزيز معرفتهم وإدراكهم للالتزام بغسيل الكلى.

رقم تسجيل التجربة: تم تسجيل التجربة من قبل السجل الإيراني للتجارب السريرية (IRCT)بمعرف (IRCT20231124060162N1) IRCT تاريخ التسجيل ٢٠٢٤-٠١-٠١

الكلمات المفتاحية: الإدراك، الالتزام، غسيل الكلى، المرحلة النهائية من الفشل الكلوي.

Abstract

Objective: This study aims to evaluate the effectiveness of an instruction program for end-stage renal failure patients' perceptions of their adherence to hemodialysis treatment.

Methods: A quasi-experimental randomized controlled trial was conducted on Non-probability purposive 106 patients with end-stage renal failure undergoing hemodialysis, divided randomly into study and control groups by block random sampling at Al-Sader Teaching Hospital Dialysis Center in 2024. Data were collected using an end-stage renal disease adherence questionnaire, ESRD-AQ. Descriptive and inferential statistics were used in data analysis.

Results showed statistically significant differences between (the study group and control group) regarding adherence to hemodialysis treatment among patients with end-stage renal failure after receiving an instruction program.

Conclusion: The study concluded that the instruction program has effectively improved adherence to hemodialysis

Recommendation: Due to the poor perception among end-stage renal failure patients about adherence to different treatment aspects, this study recommended providing an instruction program for end-stage renal disease applying during pre-hemodialysis time to enhance their knowledge and perception of adherence to hemodialysis.

trial registration number: the trial was registered by the Iranian Register of Clinical Trials (IRCT) with IRCT ID (IRCT20231124060162N1) registration date 2024-01-01

Keywords: perception, adherence, hemodialysis, End Stage Renal Failure.

Introduction

End-stage renal failure (ESRF) is a serious and public health concern characterized by permanent loss of kidney function and high mortality rates that require long-term treatment [1,2]. Globally, the prevalence of end-stage renal failure among people might potentially reach 16%. Approximately 1.4 million patients worldwide are undergoing renal replacement therapy, with an annual incidence rate of 8% [3]. According to statistical reports from the Iraqi Ministry of Health, there has been a significant

increase in the number of instances of renal failure, as seen in Figure 1

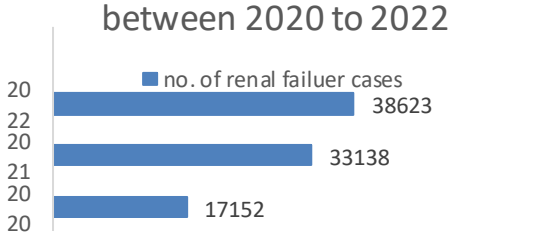

Figure 1 Iraqi Ministry of Health Report of renal failure cases

To maintain good health and survival, patients may require medical interventions such as kidney transplants or extended periods of dialysis [4,5,6]. One of the most common forms of treatment for end-stage renal failure is hemodialysis, a procedure in which the blood is filtered outside the body to remove waste, maintain electrolyte balance, and eliminate toxins and excess water from the blood [7,8]. Hemodialysis is typically performed multiple times a week for several hours at a time, making it a demanding and time-consuming treatment [9].

When patients begin hemodialysis therapy, they need to modify their daily routine and face many challenges related to self-care, such as attending all scheduled sessions, adhering strictly to prescribed drugs, reducing fluid intake, and monitoring dietary choices [10]. Adhering strictly to the prescribed treatment is crucial for maintaining optimal health [11,12]. However, studies have shown that many patients struggle to adhere to their treatment regimen, leading to poor outcomes and an increased risk of complications [13]. These struggles include financial, medical, and mental health issues and conflicts with dietary limitations, which can significantly impact their adherence to hemodialysis. Understanding patients' perceptions towards hemodialysis adherence

is essential for healthcare providers to improve patient outcomes and overall quality of life [14].

A significant number of individuals with end-stage renal failure (ESRF) who receive hemodialysis fail to stick to their prescribed treatment plans [15]. As a result, there is a serious concern about the potential increase in morbidity, mortality, healthcare expenses, and strain on the healthcare system due to non-adherence [16]. Hemodialysis involves a significant time commitment, requiring patients to visit a dialysis center multiple times a week and spend hours connected to a machine. This can be physically and emotionally demanding, leading to feelings of frustration, fatigue, and burnout [17].

Studies, such as the one conducted by Muscat et al., emphasize the crucial role of patients' perceptions in influencing their motivation, behavior, and engagement with their treatment plan [18]. The lack of research on adherence among hemodialysis patients in Arab nations further underscores the need to evaluate the effectiveness of instructional programs on patients' perception of treatment adherence in this population [19,20]. This study addresses the implications of patient perception on hemodialysis adherence to improve outcomes for end-stage renal failure patients.

