

Adherence To Hemodialysis And Associated Factors Among Adult Patients Of End Stage Renal Disease

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Abstract

Background: End Stage Renal Disease (ESRD) is one of the major public health issues with profound consequences for people, families, and communities on a physiologic, psychological, and socioeconomic level. Around the world, ESRD affects over 850 million people. This is equivalent to 11–13% of the entire world's population.

Objective: To assess the level of adherence to hemodialysis among adult patients of End Stage Renal Disease and to explore the factors associated with adherence to hemodialysis among adult patients of End Stage Renal Disease.

Materials and Methods: A descriptive cross-sectional study was conducted. A random sampling technique was used. Data were gathered using the End Stage Renal Disease Adherence Questionnaire (ESRD-AQ). Statistical Package for the Social Sciences (SPSS) version 23 was used to analyze the data.

Results: The majority were aged 40-50 years (33.3%), female (66.7%), and married (70%). Educational levels varied, with 52% being illiterate. Half were employed, while common comorbidities included diabetes (40.7%) and heart disease (30%). Regarding adherence, only 18.6% followed medication guidelines, 42.7% adhered to hemodialysis treatment, 46.7% adhered to dietary restrictions, and 58.6% adhered to fluid intake recommendations. Significant associations were found between adherence and demographic factors, emphasizing the need for targeted interventions to improve patient outcomes.

Conclusion: Adherence to hemodialysis is a concern in Pakistan and continues to be a worldwide problem among patients with ESRD. Overall adherence to hemodialysis among ESRD patients is low. In this regard, continuous education and prompt communication is needed to increase the adherence attitude towards dialysis treatment. Focusing specifically on the identified predictors can help create beneficial policies that will greatly increase the degree of adherence. Nurses should promote hemodialysis adherence on behalf of patients with ESRD.

Keywords: Adherence; Hemodialysis; End Stage Renal Disease; Treatment; Fluid Restriction; Medication.

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Introduction

End Stage Renal Disease (ESRD) is one of the major public health issues that affects people's physical, emotional, and socioeconomic well-being as well as that of their families and communities (Mukakarangwa et al., 2018). End Stage Renal Disease (ESRD), which is caused by irreversible severe CKD and results in lifelong kidney function loss, has extremely high death rates in this population. Despite improvements in medical care and technology, it is still a severe, life-threatening condition with a very high death rate and poor quality of life (Jankowski et al., 2021).

ESRD affects almost 850 million individuals globally. This is equivalent to 11–13% of the entire world's population. According to the 2017 Global Burden of Disease research, renal illnesses are responsible for 1.2 million deaths worldwide, and between 1990 and 2017, the all-age mortality rate for chronic kidney disease increased by 41.5%, making it one of the leading causes of death worldwide (Antony et al., 2020).

Management of ESRD is multifaceted; three treatment modalities for ESRD including hemodialysis, peritoneal dialysis, and kidney transplant (Sousa et al., 2019). Kidney transplantation is the best option for people with ESRD. However, because to the scarcity of organ donors, hemodialysis (HD) became the most efficient and feasible therapy for managing patients. Around the world, There have been reports of rates of non-adherence to dialysis therapy ranging from 8.5% to 22.1%, and in one study, as high as 86%. An estimated 50% of HD patients do not follow their prescribed dialysis treatment plans. Additionally, rates of 7%-32% have been observed for not attending all dialysis sessions, which is a crucial sign of adherence to dialysis treatment (Dantas et al., 2019).

Adherence to dietary and hydration restrictions is essential for therapies to be effective; failure to do so might result in higher incidence of complications (and associated expenses) and lower survival. To lower the risk of morbidity and death in ESRD patients, dietary modifications are required for important nutrients, including carbohydrates, proteins, sodium, potassium, phosphorus, and fluid consumption. Limiting certain meals is crucial for hemodialysis patients in order to prevent the buildup of these metabolic wastes in the blood and the emergence of comorbidities including hypertension, proteinuria, and other health issues affecting the heart and bones (Mohamedi and Mosha, 2022).

