Educational Needs of Chronic Kidney Disease Patients Who Presented to Tengku Ampuan Afzan Hospital: Preliminary Findings

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ABSTRACT. Knowledge limitation is a major cause of the increasing number of chronic kidney disease (CKD) patients in Malaysia and the world. Nurses are responsible for identifying the patients’ needs to come up with appropriate discharge plans which might include educational activities. The objective of this study was to determine the baseline information (socio-demographic background, as well as medical and lifestyle histories), along with educational needs of CKD patients. A total of 116 CKD patients who attended the Nephrology Clinic of Hospital Tengku Ampuan Afzan were recruited. Patients who fulfilled the inclusion criteria were selected between April and May 2017. Data were obtained via semi-guided questionnaires; the patients were given enough time to complete the required items. The CKD educational needs’ assessment consisted of seven domains: general information, chronic illness management, complications, self-management, medications, treatment, and financial status. Majority of the patients were men (53.4%), aged 54.65 ± 16.49 years, secondary school-finishers (49.1%), and jobless (48.3%). In terms of medical and life-style histories, most patients were diagnosed with end-stage renal disease (51.7%), hypertension (96.6%), diabetes (51.7%), and anemia (25.9%). The patients were interested to know the complications of kidney disease (57.8%), management of diseases like hypertension (58.6%),
complications like edema (55.2%), indications for medication (73.3%), self-management or fluid control (37.9%), hemodialysis (37.1%), and financial status (21.6%). Thus, strengthening patient education strategies in the clinics, hospitals, and community settings should be given due attention by relevant healthcare professionals.

Introduction

Kidney disease is the 9th leading cause of death in the United States; almost 26 million American adults are diagnosed with the said disease.1 In Malaysia, more than 5000 new patients are diagnosed with kidney failure every year, and the number of Malaysians who become dependent on dialysis was expected to exceed 30,000 by the end of 2015.1 In 2014, there were 35,580 kidney disease patients on renal replacement therapy (RRT), i.e., either hemodialysis (HD) or peritoneal dialysis (PD).

Chronic kidney disease (CKD) is defined as kidney damage with a glomerular filtration rate of <60 mL/min/1.73 m² for at least three months.2 CKD can progress to end-stage renal disease (ESRD), the final stage of CKD, which requires RRTs like HD, PD, or kidney transplantation. According to Hill et al, cardiovascular disease (CVD) is the primary cause of morbidity and mortality. Meanwhile, CKD is regarded as an accelerator of the risk of CVD and an independent risk factor of CVD events. A CKD patient will usually have multiple comorbidities, including diabetes mellitus, hypertension, and poor CV outcomes. The National Kidney Foundation highlighted that almost 247,000 patients are currently diagnosed with kidney disease, with the most common cause being diabetes followed by hypertension.1

Recently, the Malaysian Ministry of Health (MOH) has announced that the prevalence of ESRD has dramatically increased from 563 per million population in 2014 to 1182 per million in 2016.2 This exerts a big impact on the health-care burden as the MOH is expecting an upward trend in the future.3 Such an occurrence will exacerbate the logistic and welfare issues of the RRT recipients. Therefore, it is important to manage CKD patients with an optimum level of multidisciplinary care to prevent the deterioration of the condition which could lead to ESRD.4 Nevertheless, a globally highlighted issue is the lack of knowledge and awareness among healthcare professionals, health science students, and particularly, CKD patients about the disease.5-7

Several important domains must be emphasized in the delivery of any CKD-related educational content. These domains included the definition, etiology, pathophysiology, stage-wise patient care/management, renal replacement therapies, and vascular access in CKD and ESRD.5 This was supported by several Malaysian researches which have stated that the dietary, fluid, medication, and dialysis compliance rates of patients undergoing HD in Malaysia were poor owing to lack of knowledge of the disease and treatment options, which indirectly contributed to the non-compliant behavior.8-10 A study has analyzed the types of information commonly needed by CKD patients and has developed the first question prompt sheet (QPS) for these patients.11 However, the study had its own limitations since there was no research pertaining to the impact of CKD-QPS utilization on the short-, intermediate-, and long-term health outcomes of the patients.11

The increasing trend of kidney failure raises a question as to whether the current methods of health education are effective for the promotion of public awareness of kidney failure. To date, only one population-based study has been performed to measure the prevalence of CKD on the West Coast of Malaysia.12 However, there are still no reports of education-based researches on CKD. Studies might have been conducted at hospitals or nephrology clinics, but these were still under-reported to date.

