Patient Preferences and Information Gaps Underlying the Predominance of Hemodialysis in Türkiye: A Cross-Sectional Survey of 1908 Patients

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Introduction. Chronic kidney disease (CKD) is an important public health problem that is increasingly prevalent in Türkiye and the world. Patients with CKD should be informed about renal replacement therapy (RRT) before progression to end-stage kidney disease, and the most appropriate therapy should be selected for each patient. Although three different renal replacement therapy modalities exists, hemodialysis appears to be the most commonly chosen. In this study, we aimed to investigate why hemodialysis is often selected as the first-line therapy by patients.

Methods. In this cross-sectional, survey study; patients aged 18-80, who had been receiving treatment for more than three months and had initiated hemodialysis as their first RRT between 2010 and 2020 in Kahramanmaras, Kocaeli, and Istanbul were included. Patients completed a self-administered multiple-choice questionnarire.

Results. A total of 1908 patients were included in the study. Before initiating hemodialysis, 61.1% of patients were under nephrology follow-up, whereas 38.3% had no prior follow-up. Alternative therapies to hemodialysis (peritoneal dialysis and kidney transplantation) were explained to 720 patients (37.7%), but not to 1,159 patients (60.7%). A total of 635 patients (33.3%) were asked about their treatment preferences, while 66% were not. After hemodialysis initiation, 937 patients (49.1%) were listed for cadaveric kidney transplantation, wheras 49.5% were not.

Conclusion. Our study is a large, cross-sectional investigation of 1908 patients who selected hemodialysis as their initial RRT. The reasons patients choose hemodialysis over other modalities have long been debated, and substantial knowledge gaps among patients have been identified. We believe that nephrologist follow-up and patient information are important in choosing renal replacement therapy.

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INTRODUCTION

Chronic kidney disease (CKD) is a disorder characterized by chronic, progressive, and irreversible nephron loss, often secondary to diabetes mellitus. Patients with CKD should be informed about renal replacement therapy (RRT) before progression to end-stage kidney disease (ESKD), and the most appropriate treatment for each patient should be selected through a collaborative effort between the patient and physician.[1,2]

Kidney transplantation is the best option for ESKD due to its survival benefit compared to long-term dialysis. However, the most commonly used RRT in Türkiye is hemodialysis (HD), the second is kidney transplantation, and the last one is peritoneal dialysis (PD).[3]

HD is a treatment that has saved over a million people worldwide. PD, however, is less commonly used,while it offers several advantages over standard HD. In some studies, PD remains an alternative treatment due to its relative ease of use and lower cost compared to HD. While intermittent HD has been reported to be more costly than PD in developed countries, intermittent HD may be more cost-effective than PD in developing countries.[2]

Therapies for patients with ESKD vary depending on the socio-economic condition, health policies, and cultural factors of each country. According to the 2019 Global Kidney Health Atlas (GKHA) data of the International Society of Nephrology (ISN), while more than two million people worldwide have access to RRT, a similar number of patients do not. In Asia and Africa, only 17-34% of patients needing RRT received it. It is predicted that the number of patients needing RRT will double by 2030, and the greatest need is expected to be in Asia.[4,5]

In India, the world's second most populous country, 61% of patients with ESKD do not receive RRT, among those who do, 32% receive HD and 5% receive PD.[6] While HD is the most common type of RRT globally, some countries rely heavily on PD-for example, in HongKong, 71% of dialysis patients receive PD.[7]

According to the 2022 registry data of the Turkish Society of Nephrology, a total of 86,665 patients are receiving RRT in our country; of these, 61,723 (71.22%) receive HD, and 3,552 (4.1%) receive PD. In 2022, the incidence of ESKD requiring RRT in Türkiye was calculated as 160.9 per million population (pmp). The annual incidence was higher in men (190.6 pmp) than in women (131.2 pmp) and increased with age. The annual incidence of ESKD requiring RRT was 121.2 pmp for HD and 16 pmp for PD.[3]

Several factors may explain why HD is the most widely used RRT worldwide. Key contributors include Greater invetment in the HD sector, limited patient education regarding ESRD, and inadequate counseling time by nephrologists.

The reasons for the predominance of HD in Türkiye remain unclear. Is it primarily patients choice? To date, no studies have addressed this question. In the present study, we examine how HD is initiated, the underlying reaons for its selection, and whether patients were informed about alternative RRT modalities, focusing on a large cohort of patients who began RRT with HD in Türkiye.