Furthermore, dietary restrictions are advised in order to delay the risk of morbidity and death and stop the kidneys from losing their ability to function. However, more than 50% of the dialysis patients drank excessive amounts of phosphorus, salt, calcium, and potassium while also consuming an insufficient amount of most minerals. Evidence about food restrictions demonstrates that compliance is difficult for many ESRD patients, with more than half of adult ESRD patients failing to follow their dietary recommendations (Geldine et al., 2017).

Adherence to treatment regimens, including hemodialysis, offers numerous benefits to patients, healthcare providers, and healthcare organizations. For patients, adherence to hemodialysis treatment leads to improved overall health and well-being, including better management of symptoms associated with end-stage renal disease (ESRD), such as fatigue, fluid overload, and electrolyte imbalances. Adherence also helps to prevent complications and hospitalizations, reducing the risk of serious medical events and enhancing quality of life (Alzahrani and Al-Khattabi, 2021). Additionally, adherent patients may experience better long-term outcomes, including improved survival rates and reduced healthcare costs associated with complications and hospital admissions.

For healthcare providers and organizations, adherence to hemodialysis treatment contributes to more effective management of patient care. Adherent patients are more likely to achieve treatment goals, leading to better clinical outcomes and reduced healthcare utilization (Blumrosen et al., 2020). This can result in improved resource allocation and cost savings for healthcare organizations. Furthermore, adherence enhances patient-provider relationships and communication, fostering trust and collaboration in the delivery of care.

Research Objective

To assess the level of adherence to hemodialysis among adult patients of End Stage Renal Disease and to explore the factors associated with adherence to hemodialysis among adult patients of End Stage Renal Disease.

Materials and Methods

The study employed a descriptive cross-sectional design, providing a snapshot of the occurrence of ESRD and related characteristics within a defined population at a specific point in time. Conducted at the University of Health Sciences, Lahore, in collaboration with hemodialysis centers at Mayo Hospital, Jinnah Hospital, and Sheikh Zaid Hospital, this research targeted adult ESRD patients visiting these dialysis centers. The study spanned six months (July 2022 to December 2022) and involved a sample size of 150 patients, determined using a 95% confidence interval and a 10% margin of error. Probability simple random sampling was utilized to ensure each member of the target population had an equal chance of selection, enhancing the representativeness and validity of the study results. Data collection involved demographic questionnaires and the End Stage Renal Disease Adherence Questionnaire (ESRD-AQ), which measures treatment adherence across five dimensions. A pilot study confirmed the reliability of the tools, with a Cronbach's alpha value of 0.83. Ethical approval was secured from the University of Health Sciences and consent was obtained from all participants, ensuring adherence to ethical standards throughout the study.

Results

Table 1. Demographic Characteristics of the Respondents

Variable	Category	Frequency	percentage
Age	20-30 years	23	15.0%
	30-40 years	40	26.7%
	40-50 years	50	33.3%
	More than 50 years	37	24.7%
Gender	Male	50	33.3%
	Female	100	66.7%
Marital status	Married	105	70%
	Unmarried	45	30%
Education	Illiterate	78	52%
	Read and write	34	22.7%
	Secondary	22	14.7%
	Higher	16	10.0%
The work	I don't work	75	50
	I work	75	50
Other diseases you suffer from	Diabetes	61	40.7
	Blood pressure	34	22.7
	Heart disease	45	30
	Other	10	6.7

The period of dialysis	Year	44	29.3
	2-5 year	78	53
	More than 5 year	28	18.7

Table 1 provides a comprehensive overview of demographic characteristics among 150 respondents. The majority (33.3%) fell within the 40-50 age group, followed by 26.7% aged between 30-40 years, and 24.7% aged over 50 years. Females comprised the majority of respondents (66.7%), while males represented 33.3%. Additionally, a significant proportion (70%) of participants were married, with 30% being unmarried. Education levels varied, with 52% being illiterate, 22.7% able to read and write, 14.7% having secondary level education, and 10% possessing higher qualifications. Half of the participants (50%) were employed while the remaining did not work. Common comorbidities included Diabetes (40.7%), blood pressure issues (22.7%), Heart disease (30%), and other diseases (6.7%). In terms of dialysis duration, the majority (53%) had been on hemodialysis for 2-5 years, with 29.3% undergoing dialysis for 1 year.

