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Hemodialysis Patients' Knowledge and Attitudes Regarding Arteriovenous Fistula Care in Baghdad

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ABSTRACT

Objective: This study aimed to assess hemodialysis patients' knowledge and attitudes regarding arteriovenous fistula (AVF) and to examine their associations with selected sociodemographic and clinical characteristics in Baghdad, Iraq.

Methods and Materials: A descriptive cross-sectional design was used with a purposive sample of 150 patients undergoing hemodialysis in three teaching hospitals in Baghdad (Al-Kindi, Baghdad Teaching/Medical City, and Al-Karama). Data were collected through face-to-face interviews using a structured questionnaire that included demographic and clinical variables, 10 items on AVF knowledge, and 10 items on AVF-related attitudes. Knowledge and attitude scores were categorised as low/poor, fair/moderate, or good/high. Data were analysed using SPSS version 21, with descriptive statistics, one-way ANOVA, and Pearson correlation; p-values ≤ 0.05 were considered statistically significant.

Findings: 34.7% of patients had poor knowledge, 45.3% had fair knowledge, and 20.0% had good knowledge of AVF, with most individual items rated at a fair level. In contrast, 60.0% of patients showed low attitudes, 33.3% moderate attitudes, and only 6.7% high attitudes toward AVF care. Knowledge scores differed significantly between hospitals, with patients at Baghdad Teaching Hospital demonstrating higher knowledge than those at Al-Kindi and Al-Karama. Knowledge was significantly associated with age, marital status, and duration of kidney disease, whereas no significant associations were found between attitudes and socio-demographic or clinical variables. Knowledge and attitudes were not significantly correlated.

Conclusion: Hemodialysis patients in Baghdad demonstrate fair knowledge but predominantly low attitudes regarding AVF care, highlighting the need for nurse-led educational interventions.

Keywords: hemodialysis, arteriovenous fistula, knowledge, attitudes, Iraq.

Introduction

Chronic kidney disease (CKD) is considered irreversible damage to kidney structure or function that persists for over 3 months (Kim et al., 2024). On the other hand ,hemodialysis is an effective treatment for patients with end-stage renal disease (ESRD). It can significantly improve their quality of life and prolong their survival (Pasyar et al., 2025). Educational programs are essential to enable hemodialysis patients to care for themselves (Fadlalmola & Elkareem, 2020). During clinical practice, it was noted that patients lacked information and, in turn, knowledge regarding the care of arteriovenous fistulas (Ray et al., 2021). Patients undergoing hemodialysis who demonstrate high levels of (AVF) knowledge and self-care tend to maintain patency in their vascular access (Bulbul et al., 2025). Many health education interventions for hemodialysis patients have been implemented, covering topics such as physical exercise, medication adherence, and nutrition (Ouirdani et al., 2024). Moreover ,patients should be trained to perform specific care for their AVF, with a focus on maintaining the access (İkiz et al., 2021). Several vascular access guidelines recommend that nurses teach patients to care for their own AVF (Ray et al., 2021). When patients have good knowledge of self-care behaviors for AVF, they are likely to be more skilled at avoiding situations that compromise vascular access (İkiz et al., 2021).

Methods and Materials

A descriptive design, purposive (non-probability) sample of 150 patients was selected to assess their knowledge and attitude related to arteriovenous fistula while they are making hemodialysis at Fadlalmola & Elkareem (2020) teaching hospitals in Baghdad city (Al-Kindi Teaching Hospital, Baghdad Teaching Hospital/Medical City, and Al Karama Teaching Hospital.((50) patients from each hospital. The data were gathered from March 15 to April 30, 2025. A designed questionnaire was used to collect data by directly questioning patients, including demographic data, clinical characteristics, knowledge, and attitude items regarding arteriovenous fistula. A question format was used for data collection, which consists of three parts.

Part 1: This part concerns demographic characteristics, including the items from Bulbul et al. (2025) (gender, age, level of education, marital status, and employment status); Part 2: This part concerned the clinical characteristics of patients, including the items from Bulbul et al. (2025) (duration of hemodialysis, number of dialysis sessions per week, smoking status, alcohol drinking, and hospitals); Part 3: This part concerns patients' knowledge and attitude (Amarasinghe et al., 2022) toward arteriovenous fistula.

Statistical Analysis

SPSS version 21 was used to evaluate Frequency, percentage, mean score, standard deviation, Pearson correlation, and probability of the variable quantity.

Findings and Results

A total of 150 hemodialysis patients participated in the study. The largest proportion of patients (28.7%) was aged 60–69 years, and more than half were male (56.7%). Almost one quarter (24.0%) were institute graduates, and 69.3% were married. Regarding clinical characteristics, 60.7% had a disease duration of 1–5 years, and 50.7% received hemodialysis three times per week. Most patients were non-smokers or former smokers, and only 6.7% reported current alcohol consumption. Patients were recruited in equal proportions from the three teaching hospitals in Baghdad.