MATHERIALS AND METHODS

This is a multicenter, non-invasive, cross-sectional survey study. Patients aged 18-80 years who had initiated HD as their first RRT within the past 10 years in the provinces of Kahramanmaraş, Kocaeli, and Istanbul, who consented to complete the questionnaire, and who had been receiving treatment for more than three months were included (Figure). Ethical approval was obtained from the Kahramanmaraş Sütçü İmam University, Faculty of Medicine Ethics Committee on 10 October 2023 (session 2023/16, decision no: 2)

Demographic and laboratory data of the patients were obtained from the patient files' and a multiple-choice survey was administered. All survey

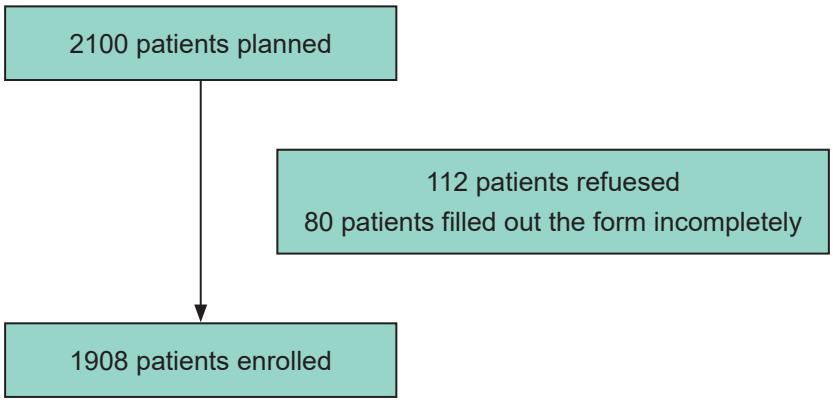

Figure. Flow diagram of the study.

questions were developed by the investigators. A questionnaire containing these items was distributed to patients, who were asked to complete it; illiterate patients received assistance as needed. The main questions in the survey were:

Statistical Analysis

Data were analyzed using SPSS version 27.0. Continuous variables obtained by measurement were presented as mean ± standard deviation (SD), while categorical variables obtained by counting were presented as frequencies and percentages.

RESULTS

A total of 1908 ESKD patients who had initiated dialysis within the last 10 years and had been receiving chronic HD for more than three months were included. Of these, 1094 were male (57.3%) and 814 were female (46.7%). The mean age of the patients was 60.5 ± 13.4 years. The etiologies of CKD were diabetes mellitus (34.5%), hypertension (32.1%), chronic glomerulonephritis (1.7%), and other causes and unknown (31.7%).

Considering patients' educational status, 949 (49.7%) were primary school graduates, 206 (10.8%) secondary school graduates, 229 (12%) high school graduates, 135 (7.1%) university graduates, and 362 (19%) were illiterate.

The mean duration of HD was 48.7 ± 42.3 months. HD was performed via an arterio-venous fistula

1. Educational status:
   Illiterate ( ) Primary school ( ) Secondary school ( ) High school ( ) University ( )
2. Is there a Nephrology follow-up before starting dialysis?
   Yes ( ) No ( )
3. If yes, how long is the period? (Months):
4. Have other therapies (Peritoneal dialysis and Transplantation) been explained to the patient before hemodialysis?
   Yes ( ) No ( )
5. Have these therapies been demonstrated to the patient live or visually?
   Yes ( ) No ( )
6. Has the patient's therapy preference been asked?
   Yes ( ) No ( )
7. If no, would he/she have preferred a different therapy if he/she had been told?
   Yes ( ) No ( )
8. If the answer is yes, which one would it be?
   PD ( ) Tx ( )
9. Is the patient's hemodialysis procedure urgent or planned?
   Urgent () Planned ( )
10. Did those who were started on emergency hemodialysis refuse preparation and choose to wait, even though dialysis preparation was previously recommended?
    Yes ( ) No ( )
11. Has the A-V fistula been created before dialysis?
    Yes ( ) No ( )
12. If yes, was the fistula waiting for maturation? Or did a catheter have to be inserted?
    Waited ( ) Catheter inserted ( )
13. Is there a living kidney donor candidate for this patient who is undergoing hemodialysis?
    Yes ( ) No ( )
14. Is the patient included in the cadaveric transplantation list after starting dialysis?
    Yes ( ) No ( )
15. Has peritoneal dialysis been explained to him/her in detail?
    Yes ( ) No ( )
16. If it was explained and he/she did not accept it, what was the reason?
    Anxiety of infection and other reasons ( )
    Lack of knowledge - inability to understand how to do it ( )
    Laziness ( )
17. Have you ever seen a patient who underwent peritoneal dialysis or had a kidney transplantation?
    Yes ( ) No ( )
18. Has anyone around you had good or bad experiences with peritoneal dialysis or kidney transplantation?
    Yes ( ) No ( )
19. Were the experiences of the patients he/she saw before effective in his/her choice of hemodialysis?
    Yes ( ) No ( )
20. Have people who have no experience or knowledge about dialysis made statements that would be effective in choosing hemodialysis?
    Yes ( ) No ( )
21. Which one is the most effective in choosing hemodialysis?
    Nephrology doctor ( ) Family ( ) Circle ( ) Internet ( )

in 1535 patients (80.5%) and via catheters in 367 patients (19.5%). Regarding hepatitis status, 1812 patients (94.9%) were negative for hepatitis B and C, 68 (3.6%) had hepatitis B, and 28 (1.5%) had hepatitis C (Table 1).