Table 2. Adherence towards Hemodialysis

Hemodialysis component	Adherence n (%)	Non-Adherence n (%)
Medication	28 (18.6%)	122 (81.4%)
Fluid intake	88 (58.6%)	62 (41.4%)
Dietary restriction	70 (46.7%)	80 (53.3%)
Treatment	64 (42.7%)	86 (57.3%)

Table 2 comprehensively outlines the adherence and non-adherence of various components of hemodialysis. Specifically, 122 (81.4%) did not comply with medication guidelines. Similarly, 86(57.3%) were not adherent to treatment and 80(53.3) showed non-adherence towards dietary restriction and 64(41.4%)were non adherent to fluid intake. On the other hand, 28 individuals (18.6%) demonstrated adherence to medication and 88 (58.6%) adhered to fluid intake recommendations, 70 (46.7%) followed dietary restrictions, and 64 (42.7%) adhered to the prescribed hemodialysis treatment regimen. Understanding adherence rates to different aspects of hemodialysis is crucial for evaluating treatment effectiveness and identifying areas where interventions may be needed to improve patient outcomes and overall quality of care.

Table 3. Factors associated with Adherence to Hemodialysis among ESRD Patients

Demographic Characteristics	Adherence to hemodialysis Treatment		Adherence to Fluid Restriction		Adherence measures to Dietary intake		Adherence to Medication	
	X2 value	P value	X2 value	P value	X2 value	P value	X2 value	P value
Age	104.0	0.000	103.55	0.000	53.1	0.000	81.505	0.000
Gender	34.481	0.005	41.854	0.000	13.8	0.05	35.846	0.005
Marital status	44.470	0.000	40.292	0.000	33.2	0.000	45.703	0.000

Education	64.64	0.004	52.203	0.001	50.631	0.003	60.631	0.002
The Work								
Other diseases	60.203	0.001	53.00	0.003	30.203	0.002	40.203	0.004
The period of	82.001	0.000	42.707	0.001	42.007	0.000	72.00	0.001
dialysis	56.706	0.002	103.55	0.000	46.707	0.003	36.707	0.003

Table 3 presents the association of adherence to hemodialysis treatment with demographic factors among participants with end-stage renal disease (ESRD). The results demonstrate significant associations between adherence to hemodialysis treatment and various demographic characteristics, as indicated by p-values less than 0.05. Specifically, there is a significant association between fluid restriction and demographic factors ($p < 0.05$). Similarly, dietary intake adherence is significantly associated with demographic characteristics ($p < 0.05$). Additionally, the data show a significant association between adherence to medication and demographic characteristics ($p < 0.05$). These findings highlight the influence of demographic factors on different aspects of adherence to hemodialysis treatment among ESRD patients.

Discussion

In the current study, the majority of participants (33.35%) were aged between 40-50 years. This finding aligns with studies by Lal et al. (2019) and El-Deen and Mahmoud (2019), which also found most participants to be over 40 years old. Raashid et al. (2021) found an average age of 45.2 years, emphasizing the impact of CKD on individuals in their mid-forties. However, Blumrosen et al. (2020) reported a higher mean age of 53.3 years in Palestine, suggesting regional variations in CKD age distribution.

Regarding gender distribution, 66.7% of the respondents in the current study were female. This aligns with Mohamedi and Mosha (2022), who also found a majority of female participants. However, Suganthi et al. (2020) reported higher proportions of male ESRD patients. These variations highlight the complexity of ESRD epidemiology and the importance of considering gender-specific factors in diagnosis, treatment, and management.

The marital status of ESRD patients plays a significant role in their healthcare journey and treatment adherence. In the current study, 70% of respondents were married, suggesting that spousal support may positively impact treatment adherence. This observation aligns with findings from a study conducted in Pakistan.

The study also revealed that 52% of patients were illiterate and non-adherent to hemodialysis. Lower levels of education may hinder understanding and compliance with ESRD treatment. Conversely, participants with secondary-level education or higher demonstrated better comprehension and adherence to medical recommendations. This emphasizes the need for educational interventions targeting individuals with lower education levels to improve adherence to hemodialysis treatment.

Employment status varied among participants, with 50% employed and 50% unable to work. This finding contrasts with Antony et al. (2020), where the majority were not working. Hypertension and diabetes mellitus were common comorbidities, consistent with Sapkota et al. (2022), who reported about 46% of participants with hypertension.