Objective: This study aims to evaluate the effectiveness of an instruction program for end-stage renal failure patients' perceptions of their adherence to hemodialysis treatment.

Methodology

A quasi-experimental control trial study evaluates the effectiveness of an instruction program on end-stage renal failure patients' perceptions towards adherence to hemodialysis treatment. The study population consisted of adults with end-stage renal failure patients who received maintenance hemodialysis treatment, completed the inclusion criteria listed below, and were willing to participate. **Inclusion Criteria:** Subjects eligible for inclusion are patients with end-stage renal failure undergoing maintenance hemodialysis treatment from 18 to 65 years of both genders willing to be involved in the study, agree to participate in the study, and

give a written consent form, read and writing; patients should be on regular hemodialysis for at least 6 months. **Exclusion Criteria:** The subjects were excluded if they refused to participate in the study; patients who could not write and read, patients with mental state disorders, and Patients who had undergone hemodialysis for less than 6 months were excluded from the current study.

Blocks randomization sampling was used to assign the study sample, 106 participants, into a study group and a control group. Use block random sampling in this study to ensure sample adequacy, that each participant has an equal chance of being assigned to any group, the possibility of comparison between the groups of the study and the control group, as well as to generalize the results of the study to the population [21].

The study data was collected after obtaining official permission from the appropriate authorities. On 10/11/2023, the study was approved by the Council of the Nursing College/University of Baghdad. Following this, on November 22, 2024, the study received approval from the Research Ethics Committee of the University of Baghdad's College of Nursing. The administrative authorities of the hospital were also provided on 2/1/2024, and the patients' approval was obtained.

The trial was registered by the Iranian Register of Clinical Trials (IRCT) with IRCT ID (IRCT20231124060162N1) registration date 2024-01-01, which ensures Helsinki approval.

The Arabic version of the End Stage Renal Failure Adherence Questionnaire (ESRD-AQ) is used to evaluate the effectiveness of an instruction program for end-stage renal failure patients' perceptions of their adherence to hemodialysis treatment in four dimensions: hemodialysis attendance, medication use, fluid restrictions, and diet recommendations [22].

It’s the first valid and reliable instrument used to measure treatment adherence. Its validity and reliability have been confirmed by Kim et al. The final version of the ESRD-AQ consists of 46 questions divided into five parts. The first part pursues general information about end-stage renal failure patients and renal

replacement therapy-related history (five questions), and the remaining four parts ask about treatment adherence to hemodialysis treatment (14 questions), medications (9 questions), fluid limiting (10 questions), and diet monitoring (8 questions). These four final parts directly measure adherence behaviors and patients' knowledge and perceptions about treatment. The attitude/perception subscale is scored by summing the responses to questions 11, 12, 22, 23, 32, 33, 41, and 42. The ESRD-AQ is designed so that higher scores indicate better adherence.

The remaining questions obtain information about patients' ESRD and RRT-related history. Responses to the ESRD-AQ utilize a combination of Likert scales, multiple choice, and “yes/no” answer format [23].

In this study, 109 patients agreed to participate as a study sample. Among them, two clients passed away during the data collection process. Also, one was withdrawn from participation because they refused the intervention. In the end, 106 patients were included in the data analysis. The data collection started from January 2024, till April 2024. For all participants, ESRD-AQ was used to measure hemodialysis adherence behavior. No instruction program was applied for the control group; only routine interventions were given by the health care provider. For the study group, Patients received an instruction program with two lectures per week for two weeks at Al-Sader Teaching Hospital Dialysis Center. **Results:**

Table (1): Distribution for Both Groups According to Socio-demographic Characteristics

Characteristics		Study n=53		Control n=53	
		F	%	F	%
Age (years)	18 – 27	7	13.2	7	13.2
	28 – 37	6	11.3	4	7.5
	38 – 47	11	20.8	14	26.4
	48 – 57	13	24.5	14	26.4
	58 – 65	16	30.2	14	26.4

Gender	Male	27	50.9	29	54.7
	Female	26	49.1	24	45.3
Marital Status	Single	6	11.3	10	18.9
	Married	38	71.7	36	67.9
	Divorced	6	11.3	0	0
	Widow	3	5.7	7	13.2
Education Level	Read and Write	8	15.1	10	18.9
	Primary School	20	37.7	23	43.4
	Middle School	14	26.4	8	15.1
	High School	5	9.4	5	9.4
	Diploma	6	11.3	5	9.4
	Bachelor's	0	0	2	3.8
Residence	Rural	43	81.1	39	73.6
	City	10	18.9	14	26.4