While 61.1% of the patients were under nephrology follow-up before initiating HD, 38.3% had no such follow-up. The mean duration of follow-up by a nephrologist before initiation of dialysis was 50 ± 52 months.

Alternative therapies to HD (PD and kidney transplantation) had been explained to 720 patients (37.7%) but not to 1,159 (60.7%). These therapy options had been demonstrated in detain on-site to 446 patients (23.4%) but not to 1,436 (76.6%). A total of 635 patients (33.3%) were asked about their RRT preferences, whereas 1,259 (66%) were not.

Table 1. General characteristics of patients participating in the study

Variables	
Age (years)	60.5 ± 13.4
Gender (n-%)	
Female	814 (%46.7)
Male	1094 (%57.3)
Educational Status (n-%)	
Primary school	949 (%49.7)
Secondary school	206 (%10.8)
High school	229 (%12)
University	135 (%7.1)
Illiterate	362 (%19)
HD Duration (months)	48.7 ± 42.3
Vascular access (n-%)	
A-V fistula	1535 (%80.5)
Tunneled-Catheter	367 (%19.5)
Hepatitis (n-%)	
Negative	1786 (%93.6)
Hepatitis B	68 (%3.6)
Hepatitis C	28 (%1.5)
Nephrologist follow-up before HD (months)	50 ± 52
PD-Kidney Transplantation (n-%)	
Informed	720 (%37.7)
Uninformed	1159 (%60.7)
Therapy preference (n-%)	
Asked	635 (%33.3)
Not asked	1259 (%66)
Reason for not accepting PD (%)	
Anxiety	51.2
Lack of information	38.8
Thinking it's hard	9.9
Factors affecting HD selection (n-%)	
Nephrologist	1469 (%77.7)
Family	111 (%5.8)
Neighborhood	31 (%1.6)
Internet	6 (%0.3)

HD: Hemodialysis, PD: Peritoneal Dialysis

Among patients who were not asked about their RRT preferences, 24% stated that they would have chosen a different therapy if consulted; of these 16.5% indicated they would choose PD, while 83.5% reported that kidney transplantation might have been their choice. Regarding HD initiation, 1,117 patients (58.5%) started dialysis urgently, whereas 767 (41.5%) began HD in a planned manner.

An arteriovenous (A-V) fistula was created prior to HD initiation in 720 patients (37.7%), whereas 1,163 patients (61%) did not have a fistula. Among patients with A-V fistulas, 35.8% waited for maturation, while 64.1% required catheter use and HD was initiated before fistula maturation.

Of the patients receiving HD, 320 (16.8%) had donors candidates for living kidneytransplantation, whereas 1,572 (82.4%) had none. Following HD initiation, 937 patients (49.1%) were listed for cadaveric kidney transplantation, whereas 944 (49.5%) were not.

PD was explained in detail to 662 patients (34.7%), but not to 1,225 (64.2%). A total of 713 patients reported some information of PD procedures, whereas 1,166 (61.1%) stated that they had no information. Regarding reasons for PD refusal, 51.2% cited anxiety, 38.8% lack of knowledge, and 9.9% reluctance.

Exposure to other patients with PD or kidney transplantation was limited: 535 patients (28%) reported having seen such patients, while 1,333 (72%) had not (Table 2). Only 398 patients (20.9%) indicated that people around them had prior experiences with PD or transplantation, whereas 1,494 (78.3%) had no such exposure. Similarly, 352 patients (18.4%) reported that these experiences impacted their choice of HD, while 1,539 (81.6%) reported no impact. A total of 215 patients (11.3%) indicated that people without experience or knowledge about dialysis influenced their decision, whereas 1,404 (73.6%) reported no influence.

Finally, 1,469 patients (77%) stated that the nephrologist was the most influential factor in choosing HD, followed by family (111; 5.8%), neighborhood (31; 1.6%), and the internet (6; 0.3%).