The duration of dialysis treatment is crucial in influencing patient experiences and outcomes. In the present study, 53% of respondents reported undergoing dialysis for 2-5 years, consistent with Antony et al. (2020). However, variations in dialysis duration may exist across different patient cohorts and healthcare settings, highlighting the need for tailored patient care approaches.

Transport mode significantly impacts dialysis session attendance. In this study, 41.3% used public buses, and 19.3% used taxis. Public buses, while less expensive, may cause stress due to longer travel times compared to taxis. In contrast, Sapkota et al. (2022) found that 62% of respondents used taxis.

The current study highlights a concerning trend of medication non-adherence, with only 18.6% of respondents adhering to their regimens. This finding is consistent with Mohamedi and Mosha (2022) in Pakistan, indicating widespread non-adherence in the region. However, other studies report varying adherence rates. For example, in Egypt, Antony et al. (2020) found 67.77% adherence, and Abd El-Rasol and Aziz reported 51% adherence. These differences may be due to cultural attitudes, access to healthcare resources, and healthcare infrastructure. Similarly, Sapkota et al. (2022) in Nepal showed high adherence to dialysis instructions but varied adherence to medication, fluid, and dietary restrictions, underscoring the multifaceted nature of treatment adherence.

In terms of fluid restriction, 58.6% of respondents adhered, aligning with Raashid et al. (2021), who reported 48.51% adherence. Dietary adherence was observed in 46.7% of respondents, contrasting with high non-adherence rates in studies by Mohammed Mousa et al. (2020).

Dialysis treatment adherence was observed in 42.7% of respondents, which is lower than the 50% adherence reported by Sousa et al. (2019) but higher than the 7% adherence noted by Mukakarangwa et al. (2020) in Africa. The varying adherence rates highlight the need for tailored interventions to address barriers and improve compliance.

Skipping dialysis sessions varied significantly by region, with rates ranging from 0.3% in France to 12.6% in the UK. Dialysis session shortening affected 26.7% of participants in the current study, primarily due to technical issues, similar to findings by Kilonzo et al. (2021) in Kenya, where 62% of patients were non-adherent to hemodialysis sessions.

In term of dietary intake adherence association with demographic characteristics, the present study revealed significant association between demographic characteristics and adherence to dietary intake among ESRD patients. This finding is align with Alzaharani and Al-Khattabi (2021) who underscores the significant association between adherence to dietary intake and age, gender, marital status and education. Moreover, Mukakarangwa et al. (2018) also reported association between adherence to dietary intake and age, religion.

Regarding medication adherence association with demographic characteristics, the present study revealed significant association between demographic characteristics and adherence to medication among ESRD patients. These findings are consistent with Blumrosen et al. (2020), who reported a significant association between age, gender, marital status and medication adherence.

Conclusion

Adherence to hemodialysis is a major concern in Pakistan and continues to be a worldwide problem among patients with ESRD. Within this study cohort, varying levels of adherence were observed, with some patients compliant with medication while others adhered to fluid restrictions. Dietary and medication therapy adherence also varied among participants. Analysis revealed statistically significant associations between demographic characteristics such as age, gender, education, and adherence to hemodialysis. In conclusion, there is an urgent need for continuous education and robust communication strategies to strengthen adherence to dialysis treatment. Developing tailored strategies focusing on identified predictors is crucial to improving adherence rates. Nurses, as advocates for ESRD patients, have a pivotal role in promoting adherence to hemodialysis protocols.

Recommendations

- Nurses should enhance evidence-based practice, communication, and education with ESRD patients to emphasize the importance of hemodialysis adherence, as non-adherence negatively impacts quality of life and mortality rates.
- Continuous education in nephrology for nurses is essential to improve patient care and outcomes by expanding the pool of specialized nurses.
- Nurses should engage in urgent research on hemodialysis adherence and its associated variables among ESRD patients.
- Nursing administration should develop policies that address the burden and effects of non-adherence to hemodialysis, aiming for better and sustainable solutions.

Limitations

- Time and resource constraints, including limited observation periods to meet master's degree requirements and lack of funding, restricted expert involvement and study resources.
- Logistical and methodological challenges, such as delays in obtaining ethical permissions, rushed data collection, a cross-sectional study design, and the need for a larger sample size to validate findings in more detail.

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