Patient education is one of the strategies in the prevention of any disease or to retard the progression of the disease from getting worse. A study highlighted that despite having an audit trails looking on the educational activities initiatives and re-enforcement efforts
with the internal medicine residents and attending staff, major issues related to CKD are not being recognized or addressed. Therefore, an appropriate assessment tool is needed to serve as a checklist before any educational activity or program taking place. Therefore, this study was conducted to provide a baseline data on the educational needs among CKD patients in relation to kidney problems.

Subjects and Methods

This was a cross-sectional survey-based study. The source population comprised patients who attended the Nephrology Clinic of Hospital Tengku Ampuan Afzan (HTAA), Kuantan, Pahang, between April 2017 and May 2017. The inclusion criteria were patients who: (1) had any stage of CKD, (2) were aged at least 18 years, and (3) were able to understand Bahasa Malaysia or English. The patients were excluded from the study if they were foreigners or were currently having physical or severe mental illnesses that restricted their ability to write and answer the questionnaires. Using the Raosoft software, the sample size of the actual study was calculated; at least 150 CKD patients were required when the error margin was 5% and confidence interval 95%. However, to obtain the preliminary findings, 116 (more than 30) CKD patients were recruited, hence fulfilling the minimum sample size as per the central limit theorem.

The respondents were conveniently selected using a nonprobability method. Data were obtained via semi-guided questionnaires and medical reports. The questionnaires consisted of three parts: Part A for sociodemographic details, Part B for medical and lifestyle history information, and Part C for educational needs on CKD (ENCKD). The instruments in Part 3 consisted of seven domains and a total of 22 items which covered general information on CKD, management of the disease or its risk factors, complications, medications, self-care, treatment options, and financial status. All seven domains were rated using a five-point Likert scale which ranged between lowest need to know (1) and highest need to know (5). This was to determine the degrees of importance of the domains with reference to the CKD patients’ opinions.

Based on the literature and one of the author’s expertise in questionnaire development, the instruments in Part C were newly developed by one of the authors under the supervision of a senior researcher. Apart from that, the Clinical Practice Guidelines (CPG) were mainly used to determine the important domains, or ENCKD, to be included in the questionnaire. This was supported and recommended in one of the earlier studies since the CPG contained information that were in accordance with the current clinical evidences that were recognized by the experts. The contents of the questionnaire were validated by two nursing lecturers (i.e., one of the authors with a Master’s degree on renal postbasic (advance diploma) and a patient education expert). As for the reliability test, an internal consistency test was performed on 30 CKD patients who were not related to the study. The Cronbach’s alpha ($\alpha$) was 0.97, which meant that the newly developed instrument had good reliability.

Before data collection, the purpose of the study was explained in detail to the patients and signed consent forms were obtained from them. The questionnaires were then administered on the patients with the provision of adequate time (15–20 min) for them to answer all the items. Throughout the questionnaire-administration process, the researchers were on site to assist the respondents who had difficulty answering the questions. Descriptive analysis of the data was performed using the IBM SPSS Statistics for Windows version 24.0 (IBM Corp., Armonk, NY, USA). Ethical clearance was obtained from the Kulliyyah of Nursing Postgraduate and Research Committee, International Islamic University Malaysia Research Ethics Committee, Medical Research and Ethics Committee of the MOH (ID: NMRR-17-88-34233), as well as Clinical Research Centre of HTAA, Kuantan, Pahang.
Results

Overall, there were 116 CKD patients in the study. The mean age of the CKD patients was 54.65 years; most respondents (47.4%) were more than 59 years (Table 1). The majority of them were male (53.4%), Malays (80.2%), and married (62.1%). Furthermore, they were most likely to be unemployed (48.3%) and secondary school finishers (49.1%) (Table 1).

Table 2 describes the medical and lifestyle histories of the CKD patients. The majority of the patients were diagnosed with ESRD (51.7%). Before the onset of ESRD, these patients had history of hypertension (96.6%), diabetes (51.7%), and anemia (25.9%). Most of them (50.9%) had not undergone dialysis (until they were ordered by their physicians to do so with reference to their eligibility) and were allegedly compliant to their medications (94.0%). In terms of dietary patterns, the majority of them were not on fluid restriction (50.0%) or dietary modifications (50.0%). As for lifestyle, most of them were physically active (62.9%) and nonsmokers (87.1%).