***n= Sample size, F=frequency, %= percentage**

Table 1 displays the demographic characteristics of the study participants. The results indicate that the majority of end-stage renal failure patients in both groups were in the 58-65 age category, accounting for 30.2% in the study group and 26.4% in the control group. Additionally, the majority of the study sample in both groups were male, representing 50.9% in the study group and 54.7% in the control group, with the remaining being female. Furthermore, the results show that 37.7% of the sample in the study group and 43.3% in the control group had primary school education. In terms of marital status, the study reveals that the majority of the sample were married, accounting for 71.7% of the entire sample in the study group and 67.9% in the control group. Finally, the study also indicates that the highest percentage of the entire sample in both groups resided in rural areas, with 81.1% in the study group and 73.6% in the control group.

Table (2): Perception Categories Toward the Importance of Hemodialysis, Medicines, Fluid, and Diet at Pre-test Trials for Both Groups

Items of Perception	Groups	Perception Categories F(%)			Mean ± SD
		Highly/Very important	Moderately important	Little/Not important	

Importance of HD Attendance	**Study**	2(3.8)	5(9.4)	46(86.8)	1.69 ± (0.86)
	Control	6(11.3)	5(9.4)	42(79.2)	1.96 ± (1.07)
Importance of Medication	**Study**	7(13.2)	10(18.9)	36(67.9)	2.16 ± (1.05)
	Control	9(17.0)	9(17.0)	35(66.0)	2.26 ± (1.07)
Importance of Fluid Restrictions	**Study**	11(20.8)	21(39.6)	21(39.6)	2.73 ± (0.94)
	Control	0(0)	11(20.8)	42(79.2)	1.86 ± (0.98)
Importance of Diet Restrictions	**Study**	10(18.9)	13(24.5)	30(56.6)	2.60 ± (1.02)
	Control	4(7.5)	11(20.8)	38(71.7)	2.18 ± (1.11)
Highly/Very important =5 or 4; Moderately important=3; Little/Not important=1or2.					

Study group n=53; Control group n=53.

Table 2 presents perception categories toward the importance of hemodialysis at pre-test trials for both groups; the findings show that the majority of patients in both the study and control groups have little or no important response toward all treatment aspects. This finding represents a low perception level in both groups.

Table (3): Perception Categories Toward the Importance of Hemodialysis, Medicines, Fluid, and Diet at Post-test Trials for Both Groups

Items of Perception	Groups	Perception Categories F(%)			Mean ± SD
		Highly/Very important	Moderately important	Little/Not important	

Importance of HD Attendance	Study	52(198.1)	0(0)	1(1.9)	4.77 ± (**0**.42)
	Control	6(11.3)	1(1.9)	46(86.8)	1.66 ± (**0**.75)
Importance of Medication	Study	52(98.1)	1(1.9)	0(0)	4.69 ± (**0**.50)
	Control	5(9.4)	3(5.7)	45(84.9)	2.07 ± (1.49)
Importance of Fluid Restrictions	Study	50(94.3)	3(5.7)	0(0)	4.62 ± (0.59)
	Control	1(1.9)	10(18.9)	42(79.2)	1.96 ± (**0**.73)
Importance of Diet Restrictions	Study	51(96.2)	2(3.8)	0(0)	4.67 ± (**0**.67)
	Control	5(9.4)	16(30.2)	32(60.4)	2.32 ± (**0**.99)
Highly/Very important =5 or 4; Moderately important=3; Little/Not important=1or2.					

Study group n=53; Control group n=53.

Table 3 presented perception categories toward the importance of hemodialysis, medicines, fluid and diet. The results show a significant improvement in the study group's perception categories at post-test trials by shifting the results from little or not important to a very or highly important level of score in the study group, while there was no shifting among responses of the control group in posttest responses.

Table (4): Difference (Mann-Whitney U-Test) Between the Study and Control Group Regarding Perception on the Importance of Adherence at the Post-Test Trials

Perception of the Importance of Adherence	Group	Mean Rank	Sum of Ranks	Mann-Whitney U	Z	p. value
Importance of HD Attendance	Study	79.66	4222	18.00	9.169	0.001
	Control	27.34	1449			
Importance of Medication	Study	62.89	3333	907.00	3.288	0.001
	Control	44.11	2338			
Importance of Fluid Restrictions	Study	79.53	4215	25.00	9.012	0.001
	Control	27.47	1456			
Importance of Diet Restrictions	Study	78.08	4138.50	101.50	8.536	0.001
	Control	28.92	1532.50			

Study group n=53; Control group n=53

Table 4 presents the variation in the study and control groups' post-test perceptions of the significance of adherence, including hemodialysis attendance, medication, fluid restriction, and diet restriction. At P < 0.001, the data indicate a statistically significant positive correlation.