Table 1

Overall levels of patients' knowledge and attitudes about arteriovenous fistula (AVF) care (n = 150)

Variable	Level	n	%	Score range
Knowledge	Poor	52	34.7	10.00–16.66
	Fair	68	45.3	16.67–23.33
	Good	30	20.0	23.34–30.00
Attitudes	Low	90	60.0	10.00–16.66
	Moderate	50	33.3	16.67–23.33
	High	10	6.7	23.34–30.00

Overall, patients demonstrated fair knowledge but predominantly low attitudes regarding AVF care (Table 1). While 45.3% of patients had a fair level of knowledge, 34.7% had poor knowledge, and only 20.0% had good knowledge. In contrast, 60.0% of patients reported low attitudes toward AVF care, 33.3% moderate attitudes, and just 6.7% high attitudes. The mean total knowledge score was 19.04 (SD = 4.87), and the mean attitude score was 16.58 (SD = 3.86) on a scale ranging from 10 to 30.

Table 2

Item-wise assessment of patients' knowledge about AVF care (n = 150)

Item no.	Knowledge item	Mean	SD	Level*
1	The patient needs to become familiar with their AVF so they can detect slight changes.	1.63	0.79	Poor
2	Thrombosis, stenosis, and infection are the three most prevalent complications of AVFs for dialysis.	2.07	0.80	Fair
3	AVF takes approximately one to four months to heal and mature before it can be used for hemodialysis.	2.00	0.86	Fair
4	Cold or numb skin in the AVF arm indicates ischemia of the arm.	2.24	0.87	Fair
5	Bruising can happen in the AVF arm if the arm is moved too much during hemodialysis.	1.79	0.85	Fair
6	An upper-limb exercise program may facilitate AVF maturation and maintenance.	1.80	0.80	Fair
7	Any pain in the fistula area should be reported to the doctor immediately.	1.66	0.82	Poor
8	The caps and clamps of the dialysis catheter should be kept tightly closed when not in use.	1.92	0.86	Fair
9	Avoiding trauma to the arm is essential for AVF safety.	1.91	0.84	Fair
10	No creams or lotions should be used on the AVF site unless approved by the doctor.	2.01	0.89	Fair

**Response options: 1–3; Poor = 1.00–1.66; Fair = 1.67–2.33; Good = 2.34–3.00.*

Item-wise analysis showed that most knowledge items were rated as fair (Table 2). Patients were relatively more informed about common AVF complications, maturation time, signs of ischemia, and the importance of avoiding trauma and inappropriate creams at the access site. However, knowledge was limited regarding the need to be familiar with the AVF to detect subtle changes and to immediately report any pain in the fistula area, indicating gaps in early recognition and timely help-seeking.

Table 3

Item-wise assessment of patients' attitudes toward AVF care (n = 150)

Item no.	Attitude item	Mean	SD	Level*
1	Bleeding is very uncommon; if it occurs, immediate compression should be applied to the bleeding area.	1.71	0.81	Moderate
2	The patient should examine the fistula daily for redness, swelling, or pain.	2.03	0.79	Moderate
3	The limb should be washed with soap and water before hemodialysis.	1.89	0.82	Moderate
4	Hand hygiene should be performed before assessing or touching the vascular access.	1.59	0.81	Low
5	Blood pressure measurements should be avoided in the fistula arm.	1.43	0.75	Low
6	Blood collection and cannulation should be avoided in the fistula arm.	1.37	0.68	Low
7	Wearing a watch or tight clothing on the fistula arm should be avoided.	1.35	0.66	Low
8	Lifting heavy objects with the fistula arm should be avoided.	1.53	0.76	Low
9	Prolonged bending of the fistula arm should be avoided.	1.77	0.77	Moderate
10	The patient should avoid resting the head on the fistula arm.	1.89	0.85	Moderate

**Response options: 1–3; Low = 1.00–1.66; Moderate = 1.67–2.33; High = 2.34–3.00.*

As shown in Table 3, attitudes toward AVF care ranged from low to moderate. Moderate attitudes were observed for daily inspection of the fistula, washing the limb before dialysis, and avoiding prolonged bending or resting on the access arm. Conversely, attitudes were low for several critical protective behaviours, including hand hygiene before touching the access, and avoiding blood pressure measurement, venipuncture, tight clothing, and heavy lifting in the fistula arm.

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Table 4

Differences in knowledge and attitudes about AVF care by hospital (n = 150)

Variable	Source of variation	Sum of squares	df	Mean square	F	p value
Knowledge	Between hospitals	1351.00	2	675.50	45.45	0.001
	Within hospitals	2184.76	147	14.86		
	Total	3535.76	149			
Attitudes	Between hospitals	55.72	2	27.86	1.89	0.154
	Within hospitals	2162.82	147	14.71		
	Total	2218.54	149			

Post-hoc comparisons of knowledge indicated that patients at Baghdad Teaching Hospital had significantly higher knowledge scores than those at Al-Kindi and Al-Karama Teaching Hospitals, and that patients at Al-Karama had higher knowledge scores than those at Al-Kindi (all p < 0.01). No significant differences in attitudes were observed between hospitals.