Table 3 shows the CKD-related educational needs from the perspectives of the CKD patients. The first domain describes the educational needs with respect to the general information on CKD. Most of the CKD patients rated “highest need to know” for the complications (57.8%) and symptoms (48.3%) of CKD. Classification of CKD was the least important piece of information needed by the CKD patients (44.8%). The second domain addressed the educational needs based on the management of the comorbidities of CKD. The risk factors that were rated “highest need

| Variables | Frequency (%) |
|-----------|---------------|
| Age (Years) | Mean (SD)  |
| 18–29      | 14 (12.1)    |
| 30–39      | 13 (11.2)    |
| 40–49      | 10 (8.6)     |
| 50–59      | 24 (20.7)    |
| >59        | 55 (47.4)    |
| Gender     | 62 (53.4)    |
| Male       | 54 (46.6)    |
| Race       | 93 (80.2)    |
| Malay      | 22 (19.0)    |
| Indian     | 1 (0.9)      |
| Marital status | 21 (18.1) |
| Single     | 21 (18.1)    |
| Married    | 72 (62.1)    |
| Divorced   | 2 (1.7)      |
| Widow      | 21 (18.1)    |
| Employment status | 56 (48.3) |
| Unemployed | 18 (15.5)    |
| Housewife  | 15 (12.9)    |
| Government | 9 (7.8)      |
| Private    | 18 (15.5)    |
| Retired    | 38 (32.8)    |
| Level of education | 57 (49.1) |
| Primary school | 19 (16.4) |
| Secondary school | 2 (1.7) |
to know” were hypertension (58.6%) and diabetes (44.0%). However, these patients felt they did not need to have knowledge of glomerulonephritis (4.3%), obstructive nephropathy (4.3%), and polycystic kidney disease (4.3%).

The third domain was on the educational needs of the patients in terms of the complications of CKD. The majority of the patients (55.2%) rated “highest need to know” for edema. The fourth domain was about the medications in CKD. The majority of the patients claimed they most needed to know the indications for the medicines prescribed to them (73.3%), but least needed to know the types of medicines (70.7%). The fifth domain...
Table 3. Educational needs pertaining to patients with chronic kidney disease (n=116).