DISCUSSION

This is the first survey conducted in Türkiye with a large cohort of 1,908 patients, revealing that patients had insufficient information

Table 2. Some important questions in the survey, answers and percentages

	Yes (%)	No (%)
Is there a Nephrology follow-up before starting dialysis?	61.1	38.3
Have these therapies been demonstrated to the patient live or visually?	23.4	76.6
If no, would he/she have preferred a different therapy if he/she had been told?	24	76
Is the patient's HD procedure urgent?	58.5	41.5
Did those who were started on emergency HD refuse preparation and choose to wait, even though dialysis preparation was previously recommended?	18	82
Was the A-V fistula created before dialysis?	37.7	61
If yes, was the fistula waiting for maturation?	35.9	64.1
Is there a living kidney donor candidate for this patient who is undergoing HD?	16.8	82.4
Is the patient included in the cadaveric transplantation list after starting dialysis?	49.1	49.5
Has PD been explained to her in detail?	34.7	64.2
Have you ever seen a patient on PD or a kidney transplantation?	28	72
Has anyone around you had good or bad experiences with PD or kidney transplantation?	20.9	78.3
Were the experiences of the patients he/she saw around him/her influential in his/her choice of HD?	18.4	81.6
Have people who have no experience or knowledge about HD made statements that would be effective in choosing HD?	13.3	86.7

HD: Hemodialysis, PD: Peritoneal Dialysis

about RRT, and nearly 40% of patients with ESKD did not have any nephrology follow-up. Family physicians and internists bear significant responsibility in this regard; every CKD patient who has progressed to Stage 4 should be referred to a nephrologist. All three RRT modalities should be explained to the patient by a nephrologist, and the treatment plan should be individualized, taking into account the patient's level of education, comorbidities, lifestyle, and hygiene conditions. The most appropriate treatment decision should be made collaboratively between the patient and the physician. Unfortunately, in Türkiye, this is often not feasible due to the high workload of physicians, the large number of patients presenting to outpatient clinics, difficulties in accessing a nephrologist, or patients' unawareness of their condition and insufficient attention to their care.

Seventy-six percent of the patients participating in the survey reported that they were not informed about therapies other than HD, which is a notably high proportion. Therefore, physicians should devote more time to their patients and provide comprehensive information about RRT. Among patients who were not informed about alternative therapies, 24% stated that they would have chosen a different modality if they had been aware of the options, which were primarily kidney transplantation; moreover, 80% of these patients were waiting for cadaveric kidney transplantation. However, survey results indicate that only approximately half of the patients are actually listed for cadaveric transplantation, suggesting a lack of patient knowledge on this issue. At this point, dialysis physicians and nurses bear responsibility, and further education is particularly needed for patients in peripheral dialysis centers. On the other hand, organ donation rates in Türkiye are very low, highlighting the need for improvement. Kidney transplantation remains the most effective treatment option for patients with ESKD in terms of both quality of life and cost.

Sixty-one percent of patients evaluated in the outpatient clinic and planned for dialysis either did not have an A-V fistula created or required urgent dialysis before the fistula had matured. Unfortunately, the majority of patients are reluctant to undergo dialysis, have difficulty accepting the disease, and may even believe that dialysis could worsen their condition. Dialysis initiation is often delayed, and unfortunately, 60% of patients require urgent dialysis. These findings indicate that patients lack adequate information regarding this issue.

Sixty-four percent of patients participating in the survey reported that they had not been informed about PD and had not even met any patients undergoing PD in their surroundings. Nationwide, PD remains underutilized, as investments continue to favor HD, both in terms of government reimbursement and private center funding. Patients frequently observe numerous dialysis centers and HD patients, and the widespread availability of HD may discourage them from considering PD, a less familiar treatment (51.2%).

At the societal level, alternative treatments to HD are available at very low rates (approximately 20%), due to patients' living environments, limited access to health services, and misinformation. Although the majority of patients (80%) reported that their surroundings did not influence their treatment choice, physicians recognize that the environment significantly affects both outpatient follow-ups and dialysis decisions. Therefore, we believe that not only patients but also the general population should receive more education through social media, television programs, and other media channels.

Providing education to support RRT decision-making is a crucial component in CKD management; however, patients frequently report inadequate satisfaction with the dialysis modality selection process. Standardized comprehensive RRT training programs through multidisciplinary healthcare teams may help optimize CKD patient education and shared decision-making processes.[8] Financial incentives for physicians tied to HD procedures may represent an obstacle to guiding patients toward alternative RRT modalities.

The limitations of our study include the use of survey questions specifically developed for this topic, selection bias (regional rather than national), and reliance on descriptive statistics.

CONCLUSION

In conclusion, CKD is a significant heatlh issue in Türkiye and worldwide, with increasing prevalence. It is crucial for nephrologists to provide patients with detailed information and education regarding the selection of ESKD treatments.

CONFLICT OF INTEREST

The authors declare that they have no conflict of interest.

FINANCIAL DISCLOSURE

No financial support was received from any organization for this study.

ETHICS APPROVAL

Ethics committee of the KSU Faculty of Medicine Ethics Committee, on 10.10.2023, in the 2023/16 session, with decision number 02.

AUTHOR CONTRIBUTION RATE

All authors declare that they have contributed equally to the work.

This study is not under evaluation in another journal.

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