There was a highly significant difference in knowledge scores between hospitals (F(2,147) = 45.45, p = 0.001), whereas attitudes did not differ significantly by hospital (F(2,147) = 1.89, p = 0.154) (Table 4). Post-hoc tests indicated that patients at Baghdad Teaching Hospital had significantly higher knowledge scores than those at Al-Kindi and Al-Karama Teaching Hospitals, and that patients at Al-Karama also had higher knowledge scores than those at Al-Kindi. No significant pairwise differences were observed for attitudes.

Table 5

Associations of knowledge and attitudes about AVF care with socio-demographic and clinical characteristics (n = 150)

Variable	Knowledge r	Knowledge p	Sig.	Attitudes r	Attitudes p	Sig.
Age (years)	0.191	0.020	S	0.150	0.066	NS
Sex	0.159	0.052	NS	0.058	0.478	NS
Level of education	0.113	0.167	NS	0.082	0.319	NS
Marital status	0.178	0.029	S	0.103	0.210	NS
Employment status	0.053	0.519	NS	0.084	0.308	NS
Duration of kidney disease	0.184	0.025	S	0.035	0.672	NS
Number of dialysis sessions/week	0.099	0.228	NS	0.107	0.192	NS

S = Significant (p ≤ 0.05); NS = Not significant.
There was no significant correlation between overall knowledge and attitudes (r = 0.089, p = 0.276; not shown in the table).

As summarized in Table 5, knowledge scores were significantly associated with age (r = 0.191, p = 0.020), marital status (r = 0.178, p = 0.029), and duration of kidney disease (r = 0.184, p = 0.025), such that older, married patients and those with a more extended history of kidney disease tended to have slightly higher knowledge levels. No significant associations were found between knowledge and sex, education level, employment status, or number of dialysis sessions per week. Regarding attitudes, none of the socio-demographic or clinical variables showed a statistically significant association (p>0.05). Furthermore, overall knowledge and attitude scores were not significantly correlated (r = 0.089, p = 0.276), suggesting that greater knowledge did not necessarily correspond to more favourable attitudes toward AVF care in this sample.

Discussion and Conclusion

The present study indicated that the highest percentage of patients fell within the age range of (60 – 69) years, (56.7%) of them were males, (24%) were institute graduates, (69.3%) of patients were married, and (33.3%) of patients were homemakers. Huang et al. (2025) reported that the majority of participants were men (55.56%), aged 46–60 years (43.10%), and married (83.14%). Our study indicated that (60.7%) of patients have a 1-5 year duration of disease, and (50.7%) have three dialyses per week. (22.7%) of patients are current smokers, while (48%) have never smoked. Only 6.7% of patients are current alcohol users.

Amarasinghe et al. (2022) found that 2/3 of respondents had been on hemodialysis for more than 1 year, and most participants (95%) received hemodialysis twice a week, with the remaining 5% receiving it 1 or 3 times per week. Our results showed that patients have a fair level of knowledge about arteriovenous fistula, as reported among 45.3% of them. This result is inconsistent with Amarasinghe et al.

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(2022), who reported that the majority of the patients (88.1%) had good knowledge, while 11.9% had average knowledge, and none had poor knowledge. Our study indicated that patients have a fair level of knowledge about arteriovenous fistula for most items. This result agrees with Pal (2021), who reported that the majority (94%) of the patients had inadequate knowledge, and 6%) of them had moderately adequate knowledge regarding self-care of arteriovenous (AV) fistula.

Our study indicated that patients have a low level of attitudes toward arteriovenous fistula, as reported among 60% of them.

This result disagrees with Iqbal et al. (2018), who reported that, in most participants, the attitude towards (AVF) care was positive. Our study reveals that patients have low to moderate attitudes toward arteriovenous fistula as indicated by mean scores. This was disputed by Bulbul et al. (2025), who reported that self-care (AVFs) was high (59.5%).

At the same time, the individuals' self-care behaviors were mainly classified as high-level. Our study indicated significant associations among patients' knowledge and their age, marital status, and disease duration (p-values of .020, .029, and .025, respectively). This was in disagreement with a study by Ray et al. (2021), which found no association with the selected demographic characteristics, as all the chi-square values are above the 0.05 level of significance. Our study found no significant association between patients' attitudes and their socio-demographic characteristics. Also, Sousa et al. (2020) indicated that moderate self-care mainly consists of male patients, with higher education level, employed, with shorter dialysis vintage, and with lower (AVF) duration. However, the high self-care mainly consists of female patients, with a lower education level, retired, with longer dialysis vintage, and with higher (AVF) duration.

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Declaration of Interest

The authors of this article declared no conflict of interest.

Ethical Considerations

The study protocol adhered to the principles outlined in the Helsinki Declaration, which provides guidelines for ethical research involving human participants. Ethical considerations in this study included the fact that participation was entirely optional.

Transparency of Data

In accordance with the principles of transparency and open research, we declare that all data and materials used in this study are available upon request.

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Authors' Contributions

All authors equally contribute to this study.

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