| Domain          | The lowest need to know (1) | Somehow need to know (2) | Not sure (3) | Need to know (4) | The highest need to know (5) |
|-----------------|-----------------------------|--------------------------|--------------|-----------------|-----------------------------|
| General information |                            |                          |              |                 |                             |
| Definition       | 1 (0.9)                     | 32 (27.6)                | 9 (7.8)      | 55 (47.4)       | 19 (16.4)                   |
| Classification   | 1 (0.9)                     | 33 (28.4)                | 11 (9.5)     | 52 (44.8)       | 19 (16.4)                   |
| Causes           | 1 (0.9)                     | 33 (28.4)                | 9 (7.8)      | 55 (47.4)       | 18 (15.5)                   |
| Symptoms         | 1 (0.9)                     | 29 (25.0)                | 10 (8.6)     | 56 (48.3)       | 20 (17.2)                   |
| Complications    | 1 (0.9)                     | 23 (19.8)                | 7 (6.0)      | 67 (57.8)       | 18 (15.5)                   |
| Management disease |                            |                          |              |                 |                             |
| Hypertension     | 2 (1.7)                     | 20 (17.2)                | 7 (6.0)      | 68 (58.6)       | 19 (16.4)                   |
| Diabetes         | 17 (14.7)                   | 22 (19.0)                | 13 (11.2)    | 51 (44.0)       | 13 (11.2)                   |
| SLE              | 47 (40.5)                   | 31 (26.7)                | 29 (25.0)    | 7 (6.0)         | 2 (1.7)                     |
| Glomerulonephritis | 48 (41.4)                   | 30 (25.9)                | 31 (26.7)    | 5 (4.3)         | 2 (1.7)                     |
| Obstructive nephropathy | 48 (41.4)                   | 31 (26.7)                | 30 (25.9)    | 5 (4.3)         | 2 (1.7)                     |
| Polycystic kidney | 48 (41.4)                   | 31 (26.7)                | 31 (26.7)    | 5 (4.3)         | 1 (0.9)                     |
| Hyperlipidemia   | 47 (40.5)                   | 31 (26.7)                | 29 (25.0)    | 8 (6.9)         | 1 (0.9)                     |
| Complications    |                            |                          |              |                 |                             |
| Edema            | 2 (1.7)                     | 18 (15.5)                | 21 (18.1)    | 64 (55.2)       | 11 (9.5)                    |
| Heart disease    | 2 (1.7)                     | 18 (15.5)                | 35 (30.2)    | 52 (44.8)       | 9 (7.8)                     |
| Anemia           | 1 (0.9)                     | 17 (14.7)                | 37 (31.9)    | 52 (44.8)       | 9 (7.8)                     |
| Bone disease     | 1 (0.9)                     | 21 (18.1)                | 44 (37.9)    | 45 (38.8)       | 5 (4.3)                     |
| Hyperparathyroidism | 1 (0.9)                     | 22 (19.0)                | 45 (38.8)    | 42 (36.2)       | 6 (5.2)                     |
| Medications      |                            |                          |              |                 |                             |
| Type of medications | 1 (0.9)                     | 15 (12.9)                | 3 (2.6)      | 82 (70.7)       | 15 (12.9)                   |
| Dosage medications | 1 (0.9)                     | 15 (12.9)                | 2 (1.7)      | 83 (71.6)       | 15 (12.9)                   |
| Indication medications | 1 (0.9)                     | 15 (12.9)                | 2 (1.7)      | 85 (73.3)       | 13 (11.2)                   |
| Side-effect medication | 1 (0.9)                     | 15 (12.9)                | 3 (2.6)      | 84 (72.4)       | 13 (11.2)                   |
| Route administration | 1 (0.9)                     | 15 (12.9)                | 2 (1.7)      | 83 (71.6)       | 15 (12.9)                   |
| Self-care management |                            |                          |              |                 |                             |
| Fluid restriction | 7 (6.0)                     | 20 (17.2)                | 30 (25.9)    | 44 (37.9)       | 15 (12.9)                   |
| Diet modification | 7 (6.0)                     | 21 (18.1)                | 30 (25.9)    | 43 (37.1)       | 15 (12.9)                   |
| Graft, fistula, and catheter | 8 (6.9)                     | 28 (24.1)                | 30 (25.9)    | 35 (30.2)       | 15 (12.9)                   |
| Social relationship | 29 (25.0)                   | 38 (32.8)                | 32 (27.6)    | 16 (13.8)       | 1 (0.9)                     |
| Physical activity | 17 (14.7)                   | 39 (33.6)                | 32 (27.6)    | 26 (22.4)       | 2 (1.7)                     |
| Sexual issues    | 16 (13.8)                   | 37 (31.9)                | 34 (29.3)    | 27 (23.3)       | 2 (1.7)                     |
| Treatment options |                            |                          |              |                 |                             |
| Hemodialysis     | 7 (6.0)                     | 16 (13.8)                | 34 (29.3)    | 43 (37.1)       | 16 (13.8)                   |
| Peritoneal dialysis | 8 (6.9)                     | 44 (37.9)                | 30 (25.9)    | 17 (14.7)       | 17 (14.7)                   |
| Kidney transplant | 8 (6.9)                     | 42 (36.2)                | 45 (38.8)    | 14 (12.1)       | 7 (6.0)                     |
| Financial status  | 9 (7.8)                     | 26 (22.4)                | 50 (43.1)    | 25 (21.6)       | 6 (5.2)                     |

SLE: Systemic lupus erythematosus.

comprised information on the self-care of CKD. Most patients rated “highest need to know” for fluid restriction (37.9%), but they had the least need to know the social relationships (13.8%). The sixth domain described the treatment options for CKD patients. More respondents required knowledge on HD (37.1%) as compared to the other options of treatment. The seventh and last domain was on the informational needs with respect to finan-
cial status, whereby the majority of patients did not have adequate knowledge of the importance of financial assistance in the treatment of CKD.

**Discussion**

There is a lack of evidence on how educational assessments for the management of CKD should be performed. In comparison, stroke management in Malaysia has clear-cut algorithm on patient education by multidisciplinary teams.² In this study, we attempted to determine the types of CKD-related educational needs of the patients who presented to the Nephrology Clinic of HTAA. This was an important undertaking since it might help retard the progression of CKD to ESRD. When continuous education is provided to the patients and their educational needs measured as well as delivered based on the aspects which they feel are important to them, there will be an indirect decrease in the mortality from kidney failure.