Table (5): Correlations Between the Total Adherence Score and the Perceptions of Adherence at Post-test Trials for Study Group

Perceptions of Adherence	Statistical Parameters	Total Adherence Scores
Importance Degree of Following Dialysis Schedule	Spearman Correlation	0.768
	Sig. (2-tailed)	**0.001**
	n	53
Importance Degree of Taking Medicines as Scheduled	Spearman Correlation	0.332
	Sig. (2-tailed)	**0.001**
	n	53
Importance Degree of Limiting Fluid Intake	Spearman Correlation	0.779
	Sig. (2-tailed)	**0.001**
	n	53
Importance Degree of Monitoring Eaten Food Types Daily	Spearman Correlation	0.706
	Sig. (2-tailed)	**0.001**
	n	53

Table 5 highlight the importance of adherence to different aspects of the hemodialysis treatment regimen in improving patients' perceptions and overall treatment outcomes at post-test study group. These results shows that there is a statistical correlation between total adherence score to various aspects of the hemodialysis treatment regimen at P=0.001.

Discussion

The results of this study show in Table 2 and Table 3 that the perceived importance of hemodialysis attendance, medication management, fluid restrictions, and diet restrictions in the study group showed higher mean scores for post-intervention, shifting from little importance pre-test to high importance after implementing the instruction program compared to the control group. This suggests that the instructional program effectively

increased the participants' awareness of the significance of these treatment components.

These results are consistent with a Palestinian study evaluating patients' attitudes toward different hemodialysis treatment modes. Perception toward hemodialysis sessions obtained the highest score in the study by Naalweh et al., with 96.4% of patients reporting that adhering to the dialysis schedule is highly or very important. However, patients' views on the importance of watching what they eat daily were the lowest scoring, with only 77.7% of patients holding this view. Although 85.5% of patients rated medication adherence as highly important and 88.6% rated fluid restriction as very important, the impression of the relevance of these two factors was relatively fair [22]. Another study conducted by Raashid et al. in the Department of Nephrology in Pakistan found that the majority of patients were aware of the importance of different treatment adherence, with mean perception scores of 7.22 ± 1.37 [24].

Overall, the findings suggest that an improved understanding of the importance of specific aspects of treatment leads to better adherence and, consequently, better health outcomes for patients.

The study findings in Table 4 showed statistically significant differences between the study and control groups regarding the perception of the importance of adherence to different aspects of the hemodialysis treatment regimen among end-stage renal failure at (p=0.001). while the study group has the highest mean rank than the control group regarding hemodialysis attendance sessions, medication, diet, and fluid restriction, so the implementation of an instruction program is effective in improving patients' perception of the importance of adherence to different aspects among end-stage renal failure patients compared to the control group. A study in Isfahan, Iran, reported that applying training programs improves patients' perception regarding attendance at HD sessions, medication therapy, and fluid and dietary restrictions [25]. Another study conducted by Yang et al. showed that face-to-face training program had upgraded their perception and reported that patients

undergoing hemodialysis increased their clinical outcomes, quality of life, and patients' acceptance and satisfaction [26].

In this study, the results in Table 5 showed that there is a positive significant correlation between the total adherence score and the perceptions of adherence at post-test trials for the Study Group among end-stage renal failure patients at (P = 0.001), This finding consists with a cross-sectional study conducted in Iraq by Abdul-Jabbar and Kadhim they done their study on patients previously diagnosed with End Stage Renal Disease on hemodialysis and discovered a significant positive association between the total adherence score and the perceptions of the necessity of restricting fluid intake and monitoring food at (p=0.008) suggesting that better perception and attitude yields better adherence [27].

Patients' perception of the importance of adhering to treatment and medical recommendations greatly affects the actual degree of adherence. Therefore, these results can be relied upon in developing awareness programs to enhance treatment adherence and improve its results, supported by Saadatifar et al. [21].

Conclusions

The study concluded that the instruction program effectively improves end-stage renal failure patients' perceptions of their adherence to hemodialysis treatment

Recommendations

Due to the poor perception among end-stage renal failure patients about adherence to different treatment aspects, this study recommended providing an instruction program for end-stage renal disease applying during pre-hemodialysis time to enhance their knowledge and perception of adherence to hemodialysis.

Conflict of interest

The author declares that they have no conflict of interest.

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