In this study, there were more male (53.4%) than female patients (46.6%), and the majority of patients were aged over 59 years (47.4%). Most of them had completed secondary school (49.1%) and were unemployed (48.3%). A previous Malaysian study had similar findings, whereby the majority of their ESRD respondents were Malays (53.6%), males (50.5%), aged over 59 years (35.9%), and unemployed without pension (49.1%).¹⁶ Another local study which supported our findings also highlighted that most of the respondents were married (80.3%), secondary school finishers (51.1%), and unemployed (66.0%).¹⁷

As for medical and lifestyle histories, the majority of patients were diagnosed with ESRD (51.7%), along with comorbidities such as hypertension (96.6%) and diabetes (51.7%). This was supported by the 22nd Report of the Malaysian Dialysis and Transplant Register (2014), where hypertension (18%) and diabetes (61%) were the main causes of renal problems. Most patients in this study had undergone HD (38.8%); this result was similar to one of the studies performed locally, where 66.8% of the respondents underwent HD while only 33.2% underwent PD.¹⁶,¹⁸ This could have been in light of the decisions and prescriptions made by the specialists based on the severity of the disease.

In terms of dietary patterns, most of the respondents were not on fluid intake restrictions and dietary modifications. Caution had to be taken while interpreting these results since the data was self-reported. Underestimates or overestimates might have happened since most of the CKD patients were not familiar with the concept of adherence to fluid and diet restrictions. The reduction of fluid intake was not limited to drinks; it included other fluids such as soups and blended juices as well. This was confirmed by one of the studies, which highlighted that the majority of HD patients in Malaysia had difficulties in complying with the dietary restrictions.¹⁰ During maintenance dialysis, optimal protein and energy intake along with control of hyperphosphatemia had to be attained by means of diet restrictions.¹⁹

Therefore, there was a need to assess the patients’ opinions of their extent of adherence to treatment, which indirectly determined the efficacy of the medical recommendations.²⁰ As per current practices, patients with ESRD have to undergo HD at least three times a week, so it is important to know their educational needs with respect to compliance with dietary and fluid restrictions as well as medications for their co-morbidities. Previous researches highlighted that as many as 81.4% of HD patients had difficulties in complying with the challenging HD dietary restrictions and that 74.6% struggled with HD fluid restrictions.²¹-²³ As per the National Institute for Health and Clinical Excellence (NICE), a key element of the recommended method of CKD management was to offer high-quality education at appropriate stages of a person’s condition to promote the understanding and making of informed choices with regard to treatment.²⁴ It was recommended that information on fluid restriction and dietary modifications should be tailored according to the stage, cause, complications, and risk of CKD progression.

To slow down the progression of early-stage
CKD, dietary modifications that generally target the underlying causes of the disease (e.g., diabetes and hypertension) are required. Two studies have reported that the consumption of diets which were rich in fruits and vegetables helped slow down the progression of CKD. Meanwhile, weight management in CKD patients has been proven to be able to reduce proteinuria, blood pressure, and further decline of renal function. Therefore, assessments on these items might provide important insight into the actual lifestyles adopted by the CKD patients.

With regard to lifestyle patterns, this study revealed that most of the patients were non-smokers (87.1%) and had good levels of physical activity (62.9%); on further questioning, most of them claimed that they only performed household chores. Since, this was a self-reported finding, we believed that our patients remained active despite having CKD. Nevertheless, an overestimation might have occurred. This finding was congruent with a study conducted in the West Coast of Malaysia in which, most of the patients on HD were physically active (i.e., they performed household chores and walked). It is highly recommended for chronic disease patients to stay active in order to stabilize their blood parameters (such as sugar levels and blood pressure) apart from maintaining healthy weights.

Nevertheless, there were findings which contradicted those in the literature. Stack and Murphy found that 75% of dialysis recipients reported limitations in their abilities to engage in vigorous physical activity, while less than half engaged in physical activities more than once per week. Stack et al reported that in the CKD population, limitations in their exercise capacities were associated with an increase in risk of mortality. Even though individuals with ESRD have diminished exercise capacities, it is crucial to note that physical activity can improve their aerobic capacities, physical functions, and health-related quality of life. De Francisco et al found some evidence to suggest that physical activity could play an important role in the prevention of the development of CKD. The benefits of physical activity in the preservation of renal health might be related to its ability to delay the onset of CKD or optimize many chronic conditions such as diabetes, hypertension, and vascular diseases.

The results of the educational needs’ assessments are discussed with respect to the seven domains: general information on CKD, disease management, complications, medications, self-care, treatment options, and financial implications of CKD. In this study, nearly half (57.8%) of the patients expressed that they needed to know the complications of CKD. At the same time, the majority (58.6%) opined that they needed to know the management of hypertension (96.6%), diabetes (51.7%), and anemia (25.9%) for CKD control. This was the main concern of the CKD patients, and the most probable reason for the same was that they were in the later stages of the disease with multiple comorbidities, apart from experiencing certain complications such as anemia which could cause fatigue.

As for the third domain, the patients perceived that it is important to have knowledge on edema, one of the complications of CKD. Interestingly, nearly 70% of the respondents felt that medications were the most important area of CKD to be known, especially the prescriptions as well as their daily dosages and routes of administration. In terms of self-care, the information which were most needed to be known by the CKD patients were fluid (37.9%) and dietary prescriptions (37.1%), as well as catheter, fistula, and graft care (30.2%). Some 37.1% of them required information on HD as well.

The results of this study were supported by those of Lewis et al, which highlighted that the top four types of information requested by the respondents were kidney disease (96%), graft, fistula, and catheter care (83%), treatment options (83%), as well as medications (80%). Another study has also found that knowledge on kidney disease, CKD monitoring, self-care, and kidney failure management were the main elements in patient education. Thus, the patients were keen to update themselves with
knowledge on the management of the disease after being diagnosed as such. In terms of dietary management, a case study on an elderly patient with CKD has highlighted the importance of adequate monitoring of dietary intake, especially in those who were poorly educated or illiterate, and avoid overzealous reductions of protein intake. There is a need to educate the CKD patients on proper diet management since the daily requirement of energy/calories, protein, fat, and fluids differ between those who undergo HD than those who do not, as highlighted by many studies.33-35

Overall, the findings have highlighted the importance of assessments of the education needs of CKD patients. This information would be valuable for the planning of proper education in order to increase the level of knowledge on CKD in the future. This study was among the first to come up with the aspects for measuring the ENCKD patients in the East Coast of Malaysia. Few studies on this topic have been performed, most of which were epidemiological and biomedical-based apart from being conducted in the West Coast.

It is hoped that this study will be able to create awareness in all patients who are at risk of ESRD, particularly if they have poor control of their co-morbidities (e.g., hypertension and diabetes mellitus), following diagnosis of CKD. It is also expected that consistent types of knowledge/information be delivered by the healthcare professionals to the patients in clinical settings to avoid confusion in the latter. These findings can serve as a checklist of educational needs that can be filled up by the CKD patients before consulting their healthcare professionals.

This study was not without its limitations. The first limitation was that this study has been conducted at a single clinic in a government hospital; thus, it did not reflect the overall CKD patient population in Kuantan, Pahang. Second, this study could not determine the cause–effect relationship or confirm that the patients were poorly educated on CKD at the clinic. Nevertheless, this prevalence study did provide good baseline findings on patient education needs. A further limitation of the study was that the comorbidities of the CKD patients might have had an impact on the extent of need for education. Further studies can be carried out to determine the existence of such an association. It is important to recognize that, apart from solely relying on biomedical approaches to achieve the optimal physiological and biochemical parameters in CKD, healthcare professionals should spend more times to educate the patients.

Conclusion

This study has provided baseline information on the ENCKD patients who presented to the Nephrology Clinic of HTAA, Kuantan, Pahang. Although this study did not reflect the overall CKD population in Pahang, the findings have still highlighted the importance of continuous effective patient education. There should be a focus on the complications of CKD and its symptoms, especially among those who are having multiple comorbidities such as hypertension and diabetes. This is to enhance the CKD patients’ understanding and knowledge on the importance of compliance with medications and self-care, especially in terms of fluid restriction and adherence to HD schedules. In terms of social responsibilities, financial assistance should be regarded as a possible predisposing factor for the noncompliance among the CKD patients. Further replications of this study with larger sample sizes should be carried out to confirm the significance of the relationship between sociodemographic aspects, comorbidities, and ENCKD patients.

